

# Theoretical Approaches on Optimal Capital Structure

MARIA ZENOVIA GRIGORE

Associate Professor PhD, Faculty of Economics,  
„Nicolae Titulescu” University of Bucharest  
ROMANIA  
mgrigore@univnt.ro

MARIANA GURĂU

Lecturer PhD, Faculty of Economics,  
„Nicolae Titulescu” University of Bucharest  
ROMANIA  
marianagurau@univnt.ro

*Abstract: F. Modigliani and M. Miller demonstrated in 1958 that in the context of perfect market the financial structure of the firm does not influence its value. Since then, many researchers have approached the issue of financial structure in less restrictive hypotheses. Without reaching a consensus, they have tried to prove that the optimal capital structure exists. The goal of this article is to synthesize the literature on the financial structure and to relate the theories to known empirical evidence. The main models of the optimal financial structure belong to the agency theory, the signalling theory, the transaction cost economics and the pecking order theory. Financing decision varies according to a number of factors that may influence capital structure differently: firm profitability, dividend policy, growth opportunities, asset specificity, corporate tax shield, company size and some macroeconomic factors such as inflation rate and capital market condition.*

*Keywords: optimal financial structure, agency theory, signalling theory, transaction cost economics, pecking order theory*

## 1. Introduction \* \*

The capital structure of a firm is the relative proportions of debt (bank loans or bonds issuance) and equity (common and preferred stocks) in the total financing of its assets. Planning the capital structure leads to optimizing the use of funds and the ability of adapting easily to environmental changes. The goal of this work is to synthesize the theories on the capital structure and where is possible, to relate these theories to known empirical evidence.

An archetypal construction of the image of a theory that relies on a set of hypothesis empirically tested in order to describe the information as foundation element required for the fulfilment of the needs of a company has been shaped by professor Raymond J. Chambers in the '50s. Using this framework as a preceding mechanism to the formation of the positive theory leads to the idea that the theories can present a set of objectives and hypothetical realities based on a process rich in theoretical knowledge.<sup>1</sup>

The first theorists who analysed the optimal capital structure are F. Modigliani and M. Miller who claimed in 1958 that the value of the enterprise is the same regardless of its financial structure<sup>2</sup>. Their research was based on the hypotese of no taxes (either personal or corporate). Five years later, the two authors reverted to this statement, pointing out that in the presence of corporate income tax, the value of an indebted firm is equal to the value of an unindebted firm, increased by the tax savings achieved as a result of indebtedness<sup>3</sup>.

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<sup>1</sup> V. M. Stefan-Duicu, Contabilitatea si rationamentul profesional, Nemira Publishing House, pg. 105, 2016.

<sup>2</sup> F. Modigliani and M Miller, The cost of capital. Corporation Finance and the theory of investment, American Economic Review, 49, 1958

<sup>3</sup> F. Modigliani and M Miller, Corporate income taxes and the cost of capital: A correction, American Economic, Review, 53, 1963

The main criticism that can be attributed to F. Modigliani and M. Miller's model is its unrealistic assumptions. According to the two authors, the only goal of the company is to produce cash-flow and share it between shareholders and creditors. They consider that managers always act according to the shareholders' interests and there are no conflicts between the objectives of the creditors and those of the shareholders. For F. Modigliani and M. Miller the majority shareholders and the minority shareholders have the same objectives. In addition, information is accessible to all and there is no information asymmetry between those who hold capital and those who need it.

Since F. Modigliani and M. Miller, many researchers have approached the study of the corporate capital structure based on less restrictive hypotheses, trying to find the optimal capital structure. In this paper will be analysed the most relevant results of these researches, namely the agency theory, the signalling theory, the contracting cost theory and the pecking order theory.

## **2. Theoretical approaches on optimal capital structure**

### **2.1. The financing decision and the agency theory**

In the agency theory, the company is no longer seen as an actor, aiming to maximize profit, but as a group of partners, each with its own goal. The company's behaviour is comparable to the market, in the sense that it is the result of a complex balancing process. Different participants in the life of the enterprise (managers, shareholders, creditors, employees etc.), taken separately, have certain goals and interests that are not necessarily conciliatory in a spontaneous manner. Consequently, conflicts can arise between them, especially since the function of the modern enterprise, based on the separation of property and power, requires that the administration be entrusted to managers by those who hold the funds.

The optimal financial structure results from a compromise between the different types of capital (equity or debts) that can solve these divergences of interests, considering that leverage and use of equity diminish certain conflicts and induce others. This financial structure should allow maximizing the company's global value.

In the agency theory, indebtedness is considered a way to resolve potential conflicts between managers and shareholders. In 1976, M. Jensen and W. Meckling<sup>4</sup> showed that in order to find the optimal financial structure of the firm, two consequences of indebtedness must be taken into account:

- In the presence of corporate income tax, managers are interested in indebtedness because interest expenses are deductible leading to reduced corporate tax and net profit growth;

- The indebtedness generates three types of agency costs: control costs (for shareholders) and justification costs (for managers); costs caused by the risks related to the firm's investments, which lead to the increase of the interest rate required by the creditors; bankruptcy costs.

The indebtedness allows shareholders and managers to adhere to same objectives.

Companies are interested to indebt until the point on the increase of its value owed to the financed investments will be equal to the marginal costs generated by the indebtedness. The optimal level of indebtedness is the one that allows the minimization of overall agency costs.

The indebtedness incites managers to be efficient. More the company is indebted, more its bankruptcy risk is higher. For managers the bankruptcy means generally losing their jobs, the remunerations and other advantages. For this reason managers will aim to maximize cash-flow and choose investment projects with positive net present value. In the absence of indebtedness, the bankruptcy risk is limited, but the market will assume that the managers do not aim maximum performance. The value of the company will decrease and, if there exists a managers' co-interest system (remuneration related to the value of company shares), they will lose.

For shareholders, the indebtedness has two advantages over the issuance of new shares. The first is the leverage effect on the return on equity. The second advantage is that the loan does not lead to dilution of the share capital.

The indebtedness resolves certain conflicts of interest between shareholders and managers, but generates new conflicts (between shareholders, sometimes allied with managers, and creditors) and costs (costs of bankruptcy and reorganization, agency costs, monitoring costs).

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<sup>4</sup> M. Jensen and W. Meckling, Theory of the firm: Managerial behavior, agency costs and ownership structure, Journal of Financial Economics, vol. 3, octombrie 1976

Allying, shareholders and managers can divert in their advantage part from the company's assets to the detriment of the creditors. For example, they can use a loan to distribute dividends.

In a company with high debts reported to the equity, the owners of the firm could be tempted to take excessively risky projects. Shareholders will practically benefit from all the advantages if the investments turn out to be profitable. Otherwise, most of the losses are borne by the creditors. The interests of creditors and shareholders are therefore in direct conflict. This inefficiency is one of the costs of indebtedness.

Creditors know that shareholders are tempted to choose risky investments or to incite managers to do so. Therefore, they may include in the loan agreement clauses that restrict the managers' abilities to make risky investments on the duration of the loan agreement or clauses that allow creditors to demand early repayment of the debt in case of excessive risk.

The second problem of over-indebtedness is the company's inability to finance profitable investments because its indebtedness level is too high. For example, a company with a debt of EUR 10,000,000 has the opportunity to make an investment of EUR 5,000,000 with a gross profit of EUR 12,000,000 and a net present value of EUR 7,000,000. If the EUR 10,000,000 loan clauses provide for the priority reimbursement of this debt, then no new lender or investor will want to fund the new investment. From the net profit of EUR 12,000,000, the first EUR 10,000,000 will go directly to current creditors, leaving only EUR 2,000,000 instead of EUR 5,000,000 to repay the new loan. This investment cannot therefore be realized, resulting in a loss of value.

In order to find solutions to the conflicts that may arise between shareholders and managers on the one hand and creditors on the other hand, it is necessary to look for the means by which shareholders and managers are prevented from acquiring a share of the wealth of the enterprise to the detriment of the creditors. Therefore, it is necessary to try to limit or avoid decisions that increase the risk of company's assets or that lead to sub-investment and tend to reduce the value of existing debts, even if this involves a decrease of the company's value. In addition to the various legal subtleties that can be incorporated into loan agreements, other solutions are also in practice:

A solution to resolve these conflicts is the special clauses set out in the loan agreement, such as: guarantees or security clauses, setting limits on debt, dividend distribution limitation clauses and early repayment clauses.

Another solution is the issuance of convertible bonds or bonds with stock option. The convertibility clause or the exercise of the stock option may prompt the current shareholders to change the structure and risk of the asset portfolio in order to increase their long-term profit, as this could also come to the bondholders who are potential shareholders.

## **2.2. The capital structure and the signalling theory**

Empirical studies demonstrated that the announcement of a stock issue can drive down the stock price, while additional indebtedness leads to an increase in the stock price. In addition, for complex securities transactions (such as shares with priority of dividends or convertible bonds) or for the simultaneous sale and purchase of securities of various forms (such as bond issue to finance share repurchase), we can see that the more issued securities are more like equity, the more the stock will fall. All of these findings can be explained by the signalling theory.

The basis of the signalling theory is the concept of information asymmetry. Managers of a company know more than outside investors (shareholders or creditors) about the profitability and prospects of the company. Hence, investors may be interested in a signalling activity done by managers.

The information disseminated by managers is not necessarily true. According to the signalling theory, the managers of the performing firms can send specific and effective signals that separate these companies from the non-performing ones. The particularity of these signals is that they are difficult to be imitated by the non-performing companies. The most used signals of this type are the capital structure, the dividend policy or the use of complex financial securities.

Another signal regarding the value of the firm is the degree of diversification of the portfolio of a majority shareholder. If he owns a profitable investment project, he will affect a large part of his savings for this project, to the detriment of other forms of placement. Given the asymmetry of information, the low degree of diversification of his portfolio can be interpreted as a signalling activity tending to prove the value of the project to the market.

Starting from this observation, H. Leland and D. Pyle<sup>5</sup> argue that the value of a company is positively correlated with the share of capital held by the majority shareholder. Any change in the portfolio of the majority shareholder will lead to a change in the market's perception of future cash flows.

Research in this direction is continued by S. Ross<sup>6</sup> who deduces that the financial structure chosen by the managers for their company is a signal regarding the type of the firm. For S. Ross, the market only evaluates the perceived cash flow. Managers, who have privileged information about these flows, can make changes in the financial structure of their business and thus change the perception of the market. Managers must derive an interest in the issuance of these signals and be penalized for the issuance of a misleading signal. A good company is therefore the one that borrows and repays the debts at maturity, according to the loan agreements. The model proposed by S. Ross<sup>7</sup> consists of the balance based on the combination between a signalling activity and an incentive system. This model leads to the following conclusions, which can be compared to those of M. Miller and F. Modigliani: the cost of capital is independent of the financing decision, even if the level of indebtedness is specific to each enterprise; bankruptcy risk is an increasing function of the level of indebtedness.

Despite the reserves and criticisms addressed to S. Ross's model, it presents a coherent theory of the financial structure of the enterprise.

### **2.3. Transaction cost economics and the financing decision**

The contracting cost theories have their origin in the "Nature of the Firm" of Ronald Coase<sup>8</sup>, and were developed later by Oliver Williamson in "Markets and Hierarchies"<sup>9</sup>. One of the contractual theories is known as Transaction Cost Economics (TCE) and comes from the work of these authors. TCE argues that in some circumstances a hierarchy (a firm) can make a more efficient allocation of resources than a market (a bargaining system). This is due to imperfections in markets such as imperfect information and bounded rationality. These imperfections generate three types of transaction costs:

- Information costs: costs associated with searching relevant information and meeting the agents with whom the exchange will take place. For example, stock brokers mediate the market transactions of investors and their fees reflect the information costs.
- Bargaining costs: costs associated with coming to a reasonable agreement and drawing up an appropriate contract.
- Policing and enforcement costs: costs related to supervising the fulfilment of the contract and make sure that the other party sticks to the terms of the contract. This category includes the litigation costs.

O. Williamson starts from the observation that after signing a contract, the parties to the contract (shareholders, managers, creditors) can change their behaviour to their advantage, which can lead to perpetual ex-post adjustments to make the long-term contractual relationship viable. In the case of a financing contract, the issue of debt or equity is no longer just a source of funding, but also a means by which these adjustments are made. It is a different approach to what has been presented so far, because the financing decision is taken according to the company's assets, not its liabilities. The decision to issue debts or equity to fund an investment project is similar to the company's decision to buy a product from the market or to produce itself. Loan financing corresponds to the market, while equity financing is closer to the hierarchy.

According to Williamson<sup>10</sup>, the choice of funds will be determined by the degree of specificity of the assets. Asset specificity can take a variety of forms, including: location specificity (a buyer or seller locates its facilities next to the other to economize on inventories or transportation costs), physical asset specificity (investments are made in specialized equipment or tooling designed for a particular customer), human capital specificity (one or both of the parties develop skills or knowledge specific to the buyer-seller relationship) etc.

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<sup>5</sup> H. Leland and D. Pyle, Informational asymmetries, Financial Structure and Financial Intermediation, *Journal of Finance*, 32-2, 1977

<sup>6</sup> S. Ross, The determination of financial structure: the incentive – Signaling approach, *Bell Journal of Economics*, 8-1, 1977

<sup>7</sup> S. Ross, Some notes on financial incentives — Signaling models, activity choice and risk preferences. *Journal of Finance*, 33-3, 1978

<sup>8</sup> R. Coase, The nature of the firm, *Economica*, vol. 4, 1937

<sup>9</sup> O. Williamson, *Markets and Hierarchies*, New York, The Free Press, 1975

<sup>10</sup> O. Williamson, Corporate Finance and Corporate Governance, the *Journal of Finance*, vol. 43, nr. 3, Iulie, 1988

Investment in a specific asset is generally the subject of incomplete contracts between the firm and investors to allow significant subsequent adaptations. The issue of equity is more efficient than the debt to make these adjustments. For example, if the specific investment is a research and development project, the shareholders will tolerate more than the creditors the fact that it does not generate the expected profitability within the planned deadlines.

Instead, indebtedness does not allow for ex-post adjustments because the interest must be paid at regular intervals, the loan must be reimbursed at the due dates, otherwise bankruptcy procedure will occur. Moreover, if the investment is specific, the borrowers will fear this potential bankruptcy and therefore require very high interest rates.

If the asset funded is not specific, debt, which is a simpler financing formula, seems more appropriate. Indeed, the probability of making ex-post adjustments is minimal since this investment will probably generate income more regularly.

In some situations the most advantageous form of financing is leasing, which corresponds to the hybrid form of organization.

Suppose an enterprise needs regular (not specific) equipment and that the purchase of products resulting from the use of this equipment is defective or unsatisfactory. We also believe that this equipment easily supports intensive use (its maintenance and overheating costs are low). Under these circumstances, the most advantageous way for a company to obtain those products is by using that asset under a leasing contract. Firstly, the company has no interest in being the owner and user of the equipment at the same time, the cost of use being the same. Secondly, the owner (the lessor) can specialize in this type of equipment and can resume and rent the equipment more efficiently than a financial lender could do. Leasing appears for the asset considered as the lowest-cost financing method.

#### **2.4. The pecking order theory and the optimal capital structure**

If for O. Williamson the specificity of the assets explains the choice of financing mode and therefore the financial structure, for S. Myers and Majluf<sup>11</sup> the preference for a particular way of financing has another explanation.

S. Myers sees the firm as a coalition seeking to increase the volume of corporate wealth, which is made up of equity and organizational surplus. The last one reflects the present value of the costs of overly high wages, too many staff, gratuities, and so on. Creditors can impose reduction of the organizational surplus if the reimbursement of the debt or the payment of interest is compromised. This situation can be avoided if the company is financed by internal funds, meaning by earnings retained and reinvested.

If it is necessary to resort to external financing, the issue of debts will be preferred over the issue of equity that would implicitly require the distribution of additional dividends. The indebtedness has a minor effect on stock price. There is less scope for debt to be misvalued and therefore an issue of debt is a less worrisome signal to investors.

According to the pecking order theory of capital structure companies prefer internal finance, because these funds are raised without sending any adverse signals that may lower the stock price. If external finance is required, firms issue debts first and issue equity only as a last resort. This pecking order is due to the fact that investors consider the debt issue as a good omen and the equity issue as a bad omen.

The pecking order theory seems to work best for mature, profitable companies of most business. But there are exceptions. For example, fast-growing high-tech firms often issue common stock to finance their investments.

### **3. Conclusions**

Considerable work has been done to test the validity of the main theories of capital structure. *Table 1* shows a summary of the origins and evidence of these theories.

The inventory of empirical works shows that there is no clear solution for finding the optimal financial structure. The four theories analyzed and their outcomes are valid only under certain conditions and with certain limitations. The conflict arises also between the outcomes and recommendations of the various theories that are often mutually exclusive.

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<sup>11</sup> S. Myers and N. Majluf, Corporate financing and investment decisions when firms have information that investors do not have, *Journal of Financial Economics*, vol. 13, June 1984

In conclusion, there are many factors affecting the capital structure of firms. The most prominent factors that have been correlated to leverage are:

- Firm profitability. The pecking order theory hypothesises that profitability is inversely related to leverage. In contrast, the agency and signalling theories suggest that profitability is directly related to leverage for two reasons: to take advantage of the interest tax shields associated with higher leverage, and to discipline managers by paying out cash to creditors instead of wasting the funds on negative net present value projects.
- Asset specificity. The general consensus among researchers is that debt financing is suitable for low specificity assets, and equity is preferred when the level of specificity is high.
- Size of the company. Size can be considered as an explanatory predictor for variations in firm leverage. Several financial theorists consider that the larger firms can negotiate for loans on more favourable terms, so are more likely to take on more debt than smaller firms. In addition, banks prefer to loan larger firms because they are less risky than smaller firms. Other analysts argue that the fixed costs associated with equity issues should be smaller for large firms. On that account, the company's size should be inversely correlated to leverage.
- Age of the company. Age plays a significant role on firms' ability to acquire debt. Older firms are deemed to be more stable and thus more reputable due to their ability to survive over a longer period of time. Therefore, the prediction is that older firms will have more long term debt in their capital structures.
- Growth prospects. The general consensus among researchers is that growth opportunities are negatively related to leverage, principally because future growth prospects are intangible and hence cannot be easily collateralised.
- Corporate income tax. Modigliani and Miller demonstrated that the tax savings associated with interest tax shields induce firms to take on more debt. Therefore, a positive association between tax and leverage should be observed.
- Dividend policies. Empirical evidence on the relevancy of dividend policy has provided conclusive evidence on the dividend signalling theory, which suggests that dividend increases are associated with managements' confidence of future stability of cash flows. Dividend pay-out ratio is theoretically predicted to be negatively correlated to leverage due to the positive association between dividend pay-out and the market value of equity.
- Institutional, legal and financial factors. Fan, Titman and Twite (2008: 2) examine a cross-section of firms in a heterogeneous sample of firms in 39 countries, and they conclude that institutional differences are an important determining factor of capital structure choices compared to other factors like industry affiliation. For example, they document that firms tend to use less debt in countries where dividends are preferentially taxed. The cost-benefit analysis of the funding options allows for the optimal financial structure.

**Table 1: Summary of the origins and evidence of the main theories of capital**

Theory	Origin of theory	Evidence for	Evidence against
Agency cost theory	Jensen and Meckling (1976)	Kim and Sorensen (1986) Vilasuso and Minkler (2001) Harvey et al. (2004) Berger and Bonaccorsi di Patti (2006)	Brounen, DeJong Koedijk (2006)
Signalling theory	Leland and Pyle (1977) Ross (1977)	Myers and Majluf (1984) Smith (1986) Brennan and Kraus (1987) Baker and Wurgler (2002)	Barclay and Smith (1996) Barclay and Smith (2005) Brounen et al. (2006)
Transaction cost economics	Coase (1937) Williamson (1975)	Bradley, Jarrell and Kim (1984) Barclay and Smith (1995) Frank and Goyal (2009)	Abor and Biekpe (2005) Mutenheri and Green (2003)
Pecking order theory	Myers and Majluf (1984)	Kester (1986) Titman and Wessels (1988) Rajan and Zingales (1995) De Migueland Pindado (2001) Flannery and Rangan (2006) Leary & Roberts (2010)	Helwege and Liang (1996) Frank and Goyal (2003)

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