

# A Review of Corporate Hedging Models and Their Relevance in Corporate Finance

Pankaj Gupta

Indian Institute of Management, Indore, India

Email: f11pankajg@iimdr.ac.in

**How to cite this paper:** Gupta, P. (2017) A Review of Corporate Hedging Models and Their Relevance in Corporate Finance. *Theoretical Economics Letters*, 7, 102-115. <https://doi.org/10.4236/tel.2017.72010>

**Received:** November 24, 2016

**Accepted:** January 31, 2017

**Published:** February 3, 2017

Copyright © 2017 by author and Scientific Research Publishing Inc. This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

<http://creativecommons.org/licenses/by/4.0/>



Open Access

---

## Abstract

In this paper, a review of theoretical literature of models providing rational of corporate hedging is done and also addresses the corporate finance issues such as financing and investment. As per definition, hedging is either an insurance contract or an activity reducing the correlation between value and random variable linked with the derivative purchase. It is found that, when considering the modern finance theory after relaxing the assumptions made by Modigliani & Miller, the corporate hedging reduces several costs such as agency cost, distress cost and cost of debt. Also, hedging models are explained reducing the adverse selection problem. An integrated approach based models are also present in the review.

## Keywords

Corporate Hedging Models, Capital Structure, Investment Decision

---

## 1. Introduction

Corporate risk management is one of the most important concerns of executives and investors [1] [2]. Corporate risk management primarily relies on corporate hedging activity either through holding derivatives or taking positions to offset the potential losses due to adverse movement in underlying assets. This paper reviews various theoretical and empirical studies providing economic rationales for the corporate hedging activity by non-financial firms. Unlike several studies [3], [4] and [5] on hedging in the financial market for financial institutions, this study focuses only on risk neutral non-financial firm. A staged progression in assuming firms from risk-averse to risk neutral is evident in literature and, this study avoids assumption of risk aversion. Literature defines corporate hedging as an activity of holding financial derivatives or purchasing an insurance contract [6].

Further, the literature on corporate hedging models is built upon theoretical premises of [7], [8] and [9]. According to which, every hedging model is developed when relaxes any of the assumptions of [7] [8] and follows contracting relationship theories for diffused ownership firms as initiated by [9]. Based on theoretical models, corporate hedging activity is value additive as this reduces the financial distress cost, tax liability, information asymmetry and cost of debt on one hand, while, solves the moral hazard problem on another hand. Further, the development of theoretical literature of hedging at firm level is till the year 2000 beyond which, maximum empirical studies obtained. These studies have their own limitations and boundaries. Empirical literature tests various hypotheses as promulgated in theoretical literature and considers one aspect or combinations in integrated form. I include these studies later in separate section and highlight their limitations in different perspectives and boundaries especially, for emerging economies like India.

Further, the paper is organized as follows: Section 2 highlights the theoretical perspective of corporate hedging studies in finance and economic literature; Section 3 distinguishes between different definitions of corporate hedging available in the literature; Section 4 presents an overview of various theoretical models describing corporate hedging as value enhancing arising from financial market imperfections; Section 5 reviews various empirical studies done so far on theoretical models and identifies possible limitations of research on corporate hedging in India and Section 6 concludes.

## 2. Corporate Hedging: Theoretical Perspectives and Developments

Theoretical literature on corporate risk management mainly emerges in 1980s concentrating on both the finance and economics literature equally through the findings for capital structure theory initiated by [7] [8] and Fisher separation theorem given by [10]. Fisher separation theorem tells us that profit maximization is an ultimate objective of the firm. Fisher separation theorem states that the investment decision is independent of financing decisions. In this view, profit maximization is the main objective of the firm and to achieve this objective, control shift totally in the hands of managers and excessive risk taking by managers to provide profit to the shareholders is plausible. In such situations, the risk management is irrelevant for shareholders as their main concern is profit. So this theory states the notion that a firm's choice of investments is separate from its owner's attitudes toward investments. Finance theory considering Modigliani-Miller (M-M) theorem, suggest that shareholder's wealth maximization is an ultimate goal of the firm and capital structure does not matter for a firm's value point of view ([7]: p. 268). In this way, shareholders are indifferent to a firm's financial policy. Keeping this in view, shareholders would be diversifying the unsystematic risks and may demand a risk premium for systematic risks only, *i.e.* unsystematic risk will not add value to the firm (Irrelevance). So the question is—where does hedging come into play? These two theories assume

frictionless world which is far from reality. In Corporate finance theory, hedging helps to reduce various costs and increases the firm's value. This hedging irrelevance view is negated by several studies through reducing several costs. This increases the firm value and is called as value perspective. Latest studies demonstrate that value is increased through lowering the interest rate spread [11], managing foreign currency risk [12], increasing debt capacity [13] and reduction in systematic risk [14]. The value based perspective considers reducing several costs which we discuss in the next Section 4. Hedging is also viewed as solving the moral hazard issues such as agency conflict between shareholder-manager, information asymmetry and adverse selection issues. This perspective is also described later in Section 4. Hedging is the part of firm's corporate risk management program and is straightforward when relaxing the assumptions of M-M world. A study by [15] found similarity of holding a hedge portfolio with changes in financial policy altering the statistical distribution of cash-flow to the shareholders. Also, purchase of insurance contract considering the financial policy of firm provides similar risk management benefits [16]. In continuous framework, firms' adopt hedging policies to maximize the value of firm [17].

Unlike managerial risk aversion assumptions for risk management of individuals, managing risk at firm level considers the risk neutral view and follows several different motivations. The first formal theoretical study by [18] provides value maximizing view through examining the tax advantages, contracting costs and transaction costs as similar with [16]. A study by [19] provides a theory stating that, firms' hedge more to lower the tax credits or depreciation and hence increases the value of the firm. Initially, the literature for managing the risk faced by a firm considers purchasing a corporate insurance [20] [21] which later was taken by others through focusing on corporate hedging and selective hedging issues [17] [18]. Recent studies focus on both these activities together depending upon the nature of risk and cash flow status of the firm [22]. On the one hand, [18] focuses on separation theorem; while, on the other hand, [19] shows that separation no longer exist when appropriate compensation is provided. Another seminal work by [23] introduces the solution to underinvestment problem through improving contracting term and reducing agency cost after hedging in a widely held firm. Information asymmetry issues as part of the contacting terms also provide rationales for hedging and speculation [24] [25] [26]. Another important contribution by [27] is the reduction of variability in the internal funds through hedging and thus reducing dependency on costlier external finance.

By this time, capital structure is given *ex-ante* and no study considers the changes in capital structure due to the risk management at firm level. Seminal work by [28] provides joint analysis of determination of agency cost and *ex-post* capital structure due to hedging. Later, models develop focusing on managerial stock options, market power of firm, moral hazard, and overinvestment problems [29] [30] [31] [32]. The authors have replaced theoretical models of corporate hedging through using numerical simulation models or infinite horizon,

continuous time dynamic models [33] [34]. Theoretical models were integrated together after following the simultaneous equation approach and counters previous arguments [35] [36] [37]. In this way, literature on corporate hedging models initially provides theoretical aspects explaining linkages with modern corporate finance theory, which, in recent is replaced by computational models. Whether the superiority in computation has enriched the literature or not is debatable but, is not the focus of this study.

### 3. Corporate Hedging: Different Definitions

Literature provides three different definitions of corporate hedging—i) An insurance contract; ii) Any action reducing covariance between a firm's value and factors causing imperfections and iii) An activity of holding financial derivatives to reduce the exposure to marketable risks.

#### 3.1. Hedging as an Insurance Contract

A study by [16] endeavored first to define hedging as an insurance contract. Further, this study defines hedging as buying an insurance contract because buying an insurance contract provides some incentives like allocation of risk, lowering transaction costs, claim monitoring, tax advantages etc. Purpose of [16] work was to analyze the set of incentives, consistent with the modern theory of finance, which motivated the purchase of insurance policies by corporations. Further, [16] also argue that, the demand for the purchase of an insurance contract is deriving from the ability of an insurance contracts to 1) Allocate risk to those of the firm's claim holders who have a comparative advantage in risk bearing, 2) Reduce the expected transaction cost of bankruptcy, 3) Provide real-service efficiency in claims administration, 4) Monitoring the compliance of contractual provisions, 5) Bond the firm's real investment decisions, 6) Reducing the corporation's expected tax liability, and 7) Reducing regulatory constraints on firms. So these incentives by purchasing an insurance contract will lower the risk exposure and thus enhances the value of the firm.

A research study by [26] presents a model of hedging after viewing asymmetric information. It was stated in this study that managers' use hedging as an indirect vehicle to communicate their abilities. The results of this study indicate that hedging occurs when higher ability managers are substantially different from lower ability managers or the costs of hedging are low. This study substantiates the causal belief that hedging locks up higher profit opportunities in the same way that an arbitrageur locks up arbitrage opportunities. Further, subsequent researches treat the activity of hedging as insurance contracts to mitigate the risk. A study by [38] describes insurance losses as a signaling device to reduce the information asymmetry (Rebello, 1995). In the study by [39] a basic adverse selection model is present, which stated that, it is beneficial to insure against bad outcomes and thereby improving credit quality and reducing cost of capital. Reducing the cost of capital (discount rate) will increase in value and thus insurance can be used as hedging instruments.

### 3.2. Hedging as Reducing Covariance

Seminal study by [18] provides a general definition of hedging in his most admired paper on corporate risk management. This work develops a positive theory of hedging behavior for value maximizing firms by giving, an analysis and this work was very different from the literature available during that time. This was stated that, rather assuming that the firm is risk averse; assume that incentives exist within the contracting process to maximize the market value of the firm. This study shows that a value-maximizing firm can hedge for three reasons: 1) taxes, 2) costs of financial distress, and 3) managerial risk aversion. This work offers a framework within which various hedging practices under corporate finance theory can be understood.

The definition given by seminal work [18] is different from work done by [16]. In later one, risk is assessing and hedge through an insurance contract, which is a sophisticated and professional assessment of risks, whereas in the former work, hedging through forwards or futures contract provides us no apparent real services<sup>1</sup>.

In research study by [40], stock option for managers as compensation enhances the value. It further explains that hedging via insuring pure risk is better than hedging corporate risk via purchasing forward contracts. Further, insurance reduces the over investment problem but this does not provide the limits of reduction in investment to maximize the value.

A corporate risk management program for a firm is easy to understand and drawn upon once understood various rationales explained by [18]. One may also compare the fundamental differences of corporate hedging rationale among firms. For example—Airlines company and electricity production firm both are depending upon the fuel (coal and gasoline) but the nature of uncertainty motivates a managers to adopt different way of hedging its risk.

The demand for corporate insurance to hedge risks has certain advantages like lowering the bankruptcy cost, tax burden, and real investment issues [16]. Also a reduction in agency and bankruptcy cost is evident in theoretical model of [19] when considers the hedging as corporate insurance. Further, an information signaling model [38] and the adverse selection model [39] suggest hedging as purchase of insurance. When comparison between hedging and insurance contract is done the preference is given to the insurance contract from value perspective [40].

### 3.3. Hedging as Holding Financial Derivatives

Several studies such as [26] [27], and [41] [42] have defined hedging as holding the derivative instruments to reduce the covariance between firm's value and value of an underlying asset subject to market fluctuations (interest rate and exchange rates). This definition is different from as explained by general definition by [18]. When we talk about holding financial derivatives authors are interested in investigating the effects of linear vs. non-linear instruments [26]. Further, au-

<sup>1</sup>See ([18]: p. 391, note 3).

thors defining hedging as holding the derivatives are also interested in the effect of linear vs. non-linear hedging<sup>2</sup>.

The definition of hedging as holding financial derivatives does not include information asymmetry and moral hazard problems. Hedging as holding derivative instruments may investigate the effects of having different derivatives instruments in a firm's portfolio.

#### **4. Theoretical Rationale of Corporate Hedging Models: A Value Increasing Activity**

The study by [18] first derives rationale for hedging from imperfect capital market and thus rejects Modigliani-Miller's irrelevance theorem. After this work, entire perspective is change and instead of considering the assumption of risk aversion, researchers are working in this area by assuming risk neutrality<sup>3</sup>. Further, as to maximize shareholder's wealth some of the models including [18], share a common view that corporate hedging increases the expected value of a risk neutral firm and market imperfections make the value function a concave function of state contingent variables. Considering this, some of those imperfections taken by researchers and rationales for hedging are given below.

##### **4.1. Corporate Hedging and Moral Hazard Issue**

Fisher separation theorem states that the ultimate objective of the firm is profit maximization and therefore, managers' production opportunities and shareholder's market opportunities are separate from each other. In essence, investment decisions and finance decisions are distinctive. Further, in uncertain environment, shareholder's delegates authority to the managers to maximize their wealth. In corporate finance literature, there are several contributions based on settings where shareholders cannot monitor the managers, *i.e.* the information asymmetry and agency cost comes into play. Managers take the private benefit of this asymmetry and thus are in conflict with the shareholder's interest. Literature provides us guidance that, as a part of managers own interest corporate hedging decision are taken, which contradicts the Fisher separation theorem. In this way, this theorem is counterfeit by many authors.

##### **4.1.1. Agency Problem**

Corporate risk management describes agency problem extensively. The seminal work by [18] addressed the agency problem issue by compensating them in such a way so that they may be motivated to maximize the value of the firm. Further, this study stated that, if the managers own the portion of total pie then it is expecting that the firm hedge more. The study highlights the reason to hedge by relating the manager's compensation linearly with the value of the firm through

<sup>2</sup>See the study by [26] (pp. 1645-1647). This study explains the effects of linear vs. nonlinear hedging *i.e.* using futures and forward vs. options.

<sup>3</sup>Before this work hedging models were present by assuming risk aversion hypothesis for a firm. See Examples of studies that assume risk averse firm are earlier models such as [43] [44] [45] [46] and [47].

stating that, “Therefore compensation to the managers must be designed in such a way so that when managers increase the value of the firm, they also increase their expected utility<sup>4</sup>”.

A study by [40] analyzes stock option incentives compensated to managers to behave and concludes that, managers behave to maximize stock option value. To hedge the firm’s risk, managers have one choice out of forward contract or insurance contract and they opt for insurance contract. Insurance contract outlines some benefits over forward contract. [48] analyzed investment decisions made by managers in the light of agency costs and discretion to hedge the future risk of the firm. He further states that rather focusing on the present value of cash flows it is the distribution of cash flow that matters and further provides a rationale for policies that reduces cash-flow volatility *i.e.* rationale for corporate hedging.

#### **4.1.2. Adverse Selection and Signaling Problem**

Firm’s quality and its signaling issues are addressed in early studies [49] [50] [51] [52]. Further, the studies by [38] and [39] build models of adverse selection including hedging as signaling instrument. Study by [51] emphasized the importance of information asymmetry and signaling problems for participants in financial markets. A firm’s quality is signal through the revenues and investments in the risky projects. Therefore, the manager’s objective is to maximize the value for equity holders of choosing the optimal level of security designed for its’ hedging policy and expected cash inflow.

The study by [38] explains the adverse selection of purchasing insurable risk and thereby preference towards equity or debt. He discussed two extremes of purchasing insurance risk. In full insurance risk increased insurance coverage offsets adverse selection costs result due to information asymmetry regarding cash flows. [39] presents simple adverse selection model in which firm finds it advantageous to insure against bad outcomes and thereby improve its credit quality and reduce its cost of capital. Here literature gives us insights, to design the compensation package of a manager in a manner so that, it induces him to maximize his profit function and consequently, firm’s expected utility function is optimum.

#### **4.2. Expected Tax Rate**

The study by [18] proposed a model (rationale for hedging) to maximize the post-tax value of the firm and said that post-tax value function is a concave function of its pre-tax value. Another study [19] also studied the tax implications, demonstrating a firm hedging its production decision or tax credits to increase its value. How does the way by which hedging works here? It is given in [18] that when cost of hedge is not included, a firm’s marginal tax rate is an increasing function firm’s pre-tax value, then the expected corporate tax liability is reduced and expected post-tax value of firm is increased. When hedging cost is

---

<sup>4</sup>See ([18]: p. 399).

included, value of firm increases till cost of hedging is less than benefits obtained. There can be some other possibilities depending upon the shape of tax as function of cash flow.

### 4.3. Costs of Financial Distress

Cost of financial distress leads to hedging<sup>5</sup>. This argument is supporting for non-financial firm as well *i.e.* transaction costs of distress motivate a widely held firm to hedge. Study [18] states that if a transaction cost of bankruptcy is a decreasing function of firm value, and the tax rate is either constant or an increasing function of firm value, expected after-tax firm value net of bankruptcy costs is higher if the firm can hedge costless. Further, this study proposed a framework within which hedging can reduce the firm's financial distress by reducing the probability of bankruptcy for the firm. In this way, rationale of hedging points us towards the conflict of interest between shareholders and bondholders. Previous researches to [18] show that, shareholders have an incentive to increase the riskiness of a project even after bond is issued and priced<sup>6</sup>. As mentioned above, hedging increases expected value but redistributes wealth from shareholders to bondholders by reducing probability of bankruptcy and thus cost of bankruptcy. As this bankruptcy cost is borne by bond-holders. Therefore, reduction in cost results an increase in value for bondholders. Although, [18] clarifies this problem by stating that a promise to hedge after issuing the debt is not credible as it is not in the stockholder's interest. Further, empirical researches by [53] & [54] gave possibilities of reverse hedging (speculation). Speculation increases riskiness and thus redistributes wealth to shareholders. The study [18] could not identify this possibility during his time and, still theoretical backing for reverse hedging is required.

In a recent theoretical contribution by [55], examines the contribution of hedging to firm value and the cost of hedging in a unified framework. They model a firm which raises its equity value by reducing the bankruptcy cost. Further this study considers the hedging cost in optimal hedging framework and assumes default risk.

### 4.4. Cost of External Finance

In [27], under fixed investment model, corporate hedging supersedes gambling as an entrepreneur is indifferent between these two. On the similar lines, [56] stated that, "when agency cost is linear in investment, hedging is optimal for concave production function (risk averse) while gambling is optimal if indivisibility of investment is present, which does not allow investors to get threshold cash on hand". Further, [56] states that, in variable investment model entrepreneur is indifferent between hedging and gambling and prefers hedging (gam-

<sup>5</sup>Diamond also argues that bankruptcy costs lead to hedging. In his model of financial intermediaries, financial intermediaries hedge all systematic risks, *i.e.*, all risks that have no Incentive effects. His inclusions are stronger than [18] study because in his model there are no cases in which it does not pay to hedge, either because of transaction costs or for other reasons discussed in this paper.

<sup>6</sup>See the studies [9], [57], and [58].



bling) if the private benefit is convex (concave) instead of linear in investment.

Further, regarding investment decisions of firms, [59] presented a model and addressed the link between capital structure, investment and risk management. Other models given by [23] [27] investigate the link between capital structure, hedging and investment. [23] presents a model which depicts hedging as value enhancing as it reduces agency cost, have independent effects on investment and improves contracting terms, thus, bounds equity holders to undertake additional positive NPV projects.

A study by [27] investigated the link between investment and risk management under costly external finance. This paper also states the rationale for hedging—“without hedging, firms may be forced to under invest in some settings because it is costly to raise external finance ([27]: p. 1633). This study details about the risk management and financial structure in a sequential contracting context/settings. The first basic setting given is—for a firm facing investment and financing decision with costly external finance. Here in this setting when our internal funding is prone to some risk/random shock/random cash flow then risk management decision is to be taken whether to hedge or not for these fluctuations under given investment and financing constraints. Second setting introduces hedging in optimal contracting condition *i.e.* optimal solution of the behavior of rational managers in this framework. The Third basic setting relates optimal hedging, when either investment opportunity or financing opportunity changes. As explained above, in varying investment conditions, the entrepreneur is indifferent between hedging and gambling. Further, this setting describes the need for full hedging or partial hedging or not hedging as special cases. Here hedging strategy depends upon the coefficient of relationship internal funds and investment (financing) opportunity [27].

#### 4.5. Integrated Approach

Some authors have integrated different approaches and give theoretical models (rationales) for hedging. [48] and [50] considered tax and financial distress approaches to provide rationale for hedging by stating that hedging, on one hand, reduces the probability of financial distress while, on the other hand, it increases debt capacity and interest deductions. Studies such as [28] [60] explain about integrating tax motivations, financial distress and agency cost motivations and provides the rationale for hedging. The study by [28] states to determine capital structure and investment risk altogether. The study provides model to examine hedging the optimal firm decisions and provide quantitative guidance to decide the amount and maturity of debt on financial re-structuring and firm's optimal risk strategy. This paper also challenged some conventional thoughts regarding agency cost and hedging. In this way reviewing the literature under this head gives us insights that in imperfect market condition Modigliani and miller's theorem does not hold good. Also, corporate hedging in finance theory functions as affecting the imperfections (assumptions of M-M hypothesis) in such a way that a change in any one or more than one of them affects the cost of capital and thus value of the firm.

## 5. Empirical Studies Confirming Theoretical Models and Limitations of Research in India: A View Point

There are several studies published recently which empirically verifies theoretical rationales of hedging. A recent research by [11] confirms that hedging reduces the financial distress cost and tax that ultimately increases the investment and financing efficiency of firms. Firms are less prone to file bankruptcy when manage currency exposure [61] [62]. A study by [35] hints leverage as having endogenous effect on hedging and [63] studies the interaction between corporate hedging and liquidity. Study by [64] estimates effect of corporate governance and [65] confirms the positive effect of hedging on value of the firm. A study for firms in Turkey negates any relationship between hedging and firm value [66].

The empirical research for the evidence of corporate hedging in India is very limited. This is due to several limitations. As per my understanding, limited data availability is one of the foremost reasons. A recent study by [67] highlights some of the challenges of measure exposure and hedging in case of India. Firms use forwards and options as preferable short term hedging tools and swaps as long term hedging tools [68]. Most of the available studies focus only on foreign exchange risk as to hedge. The exposure to currency risk is basically due to central banks action and bank intervention matters to estimate the hedging behavior of firms [69]. Study by [69] estimated the currency exposure to firms is dependent on the implicit guarantees made by the central bank. Except, currency risk exposure and its normative description, I have seen none of the study which provides explanations of theoretical rationales unlike study by [11]. A study recently done by [70] establishes a positive relationship between hedging and leverage which ultimately found to increase the value of firm in India.

## 6. Conclusion

As part of conclusion, this literature review provides insights of theoretical models (rationales) for corporate hedging developed so far and answers why a non-financial firm decides to hedge. Corporate hedging has a number of alternatives and is suitable for different firms in different contexts. Earlier when hedging rationales were not given for finance theory, M-M theory and Fisher separation theory explained the relationship between managers and shareholders and thus, value maximization concept was defined accordingly (based on certain assumptions), but after Myers and Smith [52], the entire paradigm changes today. The need for incorporating risk management techniques was sought after this work and it helped us to model the capital structure by including corporate hedging in the model. This review provides us with insights, to focus on reducing risk in imperfect market conditions under risk aversion (concave value function), and is an explanation of the failure of Modigliani's irrelevance theorem and Fisher's separation theorems. The literature reviewed here considered hedging mostly, as a tool to determine the optimal financial structure for a firm and only few have focused on both the investment and capital structure. In all these approaches, the common issue is to find the inter-link between real and financial decision

under uncertainty. In this way, corporate finance theory cannot be separated from economic literature, and macroeconomic variables have to be taken into consideration while doing empirical investigation and describing financial and investment decision for a firm. Further, the empirical evidence of corporate hedging behavior in Indian setting is limited and needs to be investigated by researchers.

## References

- [1] Rawls, S.W. and Smithson, C.W. (1990) Strategic Risk Management. *Journal of Applied Corporate Finance*, **2**, 6-18. <https://doi.org/10.1111/j.1745-6622.1990.tb00183.x>
- [2] Froot, K.A. (1995) Incentive Problems in Financial Contracting: Impacts on Corporate Financing, Investment, and Risk Management Policies. Harvard Business School Press, Boston, Massachusetts, 225-261.
- [3] Diamond, D.W. (1984) Financial Intermediation and Delegated Monitoring. *The Review of Economic Studies*, **51**, 393-414. <https://doi.org/10.2307/2297430>
- [4] Merton, R.C. and Perold, A. (1993) Theory of Risk Capital in Financial Firms. *Journal of Applied Corporate Finance*, **6**, 16-32. <https://doi.org/10.1111/j.1745-6622.1993.tb00231.x>
- [5] Froot, K.A. and Stein, J.C. (1998) Risk Management, Capital Budgeting, and Capital Structure Policy for Financial Institutions: An Integrated Approach. *Journal of Financial Economics*, **47**, 55-82. [https://doi.org/10.1016/S0304-405X\(97\)00037-8](https://doi.org/10.1016/S0304-405X(97)00037-8)
- [6] Rochet, J.C. and Villeneuve, S. (2004) Liquidity Risk and Corporate Demand for Hedging and Insurance. CEPR Discussion Paper No. 4755.
- [7] Modigliani, F. and Miller, M.H. (1958) The Cost of Capital, Corporation Finance and the Theory of Investment. *The American Economic Review*, **48**, 261-297.
- [8] Modigliani, F. and Miller, M.H. (1963) Corporate Income Taxes and the Cost of Capital: A Correction. *The American Economic Review*, **53**, 433-443.
- [9] Jensen, M.C. and Meckling, W.H. (1976) Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure. *Journal of Financial Economics*, **3**, 305-360. [https://doi.org/10.1016/0304-405X\(76\)90026-X](https://doi.org/10.1016/0304-405X(76)90026-X)
- [10] Fisher, I. (1930) *The Theory of Interest*. New York, 43.
- [11] Campello, M., Lin, C., Ma, Y. and Zou, H. (2011) The Real and Financial Implications of Corporate Hedging. *The Journal of Finance*, **66**, 1615-1647. <https://doi.org/10.1111/j.1540-6261.2011.01683.x>
- [12] Allayannis, G. and Weston, J.P. (2001) The Use of Foreign Currency Derivatives and Firm Market Value. *Review of Financial Studies*, **14**, 243-276. <https://doi.org/10.1093/rfs/14.1.243>
- [13] Graham, J.R. and Rogers, D.A. (2002) Do Firms Hedge in Response to Tax Incentives? *The Journal of Finance*, **57**, 815-839. <https://doi.org/10.1111/1540-6261.00443>
- [14] Carter, D.A., Rogers, D.A. and Simkins, B.J. (2006) Does Hedging Affect Firm Value? Evidence from the US Airline Industry. *Financial Management*, **35**, 53-86. <https://doi.org/10.1111/j.1755-053X.2006.tb00131.x>
- [15] Hommel, U. (2005) Value-Based Motives for Corporate Risk Management. In: Michael, F., Ulrich, H. and Markus, R., Eds., *Risk Management*, Springer, Berlin, 455-478. [https://doi.org/10.1007/3-540-26993-2\\_23](https://doi.org/10.1007/3-540-26993-2_23)
- [16] Mayers, D. and Smith Jr., C.W. (1982) On the Corporate Demand for Insurance. *Journal of Business*, **55**, 281-296. <https://doi.org/10.1086/296165>

- [17] Stulz, R.M. (1984) Optimal Hedging Policies. *Journal of Financial and Quantitative Analysis*, **19**, 127-140. <https://doi.org/10.2307/2330894>
- [18] Smith, C.W. and Stulz, R.M. (1985) The Determinants of Firms' Hedging Policies. *Journal of Financial and Quantitative Analysis*, **20**, 391-405. <https://doi.org/10.2307/2330757>
- [19] MacMinn, R.D. (1987) Forward Markets, Stock Markets, and the Theory of the Firm. *The Journal of Finance*, **42**, 1167-1185. <https://doi.org/10.1111/j.1540-6261.1987.tb04359.x>
- [20] Main, B.G. (1982) Business Insurance and Large, Widely-Held Corporations. *Geneva Papers on Risk and Insurance*, **7**, 237-247. <https://doi.org/10.1057/gpp.1982.14>
- [21] Main, B.G. (1982) The Firm's Insurance Decision. Some Questions Raised by the Capital Asset Pricing Model. *Managerial and Decision Economics*, **3**, 7-15. <https://doi.org/10.1002/mde.4090030104>
- [22] Rochet, J.C. and Villeneuve, S. (2011) Liquidity Management and Corporate Demand for Hedging and Insurance. *Journal of Financial Intermediation*, **20**, 303-323. <https://doi.org/10.1016/j.jfi.2010.11.001>
- [23] Bessembinder, H. (1991) Forward Contracts and Firm Value: Investment Incentive and Contracting Effects. *Journal of Financial and Quantitative Analysis*, **26**, 519-532. <https://doi.org/10.2307/2331409>
- [24] DeMarzo, P.M. and Duffie, D. (1991) Corporate Financial Hedging with Proprietary Information. *Journal of Economic Theory*, **53**, 261-286. [https://doi.org/10.1016/0022-0531\(91\)90156-X](https://doi.org/10.1016/0022-0531(91)90156-X)
- [25] Ljungqvist, L. (1994) Asymmetric Information: A Rationale for Corporate Speculation. *Journal of Financial Intermediation*, **3**, 188-203. <https://doi.org/10.1006/jfin.1994.1003>
- [26] Breeden, D. T. and Viswanathan, S. (1998) Why Do Firms Hedge? An Asymmetric Information Model. *The Journal of Fixed Income*, **25**, 7-25. <https://doi.org/10.3905/jfi.2016.25.3.007>
- [27] Froot, K.A., Scharfstein, D.S. and Stein, J.C. (1993) Risk Management: Coordinating Corporate Investment and Financing Policies. *The Journal of Finance*, **48**, 1629-1658. <https://doi.org/10.1111/j.1540-6261.1993.tb05123.x>
- [28] Leland, H.E. (1998) Agency Costs, Risk Management, and Capital Structure. *The Journal of Finance*, **53**, 1213-1243. <https://doi.org/10.1111/0022-1082.00051>
- [29] Bena, J. (2006) Choice of Corporate Risk Management Tools under Moral Hazard. No. 24518, London School of Economics and Political Science, LSE Library.
- [30] Carpenter, J.N. (2000) Does Option Compensation Increase Managerial Risk Appetite? *The Journal of Finance*, **55**, 2311-2331. <https://doi.org/10.1111/0022-1082.00288>
- [31] Downie, D. and Nosal, E. (2003) A Strategic Approach to Hedging and Contracting. *International Journal of Industrial Organization*, **21**, 399-417. [https://doi.org/10.1016/S0167-7187\(02\)00039-5](https://doi.org/10.1016/S0167-7187(02)00039-5)
- [32] Morellec, E. and Smith, C.W. (2007) Agency Conflicts and Risk Management. *Review of Finance*, **11**, 1-23. <https://doi.org/10.1093/rof/rfm001>
- [33] Fehle, F. and Tsyplakov, S. (2005) Dynamic Risk Management: Theory and Evidence. *Journal of Financial Economics*, **78**, 3-47. <https://doi.org/10.1016/j.jfineco.2004.06.013>
- [34] Spanò, M. (2004) Determinants of Hedging and Its Effects on Investment and Debt. *Journal of Corporate Finance*, **10**, 175-197. [https://doi.org/10.1016/S0929-1199\(02\)00037-8](https://doi.org/10.1016/S0929-1199(02)00037-8)

- [35] Dionne, G. and Triki, T. (2013) On Risk Management Determinants: What Really Matters? *The European Journal of Finance*, **19**, 145-164. <https://doi.org/10.1080/1351847X.2012.664156>
- [36] Kuersten, W. and Linde, R. (2011) Corporate Hedging versus Risk-Shifting in Financially Constrained Firms: The Time-Horizon Matters! *Journal of Corporate Finance*, **17**, 502-525. <https://doi.org/10.1016/j.jcorpfin.2011.02.002>
- [37] Lin, C.-M. and Smith, S.D. (2007) Hedging, Financing and Investment Decisions: A Simultaneous Equations Framework. *Financial Review*, **42**, 191-209. <https://doi.org/10.1111/j.1540-6288.2007.00167.x>
- [38] Rebello, M.J. (1995) Adverse Selection Costs and the Firm's Financing and Insurance Decisions. *Journal of Financial Intermediation*, **4**, 21-47. <https://doi.org/10.1006/jfin.1995.1002>
- [39] Huberman, G. (1997) Corporate Risk Management to Reduce Borrowing Costs. *Economics Letters*, **54**, 265-269. [https://doi.org/10.1016/S0165-1765\(97\)00036-0](https://doi.org/10.1016/S0165-1765(97)00036-0)
- [40] Han, L.M. and MacMinn, R. (2006) Stock Options and the Corporate Demand for Insurance. *Journal of Risk and Insurance*, **73**, 231-260. <https://doi.org/10.1111/j.1539-6975.2006.00172.x>
- [41] Broll, U. and Eckwert, B. (1999) Exports and Indirect Hedging of Foreign Currency Risk. *Japanese Economic Review*, **50**, 356-362. <https://doi.org/10.1111/1468-5876.00124>
- [42] Neuberger, A. (1999) Hedging Long-Term Exposures with Multiple Short-Term Futures Contracts. *Review of Financial Studies*, **12**, 429-459. <https://doi.org/10.1093/revfin/12.3.0429>
- [43] Johnson, L.L. (1960) The Theory of Hedging and Speculation in Commodity Futures. *The Review of Economic Studies*, **27**, 139-151. <https://doi.org/10.2307/2296076>
- [44] Stein, J.L. (1961) The Simultaneous Determination of Spot and Futures Prices. *The American Economic Review*, **51**, 1012-1025.
- [45] Rolfo, J. (1980) Optimal Hedging under Price and Quantity Uncertainty: The Case of a Cocoa Producer. *The Journal of Political Economy*, **88**, 100-116. <https://doi.org/10.1086/260849>
- [46] Anderson, R.W. and Danthine, J.P. (1981) Cross Hedging. *The Journal of Political Economy*, **89**, 1182-1196. <https://doi.org/10.1086/261028>
- [47] Marcus, A.J. and Modest, D.M. (1984) Futures Markets and Production Decisions. *The Journal of Political Economy*, **92**, 409-426. <https://doi.org/10.1086/261234>
- [48] Stulz, R. (1990) Managerial Discretion and Optimal Financing Policies. *Journal of Financial Economics*, **26**, 3-27. [https://doi.org/10.1016/0304-405X\(90\)90011-N](https://doi.org/10.1016/0304-405X(90)90011-N)
- [49] Akerlof, G.A. (1970) The Market for "Lemons": Quality Uncertainty and the Market Mechanism. *The Quarterly Journal of Economics*, **84**, 488-500. <https://doi.org/10.2307/1879431>
- [50] Ross, S.A. (1977) The Determination of Financial Structure: The Incentive-Signaling Approach. *The Bell Journal of Economics*, **8**, 23-40. <https://doi.org/10.2307/3003485>
- [51] Brealey, R., Leland, H.E. and Pyle, D.H. (1977) Informational Asymmetries, Financial Structure, and Financial Intermediation. *The Journal of Finance*, **32**, 371-387. <https://doi.org/10.1111/j.1540-6261.1977.tb03277.x>
- [52] Myers, S.C. and Majluf, N.S. (1984) Corporate Financing and Investment Decisions When Firms Have Information That Investors Do Not Have. *Journal of Financial*

- Economics*, **13**, 187-221. [https://doi.org/10.1016/0304-405X\(84\)90023-0](https://doi.org/10.1016/0304-405X(84)90023-0)
- [53] Faulkender, M. (2005) Hedging or Market Timing? Selecting the Interest Rate Exposure of Corporate Debt. *The Journal of Finance*, **60**, 931-962. <https://doi.org/10.1111/j.1540-6261.2005.00751.x>
- [54] Adam, T.R. and Fernando, C.S. (2006) Hedging, Speculation, and Shareholder Value. *Journal of Financial Economics*, **81**, 283-309. <https://doi.org/10.1016/j.jfineco.2005.03.014>
- [55] Cooper, I.A. and Mello, A.S. (1999) Corporate Hedging: The Relevance of Contract Specifications and Banking Relationships. *European Finance Review*, **2**, 195-223. <https://doi.org/10.1023/A:1009790704572>
- [56] Tirole, J. (2010) *The Theory of Corporate Finance*. Princeton University Press, Princeton.
- [57] Myers, S.C. (1977) Determinants of Corporate Borrowing. *Journal of Financial Economics*, **5**, 147-175. [https://doi.org/10.1016/0304-405X\(77\)90015-0](https://doi.org/10.1016/0304-405X(77)90015-0)
- [58] Smith, C.W. and Warner, J.B. (1979) On Financial Contracting: An Analysis of Bond Covenants. *Journal of Financial Economics*, **7**, 117-161. [https://doi.org/10.1016/0304-405X\(79\)90011-4](https://doi.org/10.1016/0304-405X(79)90011-4)
- [59] Stulz, R.M. (2005) Rethinking Risk Management. *Journal of Applied Corporate Finance*, **9**, 8-25. <https://doi.org/10.1111/j.1745-6622.1996.tb00295.x>
- [60] Leland, H.E. and Toft, K.B. (1996) Optimal Capital Structure, Endogenous Bankruptcy, and the Term Structure of Credit Spreads. *The Journal of Finance*, **51**, 987-1019. <https://doi.org/10.1111/j.1540-6261.1996.tb02714.x>
- [61] Spanò, M. (2013) Theoretical Explanations of Corporate Hedging. *International Journal of Business and Social Research*, **3**, 84-102.
- [62] Marin, M. (2013) Can Financial Risk Management Help Prevent Bankruptcy? *Journal of Finance and Accountancy*, **12**, 1-18.
- [63] Disatnik, D., Duchin, R. and Schmidt, B. (2014) Cash Flow Hedging and Liquidity Choices. *Review of Finance*, **18**, 715-748. <https://doi.org/10.1093/rof/rft006>
- [64] Tai, V.W., Lai, Y.H., Yang, T.H. and Yu, M.T. (2014) Corporate Hedging and Corporate Governance: The Role of the Board and the Audit Committee.
- [65] Nova, M.V., Cerqueira, A.M. and Brandão, E. (2015) Hedging with Derivatives and Firm Value. No. 568, Universidade do Porto, Faculdade de Economia do Porto, Porto.
- [66] Ayturk, Y., Gurbuz, A.O. and Yanik, S. (2016) Corporate Derivatives Use and Firm Value: Evidence from Turkey. *Borsa Istanbul Review*, **16**, 108-120. <https://doi.org/10.1016/j.bir.2016.02.001>
- [67] Patnaik, I., Shah, A. and Singh, N. (2015) Foreign Currency Borrowing by Indian Firms. Working Paper, International Growth Center.
- [68] Sivakumar, A. and Sarkar, R. (2008) Corporate Hedging for Foreign Exchange Risk in India. Industrial and Management Engineering Department, Indian Institute of Technology, Kanpur.
- [69] Patnaik, I. and Shah, A. (2010) Does the Currency Regime Shape Unhedged Currency Exposure? *Journal of International Money and Finance*, **29**, 760-769. <https://doi.org/10.1016/j.jimonfin.2009.12.007>
- [70] Daka, V.R. and Basu, S. (2016) Is Corporate Hedging Consistent with Value-Maximization in Emerging Markets? An Empirical Analysis of Indian Firms. *Journal of Accounting*, **6**, 30-48.

**Submit or recommend next manuscript to SCIRP and we will provide best service for you:**

Accepting pre-submission inquiries through Email, Facebook, LinkedIn, Twitter, etc.

A wide selection of journals (inclusive of 9 subjects, more than 200 journals)

Providing 24-hour high-quality service

User-friendly online submission system

Fair and swift peer-review system

Efficient typesetting and proofreading procedure

Display of the result of downloads and visits, as well as the number of cited articles

Maximum dissemination of your research work

Submit your manuscript at: <http://papersubmission.scirp.org/>

Or contact [tel@scirp.org](mailto:tel@scirp.org)