

Optimal Capital Structure: Reflections on Economic and Other Values

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Optimal Capital Structure*

Reflections on economic and other values

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Preliminary

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 & 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. Well-known examples are the interests of customers who receive product or service guarantees from the company. 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.

Keywords: Capital structure, multi criteria decision analysis, MCDA
JEL classification: G30, G32

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Optimal Capital Structure: Reflections on economic and other values

By Marc Schauten & Jaap Spronk¹

1. Introduction

Despite a vast literature on the capital structure of the firm (see Harris and Raviv, 1991, Graham and Harvey, 2001, Brav et al., 2005, for overviews) there still is a big gap between theory and practice (see e.g. Cools, 1993, Tempelaar, 1991, Boot & Cools, 1997). Starting with the seminal work by Modigliani & Miller (1958, 1963), 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. Well-known examples are the interests of customers who receive product or service guarantees from the company (see e.g. Grinblatt & Titman, 2002). Another area that has received considerable attention is the relation between managerial incentives and capital structure (Ibid.). Furthermore, the issue of corporate control² (see Jensen & Ruback, 1983) and, related, the issue of corporate governance³ (see Shleifer & Vishney, 1997), 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 a.o. many European countries. For a discussion on why firms are facing multiple goals, we refer to Hallerbach and Spronk (2002a, 2002b).

In Section 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. The third section describes other objectives and considerations. Some of these may have a clear negative effect on economic value, others may be neutral and in some

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² Corporate Control is defined by Jensen and Ruback (1983) 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.

³ According to Shleifer & Vishney (1997) 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.'

cases the effect on economic value is not always completely clear. Section 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 that are now widely available.

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 positive net present value⁴. Part of shareholder value is determined by the corporate financing decision⁵. 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 Miller and Modigliani (1958) 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 ratio⁶. 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 shares 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. Miller and Modigliani (1958, 1963) show that in a world with corporate tax the value of firms is a.o. 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 1 depicts the total value of an unlevered and a levered firm⁷. The higher leverage, the lower G_l , the higher $G_u - G_l (=PVTs)$.

⁴ This view is seen as an ideal by many; see for example Jensen (2001).

⁵ 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 decisions made by the firm.

⁶ As MM 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." (MM, 1958, p.268-269.)

⁷ See Schauten & Tans (2006) for a derivation of the cost of tax for the government.

Figure 1: Pre-tax value of the firm

Balance sheet of the unlevered firm			
Pre-tax value	(PTV)	PV residual claims equityholders	(E)
		PV government claims	(Gu)
Pre-tax value	(PTV)	Pre-tax value	(PTV)

Balance sheet of the levered firm			
Pre-tax value	(PTV)	PV residual claims equityholders	(E)
		Debt	(D)
		PV government claims	(GI)
Pre-tax value	(PTV)	Pre-tax value	(PTV)

In the traditional trade-off models of optimal capital structure it is assumed that firms balance the marginal present value of interest tax shields⁸ against marginal direct costs of financial distress or direct bankruptcy costs.⁹ Additional factors can be included in this trade-off framework. Other costs than *direct* costs of financial distress are agency costs of debt (Jensen & Meckling, 1976). Often cited examples of agency costs of debt are the underinvestment problem (Myers, 1977)¹⁰, the asset substitution problem (Jensen & Meckling, 1976 and Galai & Masulis, 1976), 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 (Brealey, Myers & Allan, 2006). 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 is the reduction of agency costs between managers and external equity (Jensen and Meckling, 1976, Jensen, 1986, 1989). Jensen and Meckling (1976) 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 (1986) argues that high leverage reduces free cash with less resources to waste on unprofitable investments as a result.¹¹ The agency costs between management and external

⁸ Miller (1977) 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.

⁹ Direct bankruptcy costs are the costs of the use of the legal mechanism allowing creditors to take over a firm when it defaults (Brealey et al., 2006). Direct bankruptcy costs consist of administrative costs and legal fees. Robichek and Myers (1966) and Baxter (1967) suggested that the cost associated with bankruptcy might represent the missing element in the theory of Miller and Modigliani. Miller and Modigliani (1958) 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.

¹⁰ The underinvestment problem is sometimes referred to as the debt overhang problem (Grinblatt and Titman, 2002, p.563).

¹¹ 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 leveraging 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 (Rajan & Zingales, 1995). 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, 2001, p.99). The free cash flow theory is designed for mature firms that are prone to over invest (ibid., p.81).

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' (1984) and Myers and Majluf's (1984) pecking order model¹² there is no optimal capital structure. Instead, because of asymmetric information and signalling problems associated with external financing¹³, firm's financing policies follow a hierarchy, with a preference for internal over external finance, and for debt over equity. 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 Shyam-Sunder & Myers, 1999.) Original examples of signalling models are the models of Ross (1977) and Leland and Pyle (1977). Ross (1977) 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 firms¹⁴. Leland and Pyle (1977) 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. (Copeland, Weston & Shastri, 2005.)

The stakeholder theory formulated by Grinblatt & Titman (2002)¹⁵ 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. Non-financial stakeholders include 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 Brealey, Myers and Allen, 2006, p.481, although the term 'stakeholder theory' is not mentioned) since these stakeholders influence the indirect costs of financial distress.¹⁶

¹² In 1984, the pecking order *story* was not new. Donaldson (1971, 1984) 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.

¹³ The pecking order theory assumes that managers know more about their companies' prospects, risks and values than do outside investors.

¹⁴ 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. (Copeland, Weston & Shastri, 2005.) Miller & Rock (1985) 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.

¹⁵ The stakeholder theory is probably inspired by a.o. Baxter (1967) and Kim (1978) who discuss indirect costs of financial distress.

¹⁶ The stakeholder theory could also explain observed pecking order behaviour in the market. See Grinblatt & Titman, 2002, p. 613.

As the trade-off theory (excluding agency costs between managers and shareholders) and the pecking order theory, the stakeholder theory of Grinblatt and Titman (2002) assumes shareholder wealth maximization as the single corporate objective.¹⁷

Based on these theories, a huge number of empirical studies have been produced. See e.g. Harris & Raviv (1991) for a systematic overview of this literature¹⁸. More recent studies are e.g. Shyam-Sunder & Myers (1999), testing the trade-off theory against the pecking order theory, Kemsley & Nissim (2002) estimating the present value of tax shield, Andrade & Kaplan (1998) estimating the costs of financial distress and Rajan & Zingales (1995) investigating the determinants of capital structure in the G-7 countries. Rajan & Zingales (1995)¹⁹ 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. Barclay & Smith (1995) provide an empirical examination of the determinants of corporate debt maturity. Graham & Harvey (2001) survey 392 CFOs about a.o. capital structure. We come back to this Graham & Harvey study in Section 3.²⁰

Cross sectional studies as by Titman and Wessels (1988), Rajan & Zingales (1995) and Barclay & Smith (1995) and Wald (1999) 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 theory²¹. We do the opposite. We do not analyze the effect of several firm characteristics on capital structure (c.q. leverage), but we analyze 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 1. We will discuss these criteria in more detail in section 4. Figure 2 illustrates the basic idea of our approach.

¹⁷ In the MM 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. (Cools, 1993, p. 261.)

¹⁸ Harris & 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.

¹⁹ Examples of other cross sectional studies before 1991 are: Bradley, Jarrell and Kim (1984), Long and Malitz (1985), Titman and Wessels (1988).

²⁰ For European firms Brounen et al (2004) did a similar survey as Graham & Harvey did for US firms.

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 analyzed. 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. Cools (1993).

Figure 2: Example of basic idea of assumed relations within neoclassical view

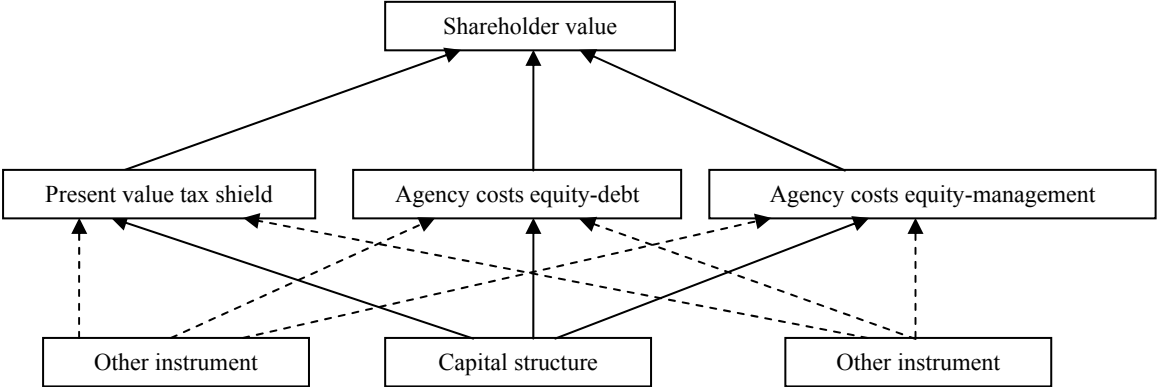


Figure 2 shows that shareholder value is related to the present value of tax shields and with agency costs (both listed in Table 1 as determinants of shareholder value). The financing decision or 'capital structure choice' now is an instrument that influences the value of these determinants. For example, the higher 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 1) on the value determinants as well. For example the decision to acquire assets that could be written of fast, influences the tax benefits of the interest deductibility. The financing decision influences agency costs as well. It could be argued that the agency costs between equity and debt increase with leverage. However, 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.

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 1: Multiple Criteria or determinants of Capital Structure

Category	#	Multiple Criteria	References
Economic values	1	<i>Tax shield</i> - corporate level - personal level	Miller & Modigliani (1958, 1963) Miller (1977)
	2a	<i>Direct costs of financial distress</i>	Miller & Modigliani (1958)
	2b	<i>Agency costs equity-debt</i> - underinvestment - asset substitution (risk shifting) - refusing to contribute equity capital - cash in and run - playing for time - bait and switch	Myers (1977) Jensen & Meckling (1976), Galai & Masulis (1976) Brealey, Myers & Allan (2006) Ibid. Ibid. Ibid. Ibid.
	2c	<i>Non-financial stakeholders</i> - customers - employees - suppliers - community	Grinblatt & Titman (2002) Ibid. Ibid. Ibid.
	3	<i>Agency costs equity-management</i> - residual claim - reduction free cash flow (overinvestment); corporate control shareholders, corporate governance	Jensen & Meckling (1976) Jensen (1986) Jensen & Ruback (1983) Shleifer & Vishney (1997)
	4	<i>Following hierarchy and flexibility (real options)</i>	Myers (1984), Myers & Mailuf (1984)
	5	<i>Signaling</i>	Ross (1977), Leland & Pyle (1977)
	6	<i>Subsidy</i>	

3. Other objectives and considerations

A lot of evidence suggests that managers act not only in the interest of the shareholders (see Myers, 2001). Neither the static trade-off theory nor the pecking order theory can fully explain differences in capital structure. Myers (2001, p.82) states that 'Yet even 40 years after the Modigliani and Miller research, our understanding of these firms²² financing choices is limited.' Results of several surveys (see Cools 1993, Graham & Harvey, 2001, Brounen et al., 2004) 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 US is fairly

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

important in issuing foreign debt decisions²³. Little evidence is found that personal taxes influence the capital structure²⁴. 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 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 choice²⁵.

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 1. Variables of which managers think that they are (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 well²⁶. 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 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 (and pay out an excess amount of cash, if any) 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 either²⁷. Fifth, the neoclassical models are not complete or not tested correctly (see e.g. Shyum-Sunder & Myers, 1999).

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 (2000) argues that companies do not make full use of interest rate tax shields.

²⁵ For European firms Brounen et al (2004, 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 & Harvey (2001) concluded, asymmetric information is not the driving force behind this behavior.

²⁶ Block (2005) 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. (1975) and Stanley and Block (1984) 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 (1977, 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 (1977, p.273) further argues that a pool of neutral mutations could be of value when the environment changes.

Either way, we do expect 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 (2000) 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. Donaldson and Preston, 1995), 'the enlightened stakeholder theory' as a response (see Jensen, 2001), 'the organizational theory' (see Myers, 1993, 2000, 2001) and the stakeholder equity model (see Soppe, 2006).

We introduce an organizational balance sheet which is based on the organizational theory of Myers (1993). 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 3 presents the adjusted organizational balance sheet.

Figure 3: Adjusted organizational balance sheet

Balance sheet of the levered firm			
Pre-tax value existing assets	(PTV)	PV residual claims equityholders	(E)
Pre-tax value growth opportunities	(PVGO)	Debt	(D)
Pre-tax value stakeholders' surplus	(PSS)	Employees' Surplus	(ES)
		Other stakeholders' Surplus	(OTS)
		PV government claims	(GI)
Pre-tax value	(PTV)	Pre-tax value	(PTV)

Pre-tax value is the maximum value of the firm including the maximum value of 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 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 not²⁹.

Based on the results of Graham and Harvey (2001) 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 4 illustrates the idea. The additional quasi non-economic variables are listed in Table 2. This list is far from complete.

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 (1984) defines - after Miller (1977) - neutral mutations as financing patterns or habits which have no material effect on firm value and makes managers feel better.

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).

Financial flexibility (excess cash), the first variable in Table 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. 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 2 and 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 2 and 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 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 2 and 4.

In practice, earnings dilution is an important variable effecting the financing decision. Whether it is a neutral mutations variable or not³⁰, the effect of the financing decision on the earnings per share is often of some importance. 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.

³⁰ In perfect capital markets earnings dilution does not influence the value of equity. This is often misunderstood, see Brealey, Myers and Allen (2006) Chapter 32. Block (2005) 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.

Figure 4: Example of basic idea of possible relations

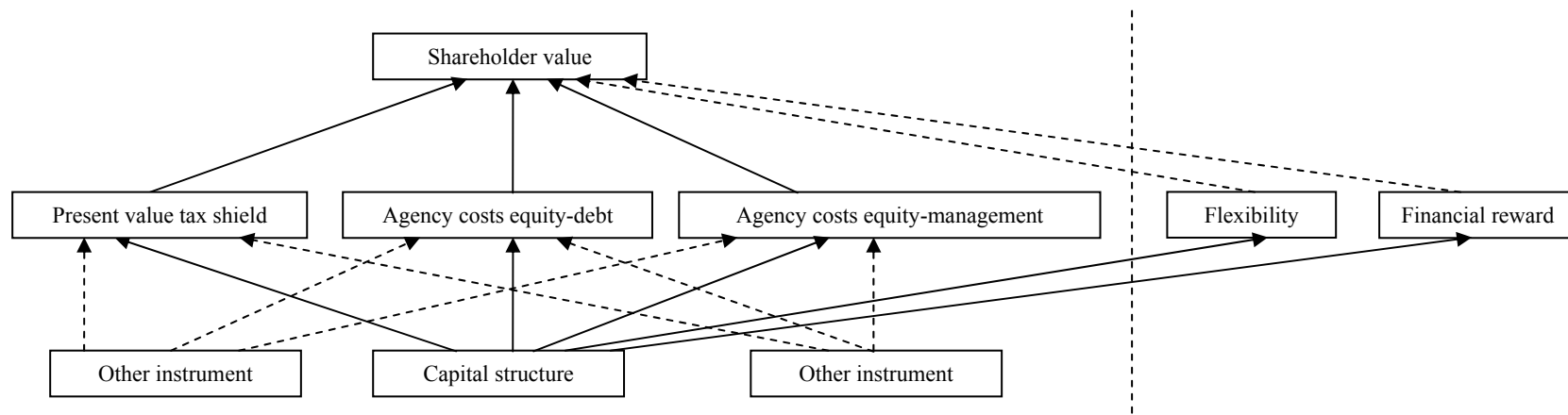


Table 2: Multiple Criteria of Capital Structure

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.

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' which has to decide how much to invest and how to finance the investment in the coming year³¹. 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 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 all criteria listed in Table 1 and Table 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 3. In this example we choose to score the quasi non-economic variables from

³¹ The example is based on Myers & Pogue (1974).

the perspective of the manager³². 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 present value of the tax shield (PVTS). However, the level of non-debt tax shields (DeAngelo and Masulis, 1980) and a.o. 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. $0.3 * € 10 \text{ million} = € 3 \text{ million}$. 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 Brealey, Myers & Allen, 2006). 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 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 small. 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. 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.

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. 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 decreases and 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, the issue of debt

³² It is possible to score the criteria from the perspective of other stakeholders as well.

also has a negative effect. Because FCF (and piled cash if it is not distributed to the shareholders) is reduced, it has a negative impact on the future flexibility of the firm. Financial flexibility (excess cash or preservation of debt capacity) is valued positive 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 Myers, 1984, 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 (Ross, 1977). The score for plan 1 then is better than the score for plan 2.

Subsidy. There is no subsidy.

Table 3: Example scores simplified example

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

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.

Owner managers do not like to share control of their firms with others. However if managers only hold 10% of the shares they do not have a majority vote and do not control the voting during annual meetings of shareholders. If new shares are bought by new shareholders the dispersion of ownership increases which could reduce the power of major (if any) shareholders. This could be positive for managers who need approval for certain actions from the general meeting of shareholders. We assume an issue of equity is positive for the managers because of a decrease in control of existing (major) shareholders³³.

Earnings dilution is higher if new shares are issued. If managers prefer higher earnings per share for some reason, 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 same³⁴.

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 optimal³⁵. If the perceived value of all the side effects under the favored plan is positive the manager will go ahead with this project³⁶. This simplified 'numerical' example shows how complex capital structure problems can be. Even if we only take the economic variables into account.

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 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 in this paper 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

³³ If, as argued under panel A, the market for corporate control is more effective under plan 2, this could be negative for management. Here we assume the net effect from the perspective of management is positive, because under plan 2 managers could pursue more neutral mutation investments.

³⁴ We assume the volatility of the assets remains the same.

³⁵ MCDA methods that allow the incorporation of quantitative and qualitative criteria could support this decision problem. See Zopounidis (1999) for arguments that could justify the use of MCDA methods in investment decisions and portfolio management decisions.

³⁶ We assume the present value without side effects equals € 1 million / 0.1 = € 10 million.

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 a.o. 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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