Chapter 14
Optimal Capital Structure
Reflections on Economic and Other Values

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Abstract Despite a vast literature on the capital structure of the firm there still is a big gap between theory and practice. Starting with the seminal work by Modigliani and Miller, much attention has been paid to the optimality of capital structure from the shareholders' point of view. Over the last few decades studies have been produced on the effect of other stakeholders' interests on capital structure. Another area that has received considerable attention is the relation between managerial incentives and capital structure. Furthermore, the issue of corporate control and, related, the issue of corporate governance, receive a lion's part of the more recent academic attention for capital structure decisions. From all these studies, one thing is clear: The capital structure decision (or rather, the management of the capital structure over time) has to deal with more issues than the maximization of the firm's market value alone. In this paper, we give an overview of the different objectives and considerations that have been proposed in the literature. We show that capital structure decisions can be framed as multiple criteria decision problems which can then benefit from multiple criteria decision support tools that are widely available.

14.1 Introduction

Despite a vast literature on the capital structure of the firm (see [10, 22], for overviews) there still is a big gap between theory and practice (see e.g. [6, 18]). Starting with the seminal work by Modigliani and Miller [35, 36], much attention

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has been paid to the optimality of capital structure from the shareholders' point of view.

Over the last few decades studies have been produced on the effect of other stakeholders' interests on capital structure. Well-known examples are the interests of customers who receive product or service guarantees from the company (see e.g. [19]). Another area that has received considerable attention is the relation between managerial incentives and capital structure (Ibid.). Furthermore, the issue of corporate control[1] (see [27]) and, related, the issue of corporate governance[2] (see [50]), receive a lion's part of the more recent academic attention for capital structure decisions.

From all these studies, one thing is clear: The capital structure decision (or rather, the management of the capital structure over time) involves more issues than the maximization of the firm's market value alone. In this paper, we give an overview of the different objectives and considerations that have been proposed in the literature. We make a distinction between two broadly defined situations. The first is the traditional case of the firm that strives for the maximization of the value of the shares for the current shareholders. Whenever other considerations than value maximization enter capital structure decisions, these considerations have to be instrumental to the goal of value maximization. The second case concerns the firm that explicitly chooses for more objectives than value maximization alone. This may be because the shareholders adopt a multiple stakeholders approach or because of a different ownership structure than the usual corporate structure dominating finance literature. An example of the latter is the co-operation, a legal entity which can be found, in among others, many European countries. For a discussion on why firms are facing multiple goals, we refer to Hallerbach and Spronk [20, 21].

In Section 14.2 we will describe objectives and considerations that, directly or indirectly, clearly help to create and maintain a capital structure which is "optimal" for the value maximizing firm. In Section 14.3 we describe other objectives and considerations. Some of these may have a clear negative effect on economic value, others may be neutral and in some cases the effect on economic value is not always completely clear. Section 14.4 shows how, for both cases, capital structure decisions can be framed as multiple criteria decision problems which can then benefit from multiple criteria decision support tools. Section 14.5 gives a brief summary.

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[1] Corporate Control is defined by Jensen and Ruback [27] as the rights to determine the management of corporate resources - that is, the rights to hire, fire and set the compensation of top-level managers.

[2] According to Shleifer and Vishney [50] corporate governance deals with the ways in which suppliers of finance to corporations assure themselves of getting a return on their investment. A broader definition is given by the OECD: "Corporate governance is the system by which business corporations are directed and controlled. The corporate governance structure specifies the distribution of rights and responsibilities among different participants in the corporation, such as, the board, managers, shareholders and other stakeholders, and spells out the rules and procedures for making decisions on corporate affairs. By doing this, it also provides the structure through which the company objectives are set, and the means of attaining those objectives and monitoring performance".

14.2 Maximizing Shareholder Value

According to the neoclassical view on the role of the firm, the firm has one single objective: maximization of shareholder value. Shareholders possess the property rights of the firm and are thus entitled to decide what the firm should aim for. Since shareholders only have one objective in mind - wealth maximization - the goal of the firm is maximization of the firm's contribution to the financial wealth of its shareholders. The firm can accomplish this by investing in projects with a positive net present value.[3] Part of shareholder value is determined by the corporate financing decision.[4] Two theories about the capital structure of the firm - the trade-off theory and the pecking order theory - assume shareholder wealth maximization as the one and only corporate objective. We will discuss both theories including several market value related extensions. Based on this discussion we formulate a list of criteria that is relevant for the corporate financing decision in this essentially neoclassical view.

The original proposition I of Modigliani and Miller [35] states that in a perfect capital market the equilibrium market value of a firm is independent of its capital structure, i.e. the debt-equity ratio.[5] If proposition I does not hold then arbitrage will take place. Investors will buy shares of the undervalued firm and sell shares of the overvalued firm in such a way that identical income streams are obtained. As investors exploit these arbitrage opportunities, the price of the overvalued shares will fall and that of the undervalued shares will rise, until both prices are equal.

When corporate taxes are introduced, proposition I changes dramatically. Modigliani and Miller [35, 36] show that in a world with corporate tax the value of firms is among others a function of leverage. When interest payments become tax deductible and payments to shareholders are not, the capital structure that maximizes firm value involves a hundred percent debt financing. By increasing leverage, the payments to the government are reduced with a higher cash flow for the providers of capital as a result. The difference between the present value of the taxes paid by an unlevered firm (G_u) and an identical levered firm (G_l) is the present value of tax shields ($PVTS$). Figure 14.1 depicts the total value of an unlevered and a levered firm. The higher leverage, the lower G_l, the higher $G_u - G_l (= PVTS)$.[6]

[3] This view is seen as an ideal by many; see for example [23].

[4] Financial decisions that influence the value of the firm are the capital budgeting decision and the corporate financing decision. In this paper we focus on the corporate financing decision made by the firm.

[5] As Miller and Modigliani [35] formulate their proposition I in a perfect capital market: "The market value of any firm is independent of its capital structure and is given by capitalizing its expected return (i.e. cash flows) at the ρ_k (i.e. capitalization rate) appropriate to its class." With as a result of the former "That is, the average cost of capital to any firm is completely independent of its capital structure and is equal to the capitalization rate of a pure equity stream of its class." ([35], p. 268–269).

[6] See Schauten and Tans [49] for a derivation of the cost of tax for the government.

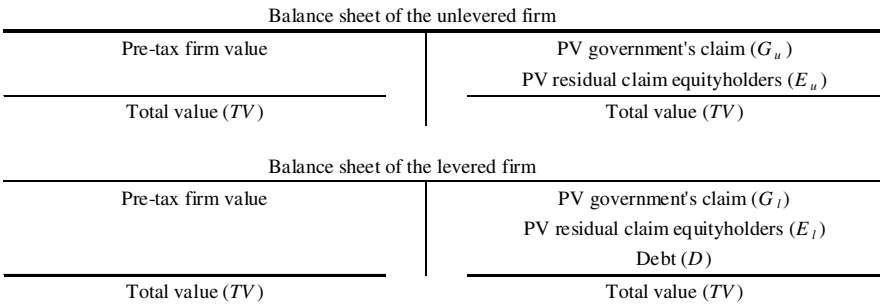

Fig. 14.1 Pre-tax value of the firm
This figure presents the expanded balance sheet of the unlevered and the levered firm with on the left hand side the pre-tax value of the firm and on the right hand side the present value of the tax payments to the government by the unlevered firm (G_u) and the levered firm (G_l), the market value of equity of the unlevered firm (E_u) and the levered firm (E_l) and the market value of debt of the levered firm (D).

In the traditional trade-off models of optimal capital structure it is assumed that firms balance the marginal present value of interest tax shields[7] against the marginal direct costs of financial distress or direct bankruptcy costs.[8] Additional factors can be included in this trade-off framework. Other costs than direct costs of financial distress are agency costs of debt [26]. Often cited examples of agency costs of debt are the underinvestment problem [37],[9] the asset substitution problem ([16, 26]), the "play for time" game by managers, the "unexpected increase of leverage (combined with an equivalent pay out to stockholders to make to increase the impact)," the "refusal to contribute equity capital" and the "cash in and run" game [7]. These problems are caused by the difference of interest between equity and debt holders and could be seen as part of the indirect costs of financial distress. Another benefit of debt - besides the PVTS - is the reduction of agency costs between managers and external holders of equity ([23, 24, 26]). Jensen and Meckling [26] argue that debt, by allowing larger managerial residual claims because the need for external equity is reduced by the use of debt, increases managerial effort to work. In addition, Jensen [23] argues that high leverage reduces free cash (flow) with less resources to waste

[7] Miller [33] argued that under certain conditions, the corporate tax advantage of debt may be offset by tax disadvantages at the personal level, making leverage from a tax shield perspective irrelevant.

[8] Direct bankruptcy costs are the costs of the use of the legal mechanism allowing creditors to take over a firm when it defaults [7]. Direct bankruptcy costs consist of administrative costs and legal fees. Robichek and Myers [46] and Baxter [3] suggest that the cost associated with bankruptcy might represent the missing element in the theory of Miller and Modigliani. However, Modigliani and Miller [35] already remark that reorganization involves costs and might have unfavorable effects on earnings prospects, with a discount on the value of heavily indebted companies as a result, see Ibid. footnote 18.

[9] The underinvestment problem is sometimes referred to as the debt overhang problem [19] (p.563).

on unprofitable investments as a result.[10] The agency costs between management and external equity are often left out the trade-off theory since it assumes managers not acting on behalf of the shareholders (only) which is an assumption of the traditional trade-off theory.

In Myers' [38] and Myers and Majluf's [42] pecking order model there is no optimal capital structure.[11] Instead, because of asymmetric information and signaling problems associated with external financing, firm's financing policies follow a hierarchy, with a preference for internal over external finance, and for debt over equity.[12] A strict interpretation of this model suggests that firms do not aim at a target debt ratio. Instead, the debt ratio is just the cumulative result of hierarchical financing over time. (See [51]). Original examples of signaling models are the models of Ross [47] and Leland and Pyle [30]. Ross [47] suggests that higher financial leverage can be used by managers to signal an optimistic future for the firm and that these signals cannot be mimicked by unsuccessful firms.[13] Leland and Pyle [30] focus on owners instead of managers. They assume that entrepreneurs have better information on the expected cash flows than outsiders have. The inside information held by an entrepreneur can be transferred to suppliers of capital because it is in the owner's interest to invest a greater fraction of his wealth in successful projects. Thus the owner's willingness to invest in his own projects can serve as a signal of project quality. The value of the firm increases with the percentage of equity held by the entrepreneur relative to the percentage he would have held in case of a lower quality project. (See [10]).

The stakeholder theory formulated by Grinblatt and Titman [19] suggests that the way in which a firm and its *non-financial* stakeholders interact is an important determinant of the firm's optimal capital structure. Non-financial stakeholders are those parties other than the debt and equity holders.[14] Non-financial stakeholders include

[10] Jensen predicts a positive relation between leverage and profitability if the market for corporate control is effective and forces firms to commit to paying out cash by levering up. However, if this market is ineffective, i.e. managers prefer to avoid the disciplining role of debt, a negative relation between profitability and leverage could be expected [45]. The free cash flow theory of Jensen could then be presented as separate theory that assists the trade-off theory in explaining why managers do not fully exploit the tax advantages of borrowing (as suggested by Myers [41], p.99).

[11] In 1984, the pecking order story was not new. Donaldson [12, 13] for example observed pecking order behavior in case studies. However, the pecking order until then was viewed as managerial behavior - possibly to avoid the discipline of capital markets.

[12] The pecking order theory assumes that managers know more about their companies' prospects, risks and values than do outside investors.

[13] Such unsuccessful firms do not have sufficient cash flow. This concept is easily applied to dividend policy as well. A firm that increases dividend payout is signalling that it has expected future cash flows that are sufficiently large to meet debt payments and dividend payments without increasing the probability of bankruptcy. (See [10]). Miller and Rock [34] develop a financial signalling model founded on the concept of "net dividends." An unexpected increase in dividends will increase shareholders' wealth and an unexpected issue of new equity or debt will be indebted as bad news about the future prospects of the firm.

[14] The stakeholder theory is probably inspired by, among others, Baxter [3] and Kim [29] who discuss indirect costs of financial distress.

firm's customers, employees, suppliers and the overall community in which the firm operates. These stakeholders can be hurt by a firm's financial difficulties. For example customers may receive inferior products that are difficult to service, suppliers may lose business, employees may lose jobs and the economy can be disrupted. Because of the costs they potentially bear in the event of a firm's financial distress, non-financial stakeholders will be less interested ceteris paribus in doing business with a firm having a high(er) potential for financial difficulties. This understandable reluctance to do business with a distressed firm creates a cost that can deter a firm from undertaking excessive debt financing even when lenders are willing to provide it on favorable terms (Ibid., p.598). These considerations by non-financial stakeholders are the cause of their importance as determinant for the capital structure. This stakeholder theory could be seen as part of the trade-off theory (see [7], p.481, although the term "stakeholder theory" is not mentioned) since these stakeholders influence the indirect costs of financial distress.[15]

As the trade-off theory (excluding agency costs between managers and shareholders) and the pecking order theory, the stakeholder theory of Grinblatt and Titman [19] assumes shareholder wealth maximization as the single corporate objective.[16]

Based on these theories, a huge number of empirical studies have been produced. See e.g. Harris and Raviv [22] for a systematic overview of this literature.[17] More recent studies are e.g. Shyum-Sunder and Myers [51], testing the trade-off theory against the pecking order theory, Kemsley and Nissim [28] estimating the present value of tax shields, Andrade and Kaplan [1] estimating the costs of financial distress and Rajan and Zingales [45] investigating the determinants of capital structure in the G-7 countries. Rajan and Zingales [45][18] explain differences in leverage of individual firms with firm characteristics. In their study leverage is a function of tangibility of assets, market-to-book ratio, firm size and profitability.[19] Barclay and Smith [2] provide an empirical examination of the determinants of corporate debt maturity. Graham and Harvey [18] survey 392 CFOs about among others capital structure. We come back to this Graham and Harvey study in Section 14.3.[20]

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[15] The stakeholder theory could also explain observed pecking order behaviour in the market. See [19], p.613.

[16] In the Modigliani and Miller world, where agency problems are absent, maximizing the value of the firm is identical to maximizing shareholder's wealth. When agency problems exist there are ways to increase shareholder wealth at the expense of other stakeholders. (See e.g., [9], p.261).

[17] Harris and Raviv divide the evidence into four categories: i) evidence of general capital structure trends; ii) event studies that measure the impact on share prices of an announcement of a capital structure change, iii) studies that relate firm/industry characteristics to capital structure, iv) studies that measure the relationship between capital structure and factors associated with corporate control.

[18] Examples of other cross sectional studies before 1991 are: Bradley et al. [5], Long and Malitz [32], and Titman and Wessels [54].

[19] See Lemmon et al. [31] for empirical evidence against the explanatory power of determinants of capital structure such as size, market-to-book, profitability, and industry.

[20] For European firms Brounen et al. [8] did a similar survey as Graham and Harvey did for U.S. firms.

Cross sectional studies as by Titman and Wessels [54], Rajan and Zingales [45], Barclay and Smith [2] and Wald [55] model capital structure mainly in terms of leverage and then leverage as a function of different firm (and market) characteristics as suggested by capital structure theory.[21] We do the opposite. We do not analyse the effect of several firm characteristics on capital structure (c.q. leverage), but we analyse the effect of capital structure on variables that co-determine shareholder value. In several decisions, including capital structure decisions, these variables may get the role of decision criteria. Criteria which are related to the trade-off and pecking order theory are listed in Table 14.1. We will discuss these criteria using a simplified example in Section 14.4. Figure 14.2 illustrates the basic idea of our approach.

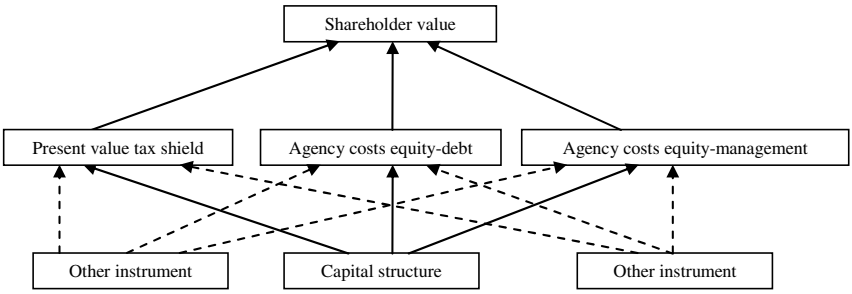

Fig. 14.2 Example of the basic idea of assumed relations within the neoclassical view

Figure 14.2 shows that shareholder value is related to the present value of tax shields and agency costs (both listed in Table 14.1 as determinants of shareholder value). The financing decision or "capital structure choice" now is an instrument that influences the value of these determinants. For example, the higher the leverage, the higher the present value of the tax shield. However, besides the financing decision, "other instruments" could have an influence (reflected with dotted arrows in Figure 14.2) on the value of these determinants as well. For example the decision to acquire assets that could be written of fast, influences the tax benefits of the interest deductibility. Of course, the financing decision influences the agency costs as well. For example, it could be argued that the agency costs between equity and debt increase with leverage. However, the tangibility of assets influences these agency costs as well. If a firm decides to invest in tangible assets this could have a negative impact on the magnitude of these agency costs. Put differently, agency costs are not minimized using one instrument only. Instead, a multiplicity of instruments is involved.

[21] In cross-sectional research, capital structure theories are tested by analyzing the relation between leverage (as endogenous variable) and some firm (and or country/institutional) characteristics (as exogenous variables). For example the static trade-off theory predicts that firms with a high profitability have higher leverage. A positive cross-sectional relation between the determinant profitability and leverage will be analysed. Proxies are used to measure leverage on the one hand and profitability on the other. If proxies are perfect indicators for the determinants then econometric tests reveal whether a relation between the variables exists. See e.g. [9].

The financing problem - even in a neoclassical context - is complex, because i) relevant "value determinants" are not influenced by capital structure only and ii) most if not all of these determinants cannot be translated into clearly quantifiable costs or benefits, even if we neglect the possible effect of other instruments on the selected determinants.

Table 14.1 Multiple criteria or determinants of capital structure

Category	#	Multiple criteria	References
Economic values	1	*Tax shield*	
		- corporate level	[35, 36]
		- personal level	[33]
	2a	*Direct costs of financial distress*	[35]
	2b	*Agency costs equity-debt*	
		- underinvestment	[37]
		- asset substitution (risk shifting)	[7, 16, 26]
		- refusing to contribute equity capital	Ibid.
		- cash in and run	Ibid.
		- playing for time	Ibid.
		- bait and switch	Ibid.
	2c	*Non-financial stakeholders*	
		- customers	[19]
		- employees	Ibid.
		- suppliers	Ibid.
		- community	Ibid.
	3	*Agency costs equity-management*	
		- residual claim	[26]
		- reduction free cash flow (overinvestment);	[23]
		corporate control shareholders,	[27]
		corporate governance	[50]
	4	*Following hierarchy and flexibility* (real options)	[38, 42]
	5	*Signaling*	[30, 47]
	6	*Subsidy*	[15]

14.3 Other Objectives and Considerations

A lot of evidence suggests that managers act not only in the interest of the shareholders (see [41]). Neither the static trade-off theory nor the pecking order theory can fully explain differences in capital structure. Myers [41] (p.82) states that "Yet even 40 years after the Modigliani and Miller research, our understanding of these

firms financing choices is limited."[22] Results of several surveys (see [8, 9, 18]) reveal that CFOs do not pay a lot of attention to variables relevant in these shareholder wealth maximizing theories. Given the results of empirical research, this does not come as a surprise.

The survey by Graham and Harvey finds only moderate evidence for the trade-off theory. Around 70% have a flexible target or a somewhat tight target or range. Only 10% have a strict target ratio. Around 20% of the firms declare not to have an optimal or target debt-equity ratio at all.

In general, the corporate tax advantage seems only moderately important in capital structure decisions. The tax advantage of debt is most important for large regulated and dividend paying firms. Further, favorable foreign tax treatment relative to the U.S. is fairly important in issuing foreign debt decisions.[23] Little evidence is found that personal taxes influence the capital structure.[24] In general potential costs of financial distress seem not very important although credit ratings are. According to Graham and Harvey this last finding could be viewed as an (indirect) indication of concern with distress. Earnings volatility also seems to be a determinant of leverage, which is consistent with the prediction that firms reduce leverage when the probability of bankruptcy is high. Firms do not declare directly that (the present value of the expected) costs of financial distress are an important determinant of capital structure, although indirect evidence seems to exist. Graham and Harvey find little evidence that firms discipline managers by increasing leverage. Graham and Harvey [18] (p.227) explicitly note that "1) managers might be unwilling to admit to using debt in this manner, or 2) perhaps a low rating on this question reflects an unwillingness of firms to adopt Jensen's solution more than a weakness in Jensen's argument."

The most important issue affecting corporate debt decisions is management's desire for financial flexibility (excess cash or preservation of debt capacity). Furthermore, managers are reluctant to issue common stock when they perceive the market is undervalued (most CFOs think their shares are undervalued). Because asymmetric information variables have no power to predict the issue of new debt or equity, Harvey and Graham conclude that the pecking order model is not the true model of the security choice.[25]

The fact that neoclassical models do not (fully) explain financial behavior could be explained in several ways. First, it could be that managers do strive for creating shareholder value but at the same time also pay attention to variables other than the variables listed in Table 14.1. Variables of which managers think, that they are

[22] These firms are public, non-financial corporations with access to U.S. or international capital markets.

[23] According to Graham and Harvey the most popular reason to issue foreign debt is that it provides a natural hedge against foreign currency devaluation.

[24] Graham [17] argues that companies do not make full use of interest rate tax shields.

[25] For European firms [8], p.99) find moderate support for the static trade-off theory. The results of the pecking order theory, the desire for financial flexibility and pecking order behavior are important considerations but as Graham and Harvey [18] conclude, asymmetric information is not the driving force behind this behavior.

(justifiably or not) relevant for creating shareholder value. Second, it could be that managers do not (only) serve the interest of the shareholders but of other stakeholders as well.[26] As a result, managers integrate variables that are relevant for them and or other stakeholders in the process of managing the firm's capital structure. The impact of these variables on the financing decision is not per definition negative for shareholder value. For example if "value of financial rewards for managers" is one of the goals that is maximized by managers - which may not be excluded - and if the rewards of managers consists of a large fraction of call options, managers could decide to increase leverage to lever the volatility of the shares with an increase in the value of the options as a result. The increase of leverage could have a positive effect on shareholder wealth (e.g. the agency costs between equity and management could be lower) but the criterion "value of financial rewards" could (but does not have to) be leading. Third, shareholders themselves do possibly have other goals than shareholder wealth creation alone. Fourth, managers rely on certain (different) rules of thumb or heuristics that do not harm shareholder value but can not be explained by neoclassical models either.[27] Fifth, the neoclassical models are not complete or not tested correctly (see e.g. [31, 51]).

Either way, we do expect that variables other than those founded in the neoclassical property rights view are or should be included explicitly in the financing decision framework. To determine which variables *should* be included we probably need other views or theories of the firm than the neoclassical alone. Zingales [56] argues that "*... corporate finance theory, empirical research, practical implications, and policy recommendations are deeply rooted in an underlying theory of the firm*" (Ibid., p.1623.). Examples of attempts of new theories are "the stakeholder theory of the firm" (see e.g. [14]), "the enlightened stakeholder theory" as a response (see [25]), "the organizational theory" (see [39, 40, 41]) and "the stakeholder equity model" (see [52]).

We introduce an organizational balance sheet which is based on the organizational theory of Myers [39]. The intention is to offer a framework to enhance a discussion about criteria that could be relevant for the different stakeholders of the firm. In Myers' organizational theory employees (including managers) are included as stakeholders; we integrate other stakeholders as suppliers, customers and the community as well. Figure 14.3 presents the adjusted organizational balance sheet.

Note that pre-tax value of the existing assets and the growth opportunities is the value of the firm including the present value of all stakeholders' surplus. The present value of the stakeholders' surplus (ES plus OTS) is the present value of future costs of perks, overstaffing, above market prices for inputs (including above

[26] Block [4] finds that on average 56% of his surveyed CFOs of Fortune 1,000 companies has stockholder wealth maximization as predominant goal. This percentage is much lower than 100% but higher than the results of Petty et al. [44] and Stanley and Block [53] where this percentage was only 11% (of their sample of Fortune 500 Companies) and 21% (of their sample of Fortune 1,000 companies) respectively.

[27] Miller [33] (p.272) states that 'harmful heuristics, like harmful mutations in nature die out. Neutral mutations that serve no function, but do no harm, can persist indefinitely.' Miller [33] (p.273) further argues that a pool of neutral mutations could be of value when the environment changes.

Balance sheet of the levered firm

Pre-tax value existing assets	(PTA)	PV residual claims equityholders	(E)
Pre-tax value growth opportunities	(PVGO)	Debt	(D)
		Employees' Surplus	(ES)
		Other stakeholders' Surplus	(OTS)
		PV government claims	(Gl)
Pre-tax value	(PTV)	Pre-tax value	(PTV)

Fig. 14.3 Adjusted organizational balance sheet in market values

market wages), above market services provided to customers and the community etc.[28] Depending on the theory of the firm, the pre-tax value can be distributed among the different stakeholders following certain "rules." Note that what we call "surplus" in this framework is still based on the "property rights" principle of the firm. Second, only distributions in market values are reflected in this balance sheet. Neutral mutations are not.[29]

Based on the results of Graham and Harvey [18] and common sense we formulate a list of criteria or heuristics that could be integrated into the financing decision framework. Some criteria lead to neutral mutations others do not. We call these criteria "quasi non-economic criteria"; non-economic because the criteria are not based on the neoclassical view. Quasi, because the relations with economic value are not always clear cut. We include criteria that lead to neutral mutations as well, because managers might have good reasons that we overlook or are relevant for other reasons than financial wealth.

The broadest decision framework we propose in this paper is the one that includes both the economic and quasi non-economic variables. Figure 14.4 illustrates the idea. The additional quasi non-economic variables are listed in Table 14.2. This list is far from complete. Relevant variables to be included depend on i) the theory of the firm, ii) characteristics of the particular firm/industry/country and iii) judgment and the preferences of the manager(s).

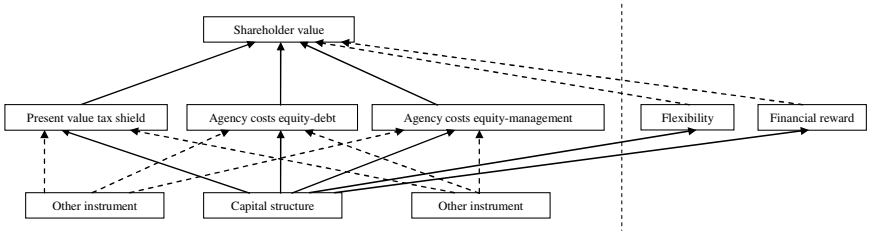

Fig. 14.4 Example of basic idea of possible relations

[28] To a certain extent - as long as debt is not risk free - the firm can expropriate wealth from the debt holders which would result in a broader definition.

[29] Myers [38] defines - after Miller [33] - neutral mutations as financing patterns or habits which have no material effect on firm value and makes managers feel better.

Financial flexibility (excess cash), the first variable in Table 14.2 is valued by managers because it increases their independence from the capital market. Managers may invest more often in projects that do not create shareholder value when they have excess cash or unused debt capacity. For this reason financial flexibility could be relevant for at least employees and the suppliers of resources needed for these projects. As long as managers only would invest in zero net present value projects this variable would have no value effect in the organizational balance sheet. But if it influences the value of the sum of the projects undertaken this will be reflected in this balance sheet. Of course, financial flexibility is also valued for economic reasons, see Section 14.2 and 14.4.

The probability of bankruptcy influences job security for employees and the duration of a "profitable" relationship with the firm for suppliers, customers and possibly the community. For managers (and other stakeholders without diversified portfolios) the probability of default could be important. The cost of bankruptcy is for them possibly much higher than for shareholders with diversified portfolios. As with financial flexibility, the probability of default influences shareholder value as well. In Section 14.2 and 14.4 we discuss this variable in relation to shareholder value. Here the variable is relevant, because it has an effect on the wealth or other "valued" variables of stakeholders other than the equity (and debt) holders.

We assume owner-managers dislike sharing control of their firms with others. For that reason, debt financing could possibly have non-economic advantages for these managers. After all, common stock carries voting rights while debt does not. Owner-managers might prefer debt over new equity to keep control over the firm. Control is relevant in the economic framework as well, see Section 14.2 and 14.4.

In practice, earnings dilution is an important variable effecting the financing decision.[30] Whether it is a neutral mutations variable or not, the effect of the financing decision on the earnings per share is often of some importance.[31] If a reduction in the earnings per share (EPS) is considered to be a bad signal, managers try to prevent such a reduction. Thus the effect on EPS becomes an economic variable. As long as it is a neutral mutation variable, or if it is relevant for other reasons, we treat EPS as a quasi non-economic variable.

The reward package could be relevant for employees. If the financing decision influences the value of this package this variable will be one of the relevant criteria for the manager. If it is possible to increase the value of this package, the influence on shareholder value is ceteris paribus negative. If the reward package motivates the manager to create extra shareholder value compared with the situation without the package, this would possibly more than offset this negative financing effect.

Other criteria that might be relevant are maturity matching, because of liquidity reasons, and the influence of the capital structure on the credit rating of debt.

[30] E.g., Block [4] finds that on average 28% of his surveyed CFOs of Fortune 1,000 companies have 'growth in earnings per share' defined as predominant goal of the firm, and Brav et al. [6] state that three-fourth of their survey respondents (financial executives) indicate that increasing earnings per share is an important factor affecting their share repurchase decision.

[31] In perfect capital markets earnings dilution does not influence the value of equity. This is often misunderstood, see [7], Chapter 32.

Table 14.2 Multiple criteria of capital structure

Category	#	Multiple Criteria
Quasi non-economic values	1	Flexibility (self sufficiency)
	2	Job security
	3	Control
	4	Earnings dilution
	5	Financial reward
	6	Maturity matching, Credit rating etc.

14.4 Capital Structure as Multiple Criteria Decision Problem

Ideally, capital structure decisions are embedded in a capital structure management process, with 1) periodic planned evaluations (e.g. around reporting dates and connected with dividend decisions), 2) events or anticipated events concerning the assets of the company (large investments, mergers and acquisitions, unexpected results) or 3) concerning the liabilities side (changing financial market circumstances, new products offered by the financial industry, refinancing loans etc.). Given the multiplicity of considerations, the large variety of choices and the presence of many contingent claims, both real and financial, make many capital structure decisions unfit for being framed as an optimization problem. In such cases, it does make sense to solicit a variety of solutions by advisors, banks and other providers of capital, which can then be compared in terms of their impact on the criteria considered to be important for the firm concerned.

The factors considered to be important are determined by firm, industry, environmental, country or institutional characteristics. For example, profitability, risk, tangibility of assets, size, growth opportunities of the firm, the competition within and concentration of the industry, the legal system and corporate governance regulations are all more or less important in the selection and weighting of the appropriate criteria.

As an example of capital structure as a multiple criteria decision problem, consider the 100% equity financed firm "OCS." In the coming year OCS has to make an investment and financing decision.[32] Let:

$x =$ new investment in millions of euros;
$y =$ new issue of debt, in millions of euros;
$z =$ new issue of equity, in millions of euros.

Assume the investment generates a perpetual free cash flow of 1 million. Assume for simplicity there are only two financing solutions: 100% debt (plan 1) and 100% equity financing (plan 2). OCS is a listed firm. Managers own 10% of total equity. Assume the unlevered cost of capital is 10% and x is €10 million. The corporate tax rate is 30%. Taxes on a personal level are 0%. OCS has to decide whether she goes

[32] This example is based on Myers and Pogue [43]. For another example, where different financing proposals for an M&A financing problem are compared, see Schauten and Spronk [48].

ahead with the project and if so, whether $y = €10$ million or $z = €10$ million. To support the financing decision OCS evaluates both financing solutions on the criteria listed in Table 14.1 and Table 14.2. If possible, the influence of the financing plans on the criteria is measured in euros. If this is not possible, we only make a qualitative statement. The scores on the economic and quasi non-economic criteria are given in Table 14.3. In this example we choose to score the quasi non-economic variables from the perspective of the manager.[33] The economic variables are scored from the perspective of the shareholders.

Tax shield. The main advantage of debt financing is the reduction of the present value of the government's claim. In general, the higher the proportion interest bearing debt, the higher the PVTS. However, the level of non-debt tax shields [11] and, among others a low level and high variability of earnings could have a negative impact on the PVTS of additional debt. If we assume the profits are high enough to realize the tax shields then the tax shield score on the corporate level of plan 1 is corporate tax rate times the amount of debt, i.e. $0.3 \times €10$ million $= €3$ million.[34] If on the personal level income tax for received interests is higher than for equity income, the advantage on the corporate level could be offset by the disadvantage on the personal level. For now, we assume there are no personal taxes. This implies there is no difference on the criterion "Tax shield on a personal level."

Direct costs of financial distress or the direct bankruptcy costs are the costs of the legal mechanism that allows creditors taking over the assets of a firm when a firm defaults (see [7]). If a firm increases leverage, it increases the probability of default and the present value of the direct costs of bankruptcy. Lenders foresee these costs and foresee that they will pay them if default occurs. Therefore lenders will charge a higher interest rate which reduces both equity cash flows and equity value as a result. If we assume that the risk of the assets in place of OCS is low, and the size of the investment is small relative to the expected free cash flow, the expected probability of default is low. The impact of plan 1 on the direct costs of financial distress then is limited. Of course, plan 2 scores better on this criterion than plan 1.

Agency costs equity-debt. If OCS is not in financial distress, the probability that OCS will play games with the debt holders is small. But if the FCFs are unexpectedly low, it could be that managers on behalf of the existing shareholders try to expropriate wealth from the debt holders. Therefore the agency costs equity-debt are low but positive. Of course the agency costs equity-debt are zero if the investment is financed with an issue of shares.

Non-financial stakeholders. If stakeholders foresee that - because of a higher leverage - the probability of default exceeds acceptable levels, stakeholders could e.g. charge higher prices or buy less products. If the products need a lot of services the value of the assets in place and the value of the new project could be reduced by using an excessive amount of debt. If OCS chooses plan 1 we assume customers will buy less products and employees will charge higher wages. We assume that neither suppliers nor the community is impacted by the financing decision.

[33] It is possible to score the criteria from the perspective of other stakeholders as well.

[34] We assume that the additional amount of debt is fixed and the assets of the project serve as collateral.

Table 14.3 Example scores simplified example "OCS"

Category	#	Multiple Criteria	Scores plan 1 and 2		
			Plan 1	Plan 2	Preference for plan
Panel A: Economic values	1	*Tax shield*			
		- corporate level	€3 million	€0	1
		- personal level	€0	€0	–
	2a	*Direct costs financial distress*	👎	👍	2
	2b	*Agency costs equity-debt*	👎	👍	2
	2c	*Non-financial stakeholders*			
		- customers	👎	👍	2
		- employees	👎	👍	2
		- suppliers	–	–	–
		- community	–	–	–
	3	*Agency costs equity-management*			
		- residual claim	👍	👎	1
		- free cash flow	👍	👎	1
		- control	👎	👍	2
	4	*Following hierarchy*	👍	👎	1
		Flexibility	👎	👍	2
	5	*Signaling*	👍	👎	1
	6	*Subsidy*	–	–	–
Panel B: Quasi non-economic values	1	*Flexibility*	👎	👍	2
	2	*Job security*	👎	👍	2
	3	*Control*	👍	👎	1
	4	*Earnings dilution*	👍	👎	1
	5	*Financial reward*	👍	👎	1

Agency costs equity-management. Under plan 1 the residual claim managers hold remains the same. That means that the price of shirking for the managers remains the same as well. Under plan 2 this price decreases, which means the agency costs caused by a reduction in the residual claim for the managers increases. Under plan 1 free cash flows (FCFs) are reduced because of the promised interest payments. Under plan 2 these FCFs are not reduced. This means that plan 1 scores better on both criteria; residual claim and free cash flow. Given the stake managers have, under plan 1 they could prevent harder possible bidders to take-over the firm. If plan 2 is chosen the stake of the managers dilutes and - we assume - the power of the market for corporate control increases. Plan 2 scores better than plan 1 on the criterion control. The governance structure of the firm, e.g. the way the firm rewards their managers influences the importance of the FCF problem.

Following hierarchy / flexibility. If debt is issued instead of equity the negative impact of mispricing caused by information asymmetry is reduced. However, plan 1 also has a possible negative effect: plan 1 reduces the FCFs, which may negatively influence the future flexibility of the firm. Financial flexibility (excess cash or the preservation of debt capacity) is valued positively because it prevents firms from not investing in positive net present value projects. For example if the net present value of a new project is 1.5 million and the firm has - because of a lack of excess cash,

i.e. a lack of financial flexibility - to issue shares to collect 10 million but are really worth 12 million, the firm will not pursue. It only goes ahead if the net present value of the project is at least 2 million. (See [38], p.584.) The score for plan 1 is relatively good for the aspect hierarchy and bad for expected flexibility.

Signaling. Given information asymmetry it could be argued that if managers have the incentive to always issue the correct signal (that is to tell the truth) an issue of debt could be interpreted as a positive signal about future cash flows [47]. The score for plan 1 then is better than the score for plan 2.

Subsidy. There is no subsidy.

The first quasi non-economic variable flexibility is reduced if managers select plan 1. As under panel A FCF is reduced if debt is issued. If the new project generates positive FCFs then expected flexibility will increase due to an accumulation of free cash.

Job security increases inversely with the probability of default. If the new project contributes to stability of the firm's cash flows the new project could increase job security.

We assume that the managers do not like their stake to dilute. Managers prefer plan 1. This is also in accordance with the control score in Panel A of Table 14.3 where we assume that external shareholders prefer plan 2.[35]

Earnings dilution is higher if new shares are issued. If managers prefer higher earnings per share, plan 1 is favored by managers. Expected earnings increase due to the profitability of the new project, while the number of shares remains the same.

If the financial reward exists - besides the equity stake - of call options, plan 1 again is best. It increases the volatility of equity with a relative positive effect on call options as a result. If plan 2 is implemented the volatility remains the same.[36]

The next step is that the manager evaluates the relative scores on all the criteria and gives his/her own weighting factors to the relevant criteria and then decides which plan is optimal.[37] If the perceived value of all the side effects under the favored plan is positive the manager will go ahead with this project.[38] This simplified "numerical" example shows how complex capital structure problems can be. Even, if we only take the economic criteria into account.

14.5 Summary

The capital structure decision (or rather, the management of the capital structure over time) is never a goal on its own, but should be instrumental to the goal of the

[35] Management could prefer Plan 2 if for instance the power of certain active monitoring shareholders is reduced by a placement of new shares to minority shareholders.

[36] We assume the volatility of the assets remains the same.

[37] MCDA methods that allow the incorporation of quantitative and qualitative criteria could support this decision problem. See Zopounidis [57] for arguments that could justify the use of MCDA methods in investment decisions and portfolio management decisions.

[38] We assume the present value without side effects equals €1 million/0.1=€10 million.

firm. In the traditional case of the firm that strives for the maximization of the value of the shares for the current shareholders, all choices concerning the capital structure should be evaluated in terms of their effect on the firm's market value. No wonder that so much research effort is devoted to the value effects of capital structure decisions. The capital structure decision is often pictured as an optimization problem in which a value function including all costs and benefits is to be maximized, possibly subject to some hard constraints.

We have shown that the management of the firm's capital structure is not that easy at all. The reason is that a number of considerations that enter the capital structure decision and have value implications, cannot be translated into clearly quantifiable costs or benefits that can be entered into the value function or be transformed into hard constraints. Examples discussed include agency costs between equity holders and management (including corporate control and corporate governance), costs of financial distress, benefits and costs for other financial stakeholders, flexibility and even the tax shield. Still these considerations cannot be ignored in the capital structure decision and its economic value implications. Therefore, we propose to translate some of these considerations as separate criteria, which can be traded off against the hard and quantifiable criterion of market value.

Many firms exist that explicitly choose for more objectives than value maximization alone. This may be because the shareholders adopt a multiple stakeholders approach or because of a different ownership structure than the usual corporate structure dominating finance literature. An example of the latter is the co-operation, a legal entity which can be found in, among others, many European countries. So in addition to the criteria that capture the value implications of capital structure decisions, this kind of firms may have other criteria as well. An example is bankruptcy risk and its implications for various stakeholders.

Ideally, capital structure decisions are embedded in a capital structure management process, with 1) periodic planned evaluations (e.g. around reporting dates and connected with dividend decisions), 2) events or anticipated events concerning the assets of the company (large investments, mergers and acquisitions, unexpected results) or 3) concerning the liabilities side (changing financial market circumstances, new products offered by the financial industry, refinancing loans). Given the multiplicity of considerations, the large variety of choices (e.g. all the specifications that can be connected with a loan or with a leasing contract) and the presence of many contingent claims, both real and financial, makes many capital structure decisions unfit for being framed as an optimization problem. In such cases, it does make sense to solicit a variety of solutions by banks and advisors, which can then be compared in terms of their impact on the criteria considered to be important for the firm concerned. The definition of the criteria and the study of the impact of the decision alternatives on these criteria is thus a sine qua non for financial structure decisions.

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