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Abstract

Developing a new corporate governance paradigm that puts employees or managers in the firms' governance structures, as well as understanding their objective functions and thus the goal of the firm, I investigate the capital structure implications of having employees and managers in control. I argue that employee-governed and manager-governed firms face a limited supply of debt and that they have lower demand for debt compared to firms governed by shareholders. Examining the capital structure decisions of firms from 12 European countries, I provide strong empirical evidence that employee-governed firms operate with lower leverage compared to firms governed by other stakeholders. I documented significant negative correlation of leverage to employees' entrenchment, while I observed weaker effect of employees' ownership rights. In contrast to the expectations, I found that a firm's leverage is generally negatively associated with ownership concentration and the effectiveness of monitoring. As expected, I also found significant differences in the impact of other capital structure determinants in employee-governed firms. Employee-governed firms tend to be less levered at the same amount of earnings volatility than firms governed by other stakeholders. On the other hand, the results do not support the hypothesis that employee-governed firms rely on internal sources to a larger extent and have to pledge more collateral than firms governed by other stakeholders. The results also do not confirm the hypothesis that employee-governed firms choose debt of shorter maturities, or the hypothesis that employee-governed firms face a higher cost of debt.

Keywords: capital structure, leverage, stakeholder-oriented firm, employee-governed firm, manager-governed firm

Povzetek

Na podlagi nove paradigme korporativnega upravljanja, ki vključi v strukture vladanja tudi zaposlene in managerje, kot tudi prepozna njihove cilje in tako tudi cilj poslovanja podjetja, analiziram vplive na odločitve o strukturi kapitala. Sklepam, da so podjetja v katerih vladajo zaposleni in managerji, v primerjavi s podjetji v katerih vladajo lastniki, soočena z manjšo ponudbo dolžniških virov financiranja, poleg tega imajo ta podjetja tudi manjše povpraševanje po dolgu. Z empirično analizo odločitev o strukturi kapitala v podjetjih iz 12 evropskih držav, ugotovim, da so podjetja v katerih vladajo zaposleni manj zadolžena kot podjetja v katerih vladajo drugi deležniki. Rezultati kažejo na negativno povezanost zadolženosti podjetja in utrjevanja zaposlenih in nekoliko manj značilen negativen vpliv lastništva zaposlenih. V nasprotju s pričakovanji, pa rezultati kažejo na negativno povezanost med zadolženostjo in koncentracijo lastništva podjetja oziroma učinkovitostjo izvajanja nadzora. V skladu s pričakovanji, opažam tudi značilne razlike v vplivu ostalih faktorjev, ki vplivajo na odločitve o strukturi kapitala. Podjetja v katerih vladajo zaposleni so pri enaki variabilnosti donosov manj zadolžena. Rezultati pa ne potrjujejo hipoteze, da se podjetja v katerih vladajo zaposleni naslanjajo na uporabo notranjih virov financiranja v večji meri in morajo pri zadolževanju zastaviti več premoženja kot podjetja v katerih vladajo drugi deležniki. Prav tako se podjetja v katerih vladajo zaposleni ne odločajo za več kratkoročnega dolga in se ne soočajo z višjimi stroški dolga.

Ključne besede: struktura kapitala, zadolženost, deležniško usmerjeno podjetje, podjetje v katerem vladajo zaposleni, podjetje v katerem vladajo managerji

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Introduction

1.1 Motivation

Corporate capital structure decisions is today one of the most extensively researched topics in corporate finance. Modern capital structure theory that has developed in the last 50 years proposed various factors to explain capital structure choice. One of the seminal contributions, made by Modigliani and Miller (1963), identified taxes as the main driver for the use of debt financing, while the following research try to answer why the interest tax shields provided by debt do not lead firms to borrow as much as possible. Modigliani and Miller (1963), for example, suggested that firms maintain reserve borrowing capacity and that the incremental tax advantage of debt declines as more debt is issued and interest tax shields become less certain. Miller (1977) argued that the gain from leverage falls significantly if personal taxes are taken into account; moreover, he showed that at equilibrium the tax benefits to the firm are exactly offset by personal taxation, and that the gain from leverage completely vanishes. DeAngelo and Masulis (1980) considered tax shields other than interest payments, such as accounting depreciation, depletion allowances, and investment tax credits. Others have acknowledged bankruptcy costs and argued that optimal capital structure is defined by the trade-off between the value created by the interest tax shield and the value lost from bankruptcy costs. More recent literature has focused on agency costs and asymmetric information. Assuming that managers do not always act in the best interest of shareholders, the agency cost theory emphasizes the role of debt as a disciplining device. By increasing debt, shareholders reduce the free cash flow problem (Jensen, 1986) but, on the other hand, cause asset substitution (Jensen and Meckling, 1976) and suboptimal investment (Myers, 1977). Models based on asymmetric information hypothesize that capital structure choice can change the market perception and affect a firm's value. Myers (1984) showed that a firm's financing process follows a pecking order, forcing the firm to exhaust internal sources first and, when external sources are required, to first issue debt, while issuing equity capital only as a last resort.

However, empirical evidence suggests that modern capital structure cannot sufficiently explain firms' capital structure decisions. Empirical evidence clearly indicates substantial tax effects (Mackie-Mason, 1991; Graham, 1996; Masulis, 1980; Kemsley and Nissim, 2002), bankruptcy costs (Warner, 1977; Altman, 1984; Opler and Titman, 1994; Bradley et al., 1984), agency cost considerations (Long and Malitz, 1985), and mean reversion in debt ratios (Taggert, 1977; Marsh, 1982; Auerbach, 1985; Julilvand and Harris, 1984; Opler and Titman, 1994; Hovakimian et al., 2001; Flannery and Rangan, 2006). In addition, there are several important contributions in favor of the pecking order hypothesis (Shyam-Sunder and Myers, 1999; Bharath et al., 2008). Meanwhile, Welch (2004) found that firms do not issue and repurchase debt and equity to

counteract the mechanistic effects of stock returns on their debt-equity ratios and argued that stock returns are the primary determinant of capital structure and capital structure change. However, empirical evidence shows that firms' leverage is well beyond the levels suggested by modern capital structure theory and that little of the variation in leverage is captured by the proposed determinates. As found by Lemmon and Zender (2001), firms pursue very conservative financial policies and their debt ratios exhibit significant stability over time. Lemmon et al. (2006) found that little of the variation in leverage is captured by previously identified determinates and that the majority of variation in debt ratios is driven by unobserved time-invariant effect. Thus something must be wrong with modern capital structure theory.

Modern capital structure theory assumes that firms are governed by shareholders, their goal thus being to maximize the value of the firm. If this is true, one would find firms operating with leverage and making capital structure decisions, as proposed by modern capital structure theory. I argue that firms' leverage is well beyond the levels suggested by modern capital structure theory and that little of the variation in leverage is captured by the proposed determinates because firms are generally not governed by shareholders and modern capital structure theory was developed on a false assumption about the goal of the firm. It is becoming widely believed that a firm's behavior is also significantly affected by other stakeholders, such as managers and employees. The firm's objective function thus often deviates from the concept of value maximization. Therefore, to develop a theory that will be able to explain capital structure choice, one first has to consider corporate governance issues, and first ask what the firm is, who governs the firm, what the objective functions of the stakeholders in control are, and what the goal of the firm is.

Just a glance over corporate governance systems around the world suggests that there are stakeholders other than shareholders that affect firms' behavior. In Germany, for example, the legal system is quite explicit that firms do not have the sole duty of pursuing the shareholders' interests. A system of codetermination enables employees' active participation in the firm's decision-making process. Germany is by no means the only country where one can expect firms' behavior to deviate from the concept of value maximization. There is also the new theory of the firm, which identifies alternative sources of power within the firm. According to the property rights theory, power stems from ownership of physical assets. Hence, the firm is nothing but a collection of physical assets. It is no surprise then that there was no room for stakeholders other than shareholders in the existing theory of the firm, given that people cannot be owned. Of course, ownership of physical assets is not the only source of power within the firm. Rajan and Zingales (1998), for example, argued that power stems from control over a critical resource and that the main mechanism to allocate power is access; that is, the ability to use or work with a critical resource. An agent that is given privileged access to a resource receives no residual rights of control, but the opportunity to specialize his human capital to the resource and make himself valuable. Highlighting alternative sources of power, the new theory of the firm defines the firm in terms of unique assets, as well as in terms of people that have access to the critical resources.

Moreover, it brings stakeholders other than shareholders within the boundaries of the firm. In contrast to the property rights theory, the new theory of the firm considers managers as well as employees as an important part of the firm.

Developing a new corporate governance paradigm that put employees or managers in the firms' governance structures, as well as understanding their objective functions and thus the goal of the firm, one could easily see why firms follow conservative capital structure policies and that there are other channels through which capital structure decisions are affected. If the firm is employee-governed, the firm is aimed at maximizing wages and minimizing the probability of bankruptcy. Being aware of employees' limited horizon, compared to those of the shareholders, employees' objectives are more short-term oriented; moreover, their objectives are characterized by higher risk aversion. Managers maximize utility stemming from wages and pecuniary and non-pecuniary benefits, and only then the value of the firm that affects their compensation. However, in practice they end up maximizing revenues or growth of the firm. Because they are aware that their reputations are at stake when running firms, their objectives favor firm survival. This corresponds to maximizing the revenues and the growth of the firm.

1.2 Methodology

Recognizing the weakness of modern capital structure theory and hypothesizing about the reason that it has failed, I first analytically develop a new corporate governance paradigm. Surveying the literature, I review corporate governance systems around the world to show that stakeholders other than shareholders significantly affect the behavior of the firm, while using the findings of the new theory of the firm (Rajan and Zingales, 1998; Aghion and Tirole, 1997) to provide theoretical foundations for a new definition of the firm. Using option pricing theory developed by Black and Scholes (1973) and Merton (1973, 1974), I derive the claims of various stakeholders, define their objective functions, and hypothesize about the goal of the stakeholder-oriented firm.

Because I am familiar with the objective functions of employee-governed and manager-governed firms, I investigate the capital structure implications of having employees and managers in control. Using credit-rationing models developed by Jaffe and Russell (1976), Keeton (1979), and Stiglitz and Weiss (1981, 1983), I study the supply of debt to employee-governed and manager-governed firms. I hypothesize about the demand for debt, bearing in mind the specific objective functions and risk aversion of employee-governed and manager-governed firms, as well as using existing research.

I provide evidence of the capital structure implications of having employees in control by conducting an empirical study. The empirical study addresses firms from countries with different legal environments; that is, countries in which the legal system is based on the common and civil

law tradition. I consider firms from the following western European countries: France, Germany, Sweden, the United Kingdom (UK), as well as five central and eastern European countries: the Czech Republic, Hungary, Poland, Slovakia, and Slovenia, and the three Baltic states: Estonia, Latvia, and Lithuania (CEB). The capital structure implications of having employees in control are investigated using panel data regression analysis.

1.3 Contribution and limitations

By investigating capital structure decisions in firms governed by stakeholders other than shareholders, I contribute to the scarce literature available in this area. I investigate capital structure decisions in employee-governed and manager-governed firms, studying the supply of debt and demand for debt. Normally, supply-side and demand-side forces are not distinguished in capital structure research, thus I provide a novel approach that could provide new insights into firms' financial behavior. Moreover, I provide strong empirical evidence of the capital structure implications of having employees in control. Last but not least, I provide a detailed survey of corporate governance systems around the world, as well as the new theory of the firm, and develop a new corporate governance paradigm that reflects stakeholder-oriented firm. I derive the claims of various stakeholders and define their objective functions and hypothesize about the goal of the stakeholder-oriented firm.

The main limitation relates to the inability of the proxy used to approximate employees' entrenchment, which nonetheless proved that this can explain conservative financial behavior, explaining a time-invariant permanent component that is a primary determinant of a firm's leverage. I believe that by more accurately approximating employees' entrenchment one could explain more of this time-invariant permanent component. Other limitations relate to the abilities to draw conclusions about the effects of employees' ownership rights and ownership concentration, which results from using a database, which is not the most appropriate for analyzing ownership structures.

1.4 Structure

This dissertation is structured as follows. Chapter 2 reviews modern capital structure theory and empirical evidence on capital structure choice, as well as the underlying theory of the firm. Chapter 3 discusses stakeholder-oriented firms. First, surveying corporate governance systems around the world and reviewing the new theory of the firm, I develop a new corporate governance paradigm. Then, deriving the claims of various stakeholders and defining their objective functions, I hypothesize about the goal of the stakeholder-oriented firm. Chapter 4 investigates the capital structure implications of having employees and managers in control. I

study the supply of debt and demand for debt in employee-governed and manager-governed firms. Chapter 5 presents an empirical study of capital structure decisions in employee-governed firms.

2 Modern capital structure theory

Reviewing modern capital theory, one would conclude that this field, which was little more than a collection of "recipes" reflecting practitioners' common sense 50 years ago, is one of the most extensively researched topics in corporate finance today. There are two competing theories representing modern capital structure theory today. One is the trade-off theory and the other is the pecking order hypothesis. According to the trade-off theory, a firm finds its optimal capital structure by trading off the benefits of debt (i.e., tax benefits and the ability of debt to reduce agency costs of debt) with the costs of debt (i.e., bankruptcy cost and agency costs of debt). The pecking order model, on the other hand, hypothesizes that because of asymmetric information a firm's financing process follows a specific order and that firms first exhaust internal sources and, when external sources are required, first issue debt, but that they issue equity capital only as a last resort. According to the pecking order hypothesis, there is no optimal capital structure.[1]

Unsuccessful striving to sufficiently explain capital structure decisions in the last 50 years and the recent dramatic holdup in the development of the capital structure theory suggest that we are either at a standstill because we are unable to understand the complex environment in which firms operate today, or we are on the wrong track. It is my hypothesis that we lost our way at the very beginning by making a wrong assumption about the goal of the firm. Therefore, to push the development of the capital structure theory forward, we have to go back to its core assumption and first ask ourselves again what the firm actually is, who governs the firm, and what the objective function of the stakeholder in control is and thus the goal of the firm.

Being aware that the capital structure theory is deeply rooted in the theory of the firm, I first review the underlying theory of the firm. Despite the understanding of the firm substantially developed so far, modern capital structure theory, no matter how the firm is defined, still assumes that the firm is governed by shareholders, its goal thus being to maximize the value of the firm and thus their wealth. Then I review modern capital structure theory and empirical evidence on capital structure choice to show its inability to explain capital structure decisions in practice.

2.1 The theory of the firm and shareholder value

The earliest literature on the theory of the firm, referred to as the neoclassical theory, looked at the firm in technological terms. The first step in expanding the focus and recognizing that

[1] There is an excellent survey of modern capital structure theory in Harris and Raviv (1991). Although their survey was carried out almost 20 years ago and there have certainly been important contributions afterwards, recent contributions have mostly been empirical and have not undermined their underlying conceptual framework.

something more than a black box represents the firm was made by Coase (1937). He focused on why a hierarchical relationship, with some individuals having authority to make decisions about how resources are used, might be substituted for market transactions. He argued that activities would be included within the firm whenever the costs of using markets are greater than the cost of using direct authority. Coase (1937) characterized the bounds of the firm as the range of exchanges over which the market was suppressed and resource allocation was instead accomplished by authority and direction.

Later on, economists took the theory of the firm in two different directions. One approach – the agency costs theory – justified the existence of the firm on the benefits of team production and focused on the agency problem and the resulting agency costs. According to Alchian and Demsetz (1972), the problem raised by team production is one of metering individual output and issuing rewards so as to motivate team members to exert effort. Benefits arise if individuals can accomplish more by working together than by working separately, meaning whenever extra productivity exceeds the costs of monitoring and motivating. Despite Alchian and Demsetz (1972) objected to the notion that activities within the firm are governed by authority and emphasized the role of contracts as a vehicle for voluntary exchange, Jensen and Meckling (1976) argued that their emphasis was too narrow. Jensen and Meckling (1976) argued that contractual relations are the essence of the firm and that the firm should be viewed as a contracting mechanism between providers of capital (shareholders) and managers, designed so as to minimize agency costs in this relationship. Jensen and Meckling (1976) defined the firm as a legal fiction that serves as a nexus for a set of contracting relationships among individuals.

The other approach – the property rights theory – continued Coase's tradition and focused on the transaction costs of organizing activities through market transactions. Williamson (1975, 1985) identified several features of transactions that make it costly to trade in impersonal arms-length markets. Where these features apply, transacting parties might choose to administer such transactions through hierarchical governance arrangements. The key feature is the asset-specificity of investment, which refers to the difficulty of redeploying assets to other uses. Klein et al. (1978) argued that, when two contracting parties each make investments that are specific to their relationship, either party can attempt to expropriate the returns from those investments by threatening to "hold up" the other party. This potential "holdup" problem encourages the contracting parties to integrate their operations vertically. Moreover, Grossman and Hart (1986) argued that ownership rights, and thus the residual rights of control, should go to the party whose relationship-specific investments add the most value but are most difficult or impossible to contract over because it provides some assurance to the party that makes these investments that its claim to a share in the rents generated by the investments will not be expropriated by the other party. According to these arguments, a firm is a well-defined entity whose interests are simply an extension of the interests of its owners. Grossman and Hart (1986) define the firm as a bundle of

assets under common ownership in which ownership implies control over the use and disposition of the assets.

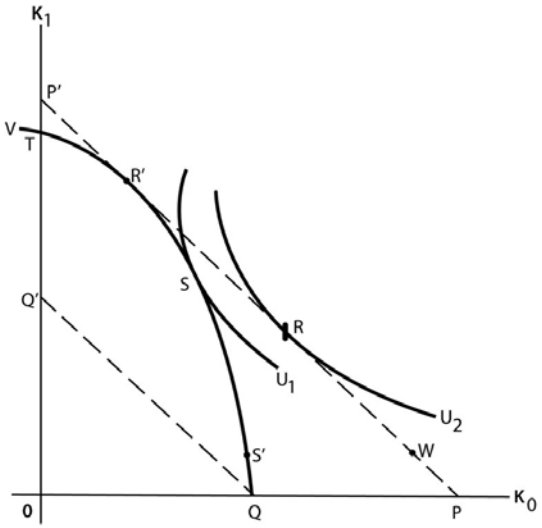
2.1.1 The earliest neoclassical theory

The earliest literature on the theory of the firm, referred to as the neoclassical theory, looked at the firm in technological terms. The firm is viewed as a black box, represented by a production function that specifies the output level that can be obtained given the level of inputs. It is assumed that the firm is run in the shareholders' interests by a selfless manager that chooses the input and output levels to maximize profits. It is no surprise then that it is assumed that the goal of the firm is to maximize the value of the firm and thus shareholders' wealth.

In order to formally derive the goal of the firm, let us begin with Fisher's solution to the problem of investment decision (Fisher, 1930). Consider a case in which a rational individual, who maximizes the utility of consumption, has to decide on his optimal time pattern of consumption within the available opportunities. Assume that the individual has an income that enables him to consume K_0 in period 0 or to delay part of consumption until period 1. There is a given rate at which the individual or the firm can borrow and lend.

His opportunity set is depicted in Figure 2.1, in which the horizontal axis labeled K_0 represents the amount of income available for consumption or simply consumption in period 0, and the vertical axis labeled K_1 the consumption in period 1. He may choose points on either axis, such as points Q and Q', representing consuming all the income available in period 0 in period 0 (Q), or lending all the available income in period 0 and thus consuming the amount Q', which is paid back in period 1 in period 1 ($Q' = Q(1 + r)$). He can also pick one of the points on the market line QQ', thus consuming some of the amount available in period 0 in period 0, lending the rest, and consuming what is repaid in period 1 in period 1.

Figure 2.1: Fisher's solution (adopted from Hirshleifer, 1958)



In addition to market opportunities, which transfer income from one period to another through lending and borrowing, the individual also has real investment opportunities. The range of productive opportunities available to the individual falls on the curve *QSTV*. Concavity to the origin represents diminishing investment returns.

Assuming that the individual has a preference function, relating income in period 0 and income in period 1 through indifference curves, U_1, U_2, and so forth, he maximizes the utility of consumption by picking the point on the market line or the curve of productive opportunities that touches the highest indifference curve. Moving along productive opportunity curve *QSTV*, he sees that the highest indifference curve that can be obtained is at point *S*. However, this is not the highest attainable point because he can move further to point *R* along the market line *PP′* by additional borrowing.

Formally, the problem of maximizing an individual's utility function $U(C)$ at the restriction on the present value of total consumption, $V(C) = V(C_0) + V(C_1)$ and the restriction on productive opportunities, $T(C_0) = 0$, can be written as:

$$\max_{C,W}\left[U(C)-\lambda_1\left(V(C)-V(C_0)-V(C_1)\right)-\lambda_2 T(C_0)\right],$$

which, setting $\lambda_3 = \lambda_2 / \lambda_1$, can be rewritten as:

$$\max_C \left[U(C) - \lambda_1 \left(V(C) - V(C_0) \right) - \lambda_1 \max_W \left(V(C_1) - \lambda_3 T(C_0) \right) \right].$$

It follows that the individual attains a solution to the problem of the investment decision in two steps. A productive solution is reached when the marginal investment rate of return equals the borrowing/lending rate, while only then does the individual satisfy his time preferences of consumption by moving along the market line by borrowing or lending; that is, by making a financing decision.

Using Fisher's approach, Hirshleifer (1958) showed that under the assumption of certainty and the existence of a perfect capital market a firm provides maximum utility of consumption to its shareholders when it chooses its investment strategy so as to maximize the value of the firm. Debreu (1959) and Arrow (1964) extended this analysis to uncertainty and arrived at the same conclusion, and thus argued that the capital market provides a Pareto-optimal allocation of resources.[2] These extremely appalling results concerning the proposed investment criteria and thus the goal of the firm soon flooded modern corporate finance theory.

However, later on Jensen and Long (1972) and Stiglitz (1972) demonstrated that investment allocation by value-maximizing firms through a competitive capital market is not generally Pareto-optimal. These findings led to a controversy over whether the sources of the nonoptimality of value maximization are noncompetitive assumptions about the capital market used in existing research, or are inherent externalities associated with uncertainty that do not disappear even in a competitive market. Merton and Subrahmanyam (1974) argued that the sources of nonoptimality are nonprice-taking behavior of firms, restrictions on the availability of technologies, and restrictions on the number of the firms that can enter the market. They showed that if the firms maximize value and act as price takers, then the allocation is always Pareto-optimal, whereas relaxing restrictions on the availability of technologies and restrictions on the number of firms that can enter the market led to Pareto-optimum in most cases. Moreover, Merton and Subrahmanyam (1974) showed that in no case will the aggregate amount of investment be less than the Pareto-optimal amount.

Apart from efficiency aspects, a serious weakness of the neoclassical theory is that it completely ignores incentive problems within the firm. As noted, the firm is treated as a black box, within which everything operates perfectly smoothly and everybody does what he is told. Even a glance at any firm suggests that this is very unrealistic. The agency cost theory, which started to emerge

[2] However, they make a restrictive assumption that there exists a complete set of contingent commodities, meaning that there are at least as many securities available on the stock market as states of nature.

in the 1970s, tried to rectify these pitfalls. However, only recently, with advances in the property rights theory, have plausible formal results been obtained.

2.1.2 The agency costs theory

The agency costs theory recognizes that stakeholders' interests within the firm are not aligned. Shareholders want managers to maximize the value of the firm and thus their wealth when running the firm. However, managers seek to maximize their own utility and their decisions often reflect their personal interests rather than those of the shareholders. As noted by Jensen and Meckling (1976), most organizations are simply legal fictions that serve as a nexus for a set of contracting relationships among individuals. The firm is just one form of these legal fictions, which is also characterized by the existence of divisible residual claims on the assets and cash flow of the organization, which can generally be sold without the permission of the other contracting individual. As argued by Jensen and Meckling (1976), viewing the firm as the nexus for a set of contracting relationships among individuals does not allow us to personalize the firm. Therefore, asking questions such as what the goal of the firm is are seriously misleading. The firm is not an individual, but a legal fiction that serves as a focus for a complex process in which the conflicting objectives of individuals are brought into equilibrium within a framework of contractual relations.

The essential element of the contractual view of the firm is the agency problem, introduced by Coase (1937) and further developed by Jensen and Meckling (1976) and Fama and Jensen (1983a, b). The agency problem results from separation of ownership and control and asymmetric information characterizing this relationship. In general, the agency problem arises in any relationship in which a person that has limited information available (the principal) employs another well-informed person (the agent) to perform some service on his behalf. If both parties are utility maximizers, it is can be expected that the agent will not always act in the best interests of the principal. Of course, the principal can limit divergence from his interests; however, contracts are not costlessly written and enforced. Agency costs refer to reduction of the principal's welfare and include the costs associated with activities aimed at limiting the agent's divergent behavior, such as monitoring and managerial incentives. In addition, the principal realizes a residual welfare loss because no such mechanism exists that will limit the agent's divergent behavior and change his behavior so that his activities will coincide with the interests of the principal. In the firm's context, the agency problem arises when the entrepreneur or manager (agent) raises funds from investors (principals) and refers to the difficulties investors deal with, as well as the cost they bear, in ensuring that the return on their investments is earned and paid out.

Despite managers' fiduciary duty and legal protection of shareholders' interests, as well as sophisticated monetary incentives, monitoring, and other corporate governance mechanisms, managers expropriate investors' wealth. Managerial expropriation takes different forms. Managers consume perquisites, such as luxury offices, corporate jets, and club memberships, they build empires or pursue their pet projects, they pay inflated prices to affiliated entities, and they entrench themselves and stay on the job even if they are no longer competent or qualified to run the firm. There is ample empirical evidence documenting the high agency cost associated with managers' behavior, which often reflects their personal interests rather than those of investors. Shleifer and Vishny (1997) cited studies finding that managers prefer to reinvest free cash flow rather than return it to investors (Jensen, 1986), studies documenting negative bidder returns (Roll, 1986), especially if managers hold little of the firm's equity (Lewellen et al., 1985) and when bidders diversify (Morck et al., 1990; Bhagat et al., 1990; Lang and Stulz, 1994; Comment and Jarrell, 1995), studies finding management resistance to takeovers to protect their private benefits rather than serve their shareholders (Walking and Long, 1984; De Angelo and Rice, 1983; Jarrell and Poulsen, 1988; Ryngaert, 1988; Malatesta and Walking, 1988), and, last but not least, a great deal of evidence documenting how investors value control (Barclay and Holderness, 1989, 1992; Lease et al., 1983, 1984; DeAngelo and DeAngelo, 1985; Zingales, 1994, 1995; Levy, 1982; Rydqvist, 1987; Horner, 1988; Barca, 1995).

It is thus expected that managerial incentives, as well as other corporate governance mechanisms, are designed to satisfy the conditions of efficiency. Because these activities are not costless, one cannot expect firms to be run so as to maximize their values. As argued by Jensen and Meckling (1976), the difference between an efficient solution under zero agency costs and the value given to positive agency costs is total gross agency costs. From their point of view, the finding that agency costs are positive and arguing that the agency relation is non-optimal and inefficient is equivalent to comparing a world in which iron ore is a scarce commodity, and therefore costly, to a world in which it is freely available at zero cost and concluding that the first world is non-optimal. Moreover, Jensen and Meckling (1976) argued that only if one can establish the existence of a feasible set of alternative institutional arrangements that would yield a reduction of the agency costs could one legitimately conclude that the agency relationship is not Pareto-optimal. Fama and Jensen (1983b) argued that the separation of ownership and control – or the separation of decision making and risk bearing, as they called it – survives because of the benefits of specialization of management and risk bearing, as well as effective approaches to controlling the agency problems available.

2.1.3 The property rights theory

In contrast to the agency cost theory, which views the firm as the nexus for a set of contracting relationships among individuals, the property rights theory identifies the firm with assets under

common ownership, in which property rights imply control over the assets. Seeing the relationship between the entrepreneur or manager and the investors as dynamic rather than static, one observes that investors cannot assure themselves that managers will not expropriate their wealth by signing a complete contract that specifies required managerial responses in all possible events because foreseeing all future contingencies is impossible. A key question that arises with the incomplete contract is how future decisions are made. Literature on incomplete contracting, which substantially developed property rights theory, takes the view that a decision-making process must be chosen in advance. One way to do this is through the allocation of the control rights that stem from ownership or property rights. Grossman and Hart (1986), Hart and Moore (1990), and Hart (1995) argued that control rights are important because they influence relationship-specific investments, while Aghion and Bolton (1992), Hart and More (1998), and Tirole (2001) argued that the allocation of control rights affects the trade-off between cash flows and private benefits once the relationship is underway and influences financing.

Hart (1995), building on the ideas of Grossman and Hart (1986) and Hart and Moore (1990), analyzed the costs and benefits of integration. He considered a simple model in which there are two assets, a_1 and a_2, and two managers, M_1 and M_2. He assumed that M_2, in combination with a_2, supplies input to M_1, and that M_1, in combination with a_1, uses this input to produce the output. Analyzing the optimal ownership structure in light of the surplus generated by both parties from the relationship and their investments made, he argued that if M_2's investment decision is inelastic or its investment becomes unproductive, then an integration in which M_1 owns a_1 and a_2 is optimal because it does not make sense to give ownership rights to the party whose investment decisions are not responsive to incentives or to the party whose investments are unimportant (and vice versa). If assets a_1 and a_2 are independent, he argued that non-integration is optimal, whereas if assets a_1 and a_2 are complementary some form of integration is optimal. If M_1's human capital is essential, then an integration in which M_1 owns a_1 and a_2 is optimal (and vice versa), whereas if both parties' human capital is essential then all ownership structures are equally good.

On the other hand, Tirole (2001), synthesizing the ideas of Aghion and Bolton (1992), Hart and More (1995), and Hart and More (1998), argued that transfer of control rights to investors facilitates financing by increasing the income that can be pledged to investors. Consider a risk-neutral entrepreneur that has a project that requires external financing. The project involves investment I and the entrepreneur has insufficient equity to finance the project, $A < I$. It is assumed that the entrepreneur is protected by limited liability, meaning that his income cannot take negative values, and that the parties do not discount the future. The project generates some verifiable income or profit at the end, and takes value R if the project turns out to be a success and 0 if the project fails. The probability of success is p, which must be endogenous if the agency problem arises. The probability of success is p_H if the entrepreneur behaves, and $p_L = p_H - \Delta p$, where $\Delta p > 0$, if he misbehaves. The entrepreneur may choose to misbehave because he enjoys

some private benefits $B > 0$ if he misbehaves (the entrepreneur does not enjoy private benefits if he behaves).

The scope for financing the project is created if the project's NPV is positive, thus $p_H R - I > 0$. However, a positive NPV is not enough for investors to finance the project. The project is worth financing only if the financial contract induces the entrepreneur to behave. Because of possible entrepreneur misbehavior, some compensation w that compensates the entrepreneur in the case of success (being 0 in the case of failure) must exist, in order to induce the entrepreneur to forgo the private benefits of misbehaving: $(p_L - p_H)w \geq B$. This means that the entrepreneur must be given a share of return, thus the investors' return being equal to $R - [B / (p_L - p_H)]$. A necessary and sufficient condition for financing is that the income that can be pledged to investors exceed investors' outlay:

$$p_H\left(R - \frac{B}{p_H - p_L}\right) \geq I - A\,.$$

Suppose also that an interim action can be taken by the controlling party that raises the probability of success uniformly by $\tau > 0$, as well as engenders some private costs $\gamma > 0$ for the entrepreneur (or, more generally, insiders). The interim action can consist, for example, of laying off employees, divesting some of the manager's pet projects, and so on.

Because the allocation of control is a trivial issue when investor control is first-best optimal – that is, when $\tau R > \gamma$ – let us consider the case in which the profit-enhancing action reduces aggregate welfare and is thus first-best suboptimal, thus $\tau R < \gamma$.[3] In order to show that the transfer of the control rights to investors increases NPV and/or facilitates financing by increasing the income that is pledgeable to investors, one should compare the project's NPV and pledgeable income when the control is retained by the entrepreneur to the pledgeable income obtained if the control is transfer to the investors.

If the entrepreneur does not relinquish control, it can be expected that he does not take a profit-enhancing action because he bears the entire cost and receives only part of the benefits ($w \leq R$ and $\tau w < \gamma$). The project's NPV, not taking a profit-enhancing action, is thus equal to:

$$p_H R - I,$$

[3] When investor control is first-best optimal, NPV increases from $p_H R - I$ to $(p_H + \tau)R - I - \gamma$ and the pledgeable income from $p_H\left(R - \frac{B}{p_H - p_L}\right)$ to $\left(p_H + \tau\right)\left(R - \frac{B}{p_H - p_L}\right)$.

and the pledgeable income:

$$p_H\left(R-\frac{B}{p_H-p_L}\right).$$

On the other hand, because investors share part of the profit and bear none of the cost of a profit-enhancing action, they would decide to take profit-enhancing action if they were given control. The project's NPV is thus equal to:

$$(p_H+\tau)\mathrm{R}-I-\gamma,$$

and the pledgeable income:

$$(p_H+\tau)\left[R-\frac{B}{(p_H+\tau)-(p_L+\tau)}\right]=(p_H+\tau)\left(R-\frac{B}{p_H-p_L}\right).$$

Comparing the outcomes:

$$p_H R-I>(p_H+\tau)\mathrm{R}-I-\gamma \text{ and}$$

$$p_H\left(R-\frac{B}{p_H-p_L}\right)<(p_H+\tau)\left(R-\frac{B}{p_H-p_L}\right),$$

thus provides the second argument in favor of shareholder value, more precisely, investor value because no distinction between different types of investors has been made. As expected, the transfer of the control rights to investors in this case reduces the project's NPV, but increases the pleadgeble income. When the entrepreneur has insufficient capital to finance the project, and because a substantial initial investment by investors requires sufficient pledgeable income, the entrepreneur is forced to give up control rights to the investors. The first-best suboptimal choice can thus be second-best once imperfections on the credit market are accounted for.

2.2 Modern capital structure theory

In the seminal paper, Modigliani and Miller (1958) made several restrictive assumptions, such as that there are no taxes, bankruptcy costs, agency costs, and information asymmetry, and argued that a firm's capital structure is irrelevant to the firm's value and its cost of capital. However, only five years later, acknowledging tax savings generated by debt, they published a corrected

argumentation and concluded that leverage increases a firm's value (Modigliani and Miller, 1963). Based on their findings, one can conclude that a firm's value is maximized at 100 percent debt financing. It is no surprise that most of the further development of modern capital structure theory was aimed at resolving the controversy over why the tax benefits of debt do not lead firms to borrow as much as possible. Various ideas were put forward to solve the optimal capital structure puzzle.

The first arguments were already provided by Modigliani and Miller (1963), who warned that their findings do not necessarily mean that a firm should always seek the maximum possible amount of debt. If personal taxes are taken into account, retained earnings might be cheaper. Moreover, they considered a firm's need to preserve flexibility and to thus maintain reserve borrowing capacity. Miller (1977) argued that the gain from leverage falls significantly if personal taxes are taken into account; moreover, he showed that at equilibrium the tax benefits to the firm are exactly offset by personal taxation and the gains from leverage completely vanish. DeAngelo and Masulis (1980) considered other tax shields than interest payments, such as accounting depreciation, depletion allowances, and investment tax credits. Meanwhile, others acknowledged bankruptcy costs and argued that optimal capital structure is defined by the trade-off between the value created by the interest tax shield and the value lost from bankruptcy costs.

More recent literature has focused on agency costs and asymmetric information. Assuming that managers do not always act in the best interest of the shareholders, the agency cost theory emphasizes the role of debt as a disciplining device. By increasing debt, shareholders reduce the free cash flow problem (Jensen, 1986), but on the other hand cause asset substitution (Jensen and Meckling, 1976) and suboptimal investment (Myers, 1977). Models based on asymmetric information hypothesize that capital structure choice can change the market perception and affect a firm's value. Myers and Majluf (1984) showed that if a firm finances new projects by issuing equity, underpricing may be so severe that even positive NPV projects are rejected. The underinvestment problem is mitigated by financing projects through internal sources or issuing debt, which is less underpriced by the market. Therefore, it is expected that the firm's financing process follows a specific order, forcing the firm to exhaust internal sources first and, when external sources are required, to first issue debt, and to issue equity capital only as a last resort (Myers, 1984).

2.2.1 The Modigliani-Miller irrelevance theorem

Modern capital structure theory began to emerge only in 1958 with the seminal paper by Modigliani and Miller (1958). Until then, the capital structure theory consisted of only loose assertions about investors' behavior. Modigliani and Miller either explicitly or implicitly assumed that:

- Managers always maximize shareholders' wealth (i.e., there are no agency costs);
- Firms issue only two types of claims: risk-free debt and risky equity;
- All firms are assumed to be in the same risk class;
- All cash flows are perpetuities;
- There are no taxes;
- Operating cash flows are completely unaffected by changes in capital structure;
- There are no bankruptcy costs;
- Individuals can borrow and lend at a risk-free rate;
- Stocks and bonds are traded on a perfect capital market; and
- Corporate insiders and outsiders have the same information (i.e., there is no information asymmetry).

Modigliani and Miller (1958) thus argued that a firm's capital structure is irrelevant to the firm's value and its cost of capital.

The value of the levered firm (V_L) is equal to the value of the unlevered firm (V_U) and is obtained by capitalizing its expected net operating income (*EBIT*) at a constant rate (r_{sU}) that is based on the firm's risk class:

$$V_L = S_L + D = V_U = \frac{EBIT}{r_{sU}}.$$

The cost of equity of the levered firm (r_{sL}) is equal to the cost of equity of the unlevered firm (r_{sU}) plus a risk premium that results from the firm's financial risk depending on the difference between the unlevered cost of equity (r_{sU}) and the firm's cost of debt and the firm's debt-equity ratio (*D/S*):

$$r_{sL} = r_{sU} + risk\ \ premium = r_{sU} + \left(r_{sU} - r_d\right)\left(D/S\right).$$

Increasing the firm's leverage thus cannot increase the value of the firm despite the benefits of replacing the high-cost equity with low-cost debt. The benefits of the cheaper debt are exactly offset by an increase in the risk of equity and thus the firm's cost of capital. In order to support

their propositions, Modigliani and Miller (1958) used an arbitrage proof. They showed that, if the value of two firms differs only because of the differences in their leverage, investors would sell the high-value firm and buy the low-value firm, driving down the price of the high-value firm and driving up the price of low-value firm until the prices were equal.

2.2.2 Taxes and tax advantage to debt

The effects of corporate taxes on a firm's value and its cost of capital were already studied by Modigliani and Miller in their seminal paper (Modigliani and Miller, 1958). However, they published a corrected argumentation five years later (Modigliani and Miller, 1963). Taking into account corporate taxes, Modigliani and Miller (1963) argued that leverage increases the firm's value because interest is a tax-deductible expense and increases the income available to shareholders.

The value of the levered firm (V_L) is equal to the value of the unlevered firm in the same risk class (V_U) plus the gain from leverage associated with tax savings (TS), which are equal to the present value of the product of the corporate tax rate (τ) and the amount of the firm's debt (D), discounted at a risk-free rate of return:

$$V_L = V_U + TS = \frac{EBIT(1-\tau)}{r_{sU}} + \frac{\tau D}{r}.$$

Although one can conclude that the firm's value is maximized at 100 percent debt financing, Modigliani and Miller (1963) concluded that the result does not necessarily mean that a firm should always seek the maximum possible amount of debt. If personal taxes are taken into account, retained earnings might be cheaper. Moreover, they consider the firm's need to preserve flexibility and thus to maintain reserve borrowing capacity.

The cost of equity of the levered firm (r_{sL}) is equal to the cost of equity of the unlevered firm (r_{sU}) plus a risk premium that results from the firm's financial risk depending on the difference between the unlevered cost of equity (r_{sU}) and the firm's cost of debt, the corporate tax rate (τ), and the firm's debt-equity ratio (D/S):

$$r_{sL} = r_{sU} + risk\ \ premium = r_{sU} + (r_{sU} - r_d)(1-\tau)(D/S).$$

Because $(1 - \tau)$ is smaller than 1, the cost of equity of the levered firm (r_{sL}) increases less rapidly with leverage than in the world without taxes.

Later on, Hamada (1969) derived Modigliani and Miller's propositions using the mean-variance approach. The mean-variance approach makes it possible to consider risk in a more direct way than the risk-class assumption and the arbitrage proof used by Modigliani and Miller (1963). Moreover, Rubenstein (1973) showed that within the mean-variance framework Modigliani and Miller's propositions hold despite abandoning the assumption of risk-free debt.[4]

On the other hand, Miller (1977), extending the model to include personal taxes, argued that the gain from leverage (*TS*) falls to:

$$TS = \left[1 - \frac{(1-\tau_C)(1-\tau_{PS})}{(1-\tau_{PB})}\right] D,$$

in which τ_C is the corporate tax rate, τ_{PS} is the personal income tax rate applicable to income from common stock (dividends and capital gains), and τ_{PB} is the personal income tax rate applicable to income from bonds (interest).

The value of the levered firm (V_L), being equal to the value of the unlevered firm (V_U) plus the gain from leverage (*TS*):

$$V_L = V_U + TS = V_U + \left[1 - \frac{(1-\tau_C)(1-\tau_{PS})}{(1-\tau_{PB})}\right] D,$$

thus depends on the ratios of the corporate tax rate (τ_C) to the personal income tax rate from dividends and capital gains (τ_{PS}), and the personal income tax rate from interest (τ_{PB}). If the personal tax rate from dividends and capital gains (τ_{PS}) and personal income tax rate on interests (τ_{PB}) are equal, the gain from leverage falls to τD, which is equal to the gain from leverage obtained by Modigliani and Miller (1963) taking into account only corporate taxes. However, the personal tax rate from dividends and capital gains (τ_{PS}) is normally lower than the personal income tax rate on interests (τ_{PB}), resulting in gain from leverage being lower than τD.[5]

Miller (1977) argued that in the aggregate firms issue a level of aggregate debt such that the before-tax yields on corporate securities and the personal tax rates adjust to market equilibrium. At equilibrium, $(1 - \tau_{PB})$ would equal $(1 - \tau_C)(1 - \tau_{PS})$, and so the tax advantage to the firm would be exactly offset by the personal taxation, and thus the gain from leverage would completely vanish. Miller (1977) therefore concluded that leverage has no effect on a firm's value and its cost of capital.

[4] The same result was provided by Stiglitz (1969) using a state preference framework.
[5] Personal income tax rates applicable to income from common stock are close to zero because investors can defer realization of capital gains.

In contrast to Miller (1977), DeAngelo and Masulis (1980) considered tax shields other than interest payments, such as accounting depreciation, depletion allowances, and investment tax credits, and showed that there exists a market equilibrium in which each firm has a unique optimal capital structure. They predicted that a firm will select the level of debt that is negatively related to the level of the tax shield substitutes at which the expected value of the interest tax shields is maximized. It is expected that increasing the leverage increases the probability of winding up with zero or negative earnings, causing the interest tax shields to decline in expected value.

2.2.3 Bankruptcy cost and the trade-off theory

By modeling a firm's value under the assumption that the firm's value is affected by the firm's choice of capital structure through interest tax shields and bankruptcy costs, Leland (1994) concluded that there exists an optimal capital structure.[67] Optimal capital structure is defined by the trade-off between the value created by the interest tax shield and the value lost from bankruptcy costs, as well as the value of lost interest tax shields.

Assuming that the value of the unlevered firm (V) follows a diffusion process with constant volatility:

$$\frac{dV}{V} = \mu(V,t)dt + \sigma dW,$$

in which W is a standard Brownian motion, and acknowledging that any claim with the value $F(V,t)$ that pays a nonnegative coupon (C) when the firm is solvent satisfies the following partial differential equation:

$$\frac{1}{2}\sigma^2 V^2 F_{VV}(V,t) + rVF_V(V,t) - rF(V,t) + F_t(V,t) + C = 0,$$

[6] Leland (1994) maintained Modigliani and Miller's assumption that operating cash flows are completely unaffected by changes in capital structure, which is why bankruptcy costs refer to only direct costs associated with bankruptcy, but not indirect ones, such as business disruption costs, which tend to be substantially higher (see Altman (1984) and Opler and Titman (1994) for evidence of business disruption costs).

[7] The first quantitative examination of the firm's optimal capital structure was conducted by Brennan and Schwartz (1978). However, using numerical techniques to determine optimal leverage precluded a closed-form solution and thus cannot claim generality.

the following general solution if the security has no explicit time dependence can be obtained:

$$F(V) = A_0 + A_1 V + A_2 V^{-(2r/\sigma^2)}.$$ [89]

The equation can be applied to the valuation of various securities. Let us consider the firm's debt $D(V)$. Defining V_B as the level of the asset value at which bankruptcy is declared and α as the fraction of the value of the firm lost to bankruptcy costs, leaving debt holders with $(1 - \alpha)\ V_B$, and shareholders with nothing, the boundary conditions are:

$$\text{at } V = V_B \qquad D(V) = (1 - \alpha)\ V_B \text{ and}$$

$$\text{at } V \to \infty \qquad D(V) = C / r.$$

Observing that, as the value of assets approaches infinity at the second boundary condition, $V \to \infty$, the value of debt $D(V)$ is equal to the present value of perpetual coupon stream C / r. If $A_0 = C / r$, then $A_1 = 0$ and $lim\ V^{-(2r/\sigma 2)}$. Because $D(V) = (1 - \alpha)V_B$ at the first boundary condition, we can rewrite the above equation as:

$$D(V) = C/r + A_2 V^{-(2r/\sigma^2)} = (1-\alpha)V_B,$$

and solve for A_2:

$$A_2 = \left[(1-\alpha)V_B - C/r\right] V_B^{\,2r/\sigma^2}.$$

The value of debt $D(V)$ is equal to:

$$D(V) = C/r + \left[(1-\alpha)V_B - C/r\right](V/V_B)^{-2r/\sigma^2} = (1-p_B)C/r + p_B\left[(1-\alpha)\right]V,$$

in which:

$$p_B \equiv (V/V_B)^{-2r/\sigma^2}.$$

[8] The basis for valuation is Black and Scholes' model. In addition to the option-pricing framework, the time-state-preference model and mean-variance model were used to study optimal capital structure (see Kraus and Litzenberger [1973] and Kim [1978], respectively).

[9] Time independence, despite debt securities, generally has a specified maturity, is justified in two ways. First, if debt has sufficiently long maturity, the return of principal effectively has no value and can be ignored. Second, time independence can be justified by assuming that debt is rolled over when it matures.

The value of the firm's debt is equal to the present value of the risk-free debt weighted by a disruption factor that reflects the bankruptcy costs and the timing of bankruptcy, and the payout if bankruptcy occurs.

The value of the interest tax shield and the bankruptcy costs is determined in a similar fashion. The value of the interest tax shield $TS(V)$, which corresponds to the value of a security that pays a constant coupon equal to the tax-sheltering value of interest payment (τC) as long as the firm is solvent (at $V = V_B$, $\tau C = 0$), is equal to:

$$TS(V) = \tau(C/r) - [\tau(C/r)](V/V_B)^{-2r/\sigma^2} .$$

The value of bankruptcy costs $BC(V)$, which corresponds to the value of a security that has a value equal to bankruptcy costs, αV_B, when $V = V_B$ (but pays no coupon when the firm is solvent), is equal to:

$$BC(V) = \alpha V_B (V/V_B)^{-2r/\sigma^2} .$$

The value of the firm is equal to the value of the firm's assets, plus the value of the interest tax shield, less the value of bankruptcy costs. In the terminology used above, this can be rephrased as the value of the levered firm (V_L) being equal to the value of the unlevered firm (V_U), plus the present value of the gain from leverage associated with tax savings ($TS(V)$), less the present value of the bankruptcy costs ($BC(V)$):

$$\begin{aligned} V_L(V) &= V_U(V) + TS(V) - BC(V) \\ &= V_U(V) + \tau(C/r) - [\tau(C/r)](V/V_B)^{-2r/\sigma^2} - \alpha V_B (V/V_B)^{-2r/\sigma^2} , \end{aligned}$$

which, after some manipulation, can be rewritten as:

$$V_L(V) = V_U(V) + \tau D - p_B \tau D - \alpha V_B p_B .$$

The value of the firm is equal to the value of the unlevered firm plus the value of the interest tax shields, less the present value of the interest tax shields lost and the present value of bankruptcy costs that are incurred when the firm increases the leverage.

The static trade-off theory is correct only if there are no costs of adjustment. However, there are costs, and therefore lags, in adjustment to the optimum. In contrast to the static model developed

by Leland (1994), Fischer et al. (1989) modeled the capital structure choice in a dynamic framework.[10] They derived closed-form solutions for the value of the firm's debt and equity as a function of its recapitalization decisions. Dynamic optimal capital structure depends on the tax benefits of debt financing and bankruptcy costs, as well as the size of the recapitalization costs, and is defined by the range over which the firm allows its leverage to vary due to the recapitalization cost. Any ratio within the boundaries is optimal, and so similar firms can have different leverage ratios at any point in time.

2.2.4 Agency costs and optimal capital structure

As seen in the previous section, the introduction of bankruptcy costs allows us to define a firm's optimal capital structure. The problem with this approach is that it implies that no debt will be ever used in the absence of interest tax savings if bankruptcy costs are positive. However, the debt was in fact used even before the income tax existed, and the debt could have been used as a tax shield. By recognizing the existence of agency cost, Jensen and Mackling (1976) argued that in contrast to the previous contributions, operating cash flow is affected by changes in capital structure. This allowed them to explain the optimal capital structure puzzle.[11]

Jensen and Meckling (1976) identified two types of conflicts between the firm's stakeholders that result in various types of agency costs. First, as already discussed in the previous section, they acknowledged a conflict between shareholders and managers. The conflict between shareholders and managers arises because managers do not hold total residual claim, and thus they cannot capture the entire gain from their value-maximizing activities, although they bear the entire cost. As a result, managers usually do not pursue their activities in order to maximize shareholders' wealth, meaning that they consume perquisites, invest in unrelated businesses and build empires, and so on. This inefficiency can be mitigated by a larger ownership share held by the manager, which also increases with the share of the firm financed with debt. Jensen (1986) also argued that debt commits firms to pay out cash, and thus it reduces free cash flow problems (i.e., the amount available to managers to overinvest). Finally, if bankruptcy is costly for managers because of the potential reputation lost, debt can create an incentive to pursue only value-maximizing activities because such behavior reduces the probability of bankruptcy (Grossman and Hart, 1982).

A second type of conflict arises between debt holders and equity holders because debt contracts give equity holders an incentive to invest suboptimally. The debt contract results in asymmetric distribution of the gains, meaning that, if an investment is profitable above the face value of debt,

[10] The basis for their theoretical framework is the model developed by Kane et al. (1984, 1985).
[11] The contributions within the theory of agency costs are complementary to the trade-off theory discussed above and thus do not disagree with the effects of taxes and bankruptcy cost on optimal capital structure. See Leland (1998) for an example of the integration of the two approaches.

most of the gain is captured by equity holders, whereas if investment fails debt holders bear all the consequences because of the limited liability of the equity holders. As a result, Jensen and Meckling (1976) argued that equity holders may benefit from investing in very risky projects, even if they are evaluated as value-decreasing. Such investments result in a decrease of the value of debt, whereas the loss in the value of equity due to poor investment is more than offset by the gain in equity value because of asset substitution (i.e., value transferred from debt holders).

Jensen and Meckling (1976) illustrated the incentive effects associated with the existence of debt using a simple example. They assumed an unlevered firm operating in a world without taxes. The firm has to choose between two mutually exclusive projects that have the same expected return but differ in their distribution ($\sigma_1 < \sigma_2$). If the unlevered firm decides which project to invest in before the financing decision is made, it is indifferent in choosing between one or the other. However, if the firm first issues debt and then decides, it is not indifferent. By promising the debt holders that it will take a low-variance project (which is preferred by debt holders) and then issuing debt, the firm can transfer wealth from the debt holders to equity holders by choosing the high-variance project. The result is obtained by evaluating the change of the firm's equity and debt resulting from the increase of the risk using the option pricing model (Black and Scholes, 1973). The value of the firm's equity can be viewed as a call option on the total value of the firm with an exercise price equal to the face value of debt exercisable at the date of debt maturity. Merton (1973, 1974) showed that the value of the call option increases as the variance of the return increases. Therefore, if the firm switches from a low-variance to high-variance project, the value of the firm's equity increases and the value of the firm's debt decreases.[12]

Myers (1977) pointed out another agency cost of debt. Viewing part of the corporate assets, particularly growth opportunities, as call options whose value depends on discretionary future investments, he showed that by issuing risky debt a firm reduces its value by inducing a suboptimal investment strategy or by forcing the firm and its debt holders to bear the costs of avoiding the suboptimal strategy.

[12] The example assumes that debt holders cannot prevent the firm from switching to a high-variance project after the debt was issued and transferring wealth from debt holders to equity holders. Normally, debt holders foresee such behavior and raise the cost of debt accordingly to partly offset the transfer of wealth from themselves to equity holders.

The value of an all-equity financed firm with no assets in place and one future investment opportunity to invest I in the next period, which provides the firm with assets worth $V(s)$ if the firm invests or 0 if the firm does not invest because the real option expires and has no value, is equal to the following at $t = 0$:

$$V = \int_{s_a}^{\infty} q(s)x(s)[V(s) - I]ds \,.^{13}$$

If the firm issues debt D and uses the proceeds to buy back equity, the value of the firm's debt is equal to the following at $t = 0$:

$$V_D = \int_{s_a}^{\infty} q(s)[\min(V(s) - I), D]ds \,.$$

Myers (1977) argued that, if debt matures after the firm's investment option expires, the outstanding debt will change the firm's investment decision. If the firm raises amount I and exercises its investment option, the value of equity and debt is equal to the following at $t = 1$:

$$V_E = \min(0, V(s) - D) \text{ and}$$

$$V_D = \min(V(s), D).$$

However, from the equity holders' point of view, the investment option is worth exercising only if $V(s) > I + D$. Thus the firm's value at $t = 0$ is given by:

$$V = \int_{s_b}^{\infty} q(s)x(s)[V(s) - I]ds \,,$$

in which s_b depends on D, the value of promised payment to debt holders. Thus, as long as $s_b > s_a$ there is a loss in the firm's value due to its leverage. Moreover, the higher the leverage, the higher the loss. In fact, if D is large enough such that $V(s) < I + D$, $x(s)$ is zero, meaning the firm is worthless (and thus also the value of its debt) because its investment option will expire unexercised.[14]

[13] s is the state of nature. The investment will be made only if $V(s) \geq I$. s_b is thus the breakeven state.

[14] It follows that the firm value is maximized when the firm issues no debt. In the real world, the incentive problem is avoided by allowing creditors to exercise the investment option. In addition, one has to take into account the tax benefits of debt, as well as agency costs associated equity, as argued by Jensen and Meckling (1976).

Given the increasing agency cost associated with the high proportion of equity on the one hand, and the increasing agency cost associated with the high proportion of debt on the other, Jensen and Meckling (1976) argued that there exists an optimal capital structure that minimizes total agency costs.[15] By taking into account the agency costs, they showed that optimal capital structure also exists in a world without taxes and bankruptcy costs.

2.2.5 Asymmetric information and the pecking order hypothesis

The trade-off theory implicitly assumes that investors know the firm's expected returns because they have the same information as the firm's managers (insiders) and value the firm accordingly. However, it is clear that this is not the case. A firm's value is assessed only by the perceived stream of returns, which can differ substantially from the real ones. Capital structure choice can thus change the market perception and affect the firm's value.

Ross (1977) argued that an incentive-signaling equilibrium separates firms in which managers are confident of better prospects from those in which managers are not. He suggested that a firm signals its type using debt, and thus we can expect a firm with optimistic prospects and higher value to operate with higher leverage.

An incentive-signaling equilibrium is obtained by assuming that the manager-insider is compensated by a known incentive schedule:

$$M = (1+r)\gamma_0 V_0 + \gamma_1 \begin{cases} V_1 \text{ if } V_1 \geq D \\ V_1 - C \text{ if } V_1 < D \end{cases},$$

in which γ_0 and γ_1 are positive weights, r is one period interest rate, V_0 and V_1 are the current and future value of the firm, D is the face value of debt (D^* being the maximum amount the unsuccessful firm can carry), and C is a penalty paid if bankruptcy occurs.

It can be shown that if we have two firms, A and B, with the total return (value) a and b, respectively, so that $a > b$, in which the manager's compensations are given by:

$$M_a = \begin{cases} (\gamma_0 + \gamma_1)a \text{ if } D^* \leq D \leq a \\ \gamma_0 b + \gamma_1 a \text{ if } D < D^* \end{cases} \text{ and}$$

[15] Titman (1984) argued that the same agency problems characterize the relations between the firm, or its equity holders, and other stakeholders, such as customers and workers. As in the contributions presented above, appropriate capital structure should ensure that incentives are aligned so that the firm's value is maximized.

$$M_b = \begin{cases} \gamma_0 a + \gamma_1 (b - C) \text{ if } D^* \le D \le V_{1b} \\ \gamma_0 b + \gamma_1 b \text{ if } D < D^* \end{cases},$$

in the signaling equilibrium, in the sense defined by Spence (1974), managers signal the firm's type by choosing debt levels:

$$D^* < D_a \le a \text{ and}$$

$$D_b \le b .$$

In equilibrium, neither of managers has an incentive to change the signal (the amount of debt used) because:

$$M_a(F_a) = (\gamma_0 + \gamma_1)a > \gamma_0 b + \gamma_1 a \text{ and}$$

$$M_b(F_b) = (\gamma_0 + \gamma_1)b > \gamma_0 a + \gamma_1 (b - C).$$

Therefore, the manager will always signal truthfully about the type of firm.

Leland and Pyle (1977) developed a model of capital structure in which entrepreneurs seek financing for their projects whose true qualities are known only to them. They showed that an entrepreneur's willingness to invest his own funds in the project can, similar to debt, serve as a signal of the project quality. The value of a firm thus increases with the share of the firm held by the entrepreneur, meaning the firm has greater debt capacity and operates with larger amounts of debt.

Myers and Majluf (1984) showed that, if a firm finances a new project by issuing equity, underpricing may be so severe that new investors will capture more than the NPV of the new project. This results in a net loss to the existing shareholders, who thus reject the project in spite of the positive NPV. The underinvestment problem is mitigated by financing the project with internal sources or issuing debt, which is less underpriced by the market. Therefore, it is expected that a firm's financing process follows a specific order, forcing the firm to exhaust internal sources first and, when external sources are required, to first issue debt, and to issue equity capital only as a last resort (Myers, 1984).

The implications of underpricing can be shown using a simple three-period model. Assume that at $t = -1$ investors have the same information as managers, and at $t = 0$ managers receive some additional information about the value of the firm's assets in place (a) and its investment opportunity (b) and update its value accordingly, whereas the market receives this information

only at $t = 1$. Assume also that the manager acts in the interest of the existing shareholders and that old shareholders are passive.

If the firm's financial slack (S) (i.e., cash holdings or marketable securities) or ability to issue risk-free debt is lower than the investment required (I), so that $0 \leq S < I$, and the project is financed by equity issue, $E = I - S$, the value of the shareholders' shares ($V^{existing}$) is equal to:

$$V^{existing} = \frac{P'}{P'+E}(E + S + a + b),$$

in which P' is the existing shares market value.

However, the existing shareholders are better off if the firm issues only when:

$$S + a \leq \frac{P'}{P'+E}(E + S + a + b),$$

or when:

$$\frac{E}{P'+E}(S + a) \leq \frac{P'}{P'+E}(E + b),$$

which can be rewritten as:

$$(E/P')(S + a) \leq E + b\,.$$

The equation $(E/P')(S + a) = E + b$ thus divides the joint probability distribution of $\overline{A}$ and $\overline{B}$, which are the expected values of assets in place, and project NPV, into two regions (M' and M). If the actual outcome falls in region M', the firm issues and invests, whereas it does nothing if it falls in region M. If the outcome falls in region M, the firm is willing to give up the NPV of the investment rather than issue underpriced equity.

The price of the shares P' depends on the probability densities of $\overline{A}$ and $\overline{B}$ in the regions M' and M, and the boundaries depend on P', meaning that P' and M' and M are simultaneously determined. The equity issue will be fairly priced if:

$$P' = S + \overline{A}(M') + \overline{B}(M'),$$

in which $\overline{A}(M') = E(\overline{A}|E = I - S)$ and $\overline{B}(M') = E(\overline{B}|E = I - S)$, thus reflecting only the information available to investors.

The equilibrium thus implies that the firm may pass up good positive investment opportunities rather than issuing equity to raise funds. The decision to issue equity always reduces the share price because, if the price is conditional on not issuing and is equal to the expected value of the assets in place and slack ($P = \overline{A}(M') + S$), then in all realizations of $a\ \overline{A}(M)$ exceed $P' - S$.

However, the problem is exacerbated if the firm issues debt instead of equity. The firm issues debt if $b > \Delta D = D_1 - D$. If the firm can issue risk-free debt and $\Delta D = 0$, the firm will issue it whenever $b > 0$. Thus the ability to issue risk-free debt is as good as financial slack. If the firm issues risky debt, ΔD can be positive or negative, but with option-pricing in mind ΔD in absolute value will be always less than ΔE. Let us compare the debt and equity financing decision. The firm will always invest when ΔD and ΔE are zero or positive. Suppose that ΔD and ΔE are positive. If the firm is willing to issue equity, it is also willing to issue debt because $\Delta D < \Delta E$. However, debt is issued in some states when equity is not, and thus the ex ante value of the firm is higher under the debt-financing policy because of the lower loss of value due to underinvestment.

According to the pecking order hypothesis, debt is always preferred to equity because there does not exist an equilibrium price P' at which the firm can issue equity. Equity would be preferred to debt only if P' was high enough that $\Delta D > \Delta E$. However, this occurs only if $\Delta E < 0$, implying a capital loss to the existing shareholders.

2.3 Empirical evidence of capital structure choice

There is a large body of empirical research on capital structure choice available, and it is almost impossible to survey it completely. Following the review of theoretical contributions, one would first be interested in the ability of modern capital structure theory to explain capital structure decisions in practice. Then, empirical evidence is largely based on US firms, making one doubtful of its robustness and suspicious of regularities resulting from merely spurious correlations. Moreover, there are significant differences in corporate governance systems, as well as financial systems, around the world, which significantly affects the demand and supply of finance. The next question is whether the same forces drive capital structure decisions in different environments.

Therefore, I start my survey of empirical evidence of capital structure choice with a strand of research aimed at testing various capital structure theories. A first glance at the field reveals a

contest between trade-off theory, which considers tax benefits and bankruptcy costs, as well as agency cost aspects, and the pecking order hypothesis. The surveyed literature provides clear evidence of substantial tax effects (Mackie-Mason, 1991; Graham, 1996; Masulis, 1980; Kemsley and Nissim, 2002), bankruptcy costs (Warner, 1977; Altman, 1984; Opler and Titman, 1994; Bradley et al., 1984), and agency cost considerations (Long and Malitz, 1985), as well as mean reversion in debt ratios (Taggert, 1977; Marsh, 1982; Auerbach, 1985; Julilvand and Harris, 1984; Opler and Titman, 1994; Hovakimian et al., 2001; Flannery and Rangan, 2006), confirming the trade-off theory. On the other hand, there several important contributions in favor of the pecking order hypothesis (Shyam-Sunder and Myers, 1999; Bharath et al., 2008), as well as against the pecking order hypothesis (Helwege and Liang, 1996; Frank and Goyal, 2003). Strebulaev (2007) argued that most of the controversy results from ill-specified tests, ignoring dynamics in capital structure choice. Having this in mind, he provided clearer evidence in favor of the trade-off theory. Welch (2004) found that firms do not issue and repurchase debt and equity to counteract the mechanistic effects of stock returns on their debt-equity ratios and argued that stock returns are the primary determinant of capital structure and capital structure change. Last but not least, empirical evidence shows that firms' leverage is well beyond the levels suggested by modern capital structure theory and that little of the variation in leverage is captured by the proposed determinates. As found by Lemmon and Zender (2001), firms pursue very conservative financial policies and their debt ratios exhibit significant stability over time. Lemmon et al. (2006) found that little of the variation in leverage is captured by previously identified determinates and that the majority of variation in debt ratios is driven by unobserved time-invariant effect. Thus something must be wrong with modern capital structure theory.

Next, I review cross-country tests to compare the determinants of capital structure choice in different environments. Rajan and Zingales (1995) found that leverage is generally similarly correlated with the factors identified as important determinants of capital structure choice in US firms in all G-7 countries. Weaker evidence was provided by Booth et al. (1999) and Delcoure (2007), who investigated capital structure choice in developing and emerging central and eastern European countries. However, in contrast, recent empirical studies have started to acknowledge significant differences in forces driving capital structure choice in different environments (La Porta et al., 1997; Demirguc-Kunt and Maksimovic, 1999; Giannetti, 2003; De Jong et al. 2007), especially those stemming from institutional factors and economic and financial market development.

2.3.1 The trade-off theory versus the pecking order hypothesis

Despite initial evidence provided by Modigliani and Miller (1958) suggesting that that the cost of capital is not affected by capital structure and that there is no gain to leverage, Weston (1963), as well as Miller and Modigliani (1966) later on, found evidence of the existence of the gain to

leverage due to the tax shield provided by debt. Combining Modigliani and Miller's propositions and the CAPM model, Hamada (1972) found that on average the systematic risk of the levered firm is greater than that of the unlevered firm, and confirmed the prediction that increased risk is associated with higher leverage.

Consistent with the trade-off theory, Bradley et al. (1984) found that leverage is negatively related to bankruptcy risk approximated by earning volatility and agency costs of debt, approximated by the extent of managerial discretion associated with investments in R&D and advertising expenditures. However, inconsistent with the theoretical prediction, they found a negative impact of other nondebt tax shields on leverage. Long and Malitz (1985) pointed out the agency cost of debt (i.e., moral hazard that affects investment decisions) as a major determinant of a firm's leverage. They found that firms that invest in intangible assets such as R&D and advertising, and are thus subject to problems of underinvestment and asset substitution, choose lower leverage ratios. Meanwhile, firms investing in tangible assets, in which these problems do not emerge, operate with higher leverage. They showed that the more discretionary investment opportunity a firm faces, the lower the leverage. In contrast, Titman and Wessels (1988) employed linear structural modeling and supported the pecking order hypothesis by showing that only asset uniqueness and profitability (negatively) affect leverage, while finding no support for effects on leverage arising from nondebt tax shields, volatility, collateral, and future growth opportunities.

Mackie-Mason (1991) examined incremental financial decisions rather than leverage ratios and found clear evidence of substantial tax effects. He found that firms with high tax loss carryforwards are unlikely to be able to use interest deductions and are thus less likely to use debt, whereas firms with investment tax credits are often profitable and paying taxes and thus, as expected, do not reduce the probability of issuing debt. However, when firms are nearly tax-exhausted, investment tax credits reduce the probability of issuing debt. Graham (1996) provided evidence of tax effects by explicitly calculating company-specific marginal income tax and using these rates to examine incremental financing decisions. Masulis (1980) found evidence of tax, as well as wealth redistribution effects, by studying the impact of capital structure change announcements on security prices. Graham (2000) and Kemsley and Nissim (2002) estimated the tax benefit of debt and concluded that these benefits amount to 9.7 percent of firm value (4.3 percent net of personal taxes) and 10 percent of firm value, respectively. Kahle and Shastri (2005) pointed out another nondebt tax shield: tax benefits of employee stock options. They found that both long-term and short-term debt are negatively related to the size of tax benefits from the option exercise, that one-year changes in long-term debt are negatively related to changes in the number of options exercised, and that firms with option-related tax benefits tend to issue equity, with the net amount being an increasing function of these benefits.

As for the tax benefits of debt, there is broad evidence of the existence of bankruptcy costs. Warner (1977), measuring only direct costs such as lawyers', accountants', and other professional fees, and managerial time spent in administrating bankruptcy (i.e., bankruptcy costs), found that direct costs are trivial, averaging 1 percent of the market value of the firm seven years prior to bankruptcy, and rising to 5.3 percent of the firm value immediately prior to bankruptcy. Moreover, direct costs as a percentage of firm value decrease with the size of the firm. An estimate of business disruption costs is provided by Altman (1984). Comparing estimated profits computed from a time-series regression with actual profits, he found that these on average amount to 8.1 percent of firm value three years prior to bankruptcy and 10.5 percent of firm value in the year of bankruptcy. Opler and Titman (1994) estimated the market impact of business disruption costs by comparing the decline of high-leverage firms with low-leverage firms in the same industry during downturns. They found that the market value of the equity of high-leverage firms decline on average 26 percent more than for low-leverage firms.

There also exists strong evidence for mean reversion in debt ratios, or that firms adjust debt ratios toward target capital structure (Taggart, 1977; Marsh, 1982; Auerbach, 1985; Jalilvand and Harris, 1984; Opler and Titman, 1994; Hovakimian et al., 2001; Flannery and Rangan, 2006). Hovakimian et al. (2001), for example, found that although pecking order considerations tend to affect leverage in the short run, in line with the trade-off theory firms make financing choices that move them to target debt ratios. Their findings, on the one hand, confirm that more profitable firms operate on average with lower leverage but, on the other, that more profitable firms are more likely to issue debt rather than equity and are more likely to repurchase equity rather than retire debt. This is consistent with the hypothesis that most profitable firms become under-levered and that firms' financing choices tend to offset earnings-driven changes in their capital structures. In addition, they found that firms with higher current stock prices are more likely to issue equity rather than debt. This is, on the one hand, consistent with the trade-off theory by assuming that firms experience higher stock prices when they realize better growth opportunities but, on the other hand, also with models based on agency cost and asymmetric information, being aware that managers are reluctant to issue equity when stock prices are low or when they have an incentive to increase leverage when stock prices are low. Flannery and Rangan (2006) provided evidence that the typical firm converges toward its long-term target at a rate of closing more than 30 percent of the gap between actual and target debt ratio per year. More than half of the variation observed in debt ratios can be attributed to targeting behavior, whereas market timing and pecking order factors explain less than 10 percent of the variation. In addition, Flannery and Rangan (2006) found that stock price changes have only transitory effects on capital structure.

Strebulaev (2007) investigated whether the interpretation of cross-sectional tests would change if firms optimally adjusted their leverage only infrequently. In a dynamic economy with frictions, the actual leverage of most firms deviates from the optimal one. Consequently, even if firms

follow a certain model of capital structure, a static model may fail to explain differences between firms in the cross-section because actual and optimal capital structure differ. By constructing a model of optimal dynamic capital structure in the presence of frictions to generate dynamic paths of leverage and replicating most common tests, he found that the properties of leverage in the cross-section in true dynamics and comparative statics at refinancing points differ dramatically, and that the model gives rise to data that are consistent with a number of empirical results and that using the methodology employed in the literature may lead to the rejection of the model. For example, his model predicts a positive relation of profitability and leverage; however, he showed that in a dynamic context cross-sectional tests reveal a negative relation. He argued that, with infrequent adjustments, an increase in profitability lowers leverage by increasing future profitability and thus the value of the firm. Similarly, a decrease in profitability increases leverage. For firms that do not refinance, these normally dominate; this results in a negative relation between leverage and profitability.

In contrast, Welch (2004) found that firms do not issue and repurchase debt and equity to counteract the mechanistic effects of stock returns on their debt-equity ratios and argued that stock returns are the primary determinant of capital structure and capital structure change. By disentangling the firm's capital structure change into two components, one related to issuing activity and the other to stock returns, he found that stock returns causing equity growth explain 40 percent of capital structure dynamics. Despite finding that issuing activity explains the other 60 percent, he argued that issuing activities are not used to counterbalance stock return-induced equity value changes. In addition, he showed that the variables traditionally used in capital structure research fail to explain capital structure changes once stock returns are accounted for.

Shyam-Sunder and Myers (1999) examined the relative explanatory power of the pecking order theory and trade-off theory rather than attempting to test various models by including all hypotheses jointly in one empirical test. They found that the pecking order model explains much more of the time-series variance in actual debt ratios than a target adjustment model based on the static trade-off theory. By disentangling the financial deficit into expected and unexpected, they provided evidence that the pecking order model is not driven merely by short-term adjustments to an unanticipated financing deficit and impediments to equity issue on short notice. Moreover, they showed that by testing the models on data simulated by the pecking order and target adjustment model, they showed that the pecking order model can be rejected when the financing process follows the target-adjustment specification, whereas the target-adjustment model cannot be rejected when the financing process follows the pecking order specification.[16]

Helwege and Liang (1996) examined IPO firms because these firms can be good candidates for pecking order behavior due to high growth at a time when generated cash flow is minimal, there

[16] Chirinko and Singha (2000) pointed out that it is difficult to differentiate between alternative theories because the Shyam-Sunder and Myers test cannot evaluate the pecking order or the static trade-off model.

is an inability to issue low-risk debt, and short track records increase information asymmetry. However, in contrast to Shyam-Sunder and Myers (1999), they found little support for the pecking order hypothesis. They found that firms do not access external funds because of a shortfall in internal funds, while the firms that raise funds externally do not follow the pecking order when choosing the type of security offered. They showed that the size of the financial deficit has no predictive power for the decision to obtain external sources and that the estimated coefficient on default risk and asymmetric information variables is mostly inconsistent with pecking order behavior. Evidence contrary to the pecking order hypothesis was also obtained by Frank and Goyal (2003). They found that net equity issues track the financing deficit more closely than net debt issues and that, even though large firms exhibit some aspects of pecking order behavior, the evidence is not robust to the inclusion of factors proposed by the trade-off theory. Meanwhile, Fama and French (2002) tested trade-off and pecking order predictions about dividend and capital structure policy and found inconclusive results. Finding that more profitable firms and firms with more investments operate with lower leverage and that variation in earnings and investments are largely absorbed by debt, on the one hand, they confirmed the pecking order hypothesis and rejected the trade-off theory. On the other hand, consistent with the trade-off theory, the evidence suggests that leverage is mean-reverting and firms thus adjust to optimal capital structure and, inconsistent with the pecking order, small low-leverage growth firms have large equity issues.

Evidence confirming that asymmetric information drives capital structure decisions was provided by Bharath et al. (2009). They used a novel information asymmetry index based on measures of adverse selection developed by the market microstructure literature and relied exclusively on measures of the market assessment of adverse selection rather than ex ante on a firm's characteristics. They argued that asymmetric information considerations are important, but not the sole determinants of the cross-sectional differences in levels and changes in leverage.

Lemmon and Zender (2001) examined capital structure choice by sorting firms into two groups and focusing on the forgone tax benefits of debt: firms that use debt conservatively and firms that use debt more aggressively. They found that a large share of firms are very conservative in their capital structure choice and forgo the substantial tax benefits of debt, and that modern capital structure theory does not appear to explain the leverage ratios of these firms. For the trade-off theory, they found little evidence that the forgone tax benefits of debt are offset by high costs of debt financing, and that conservatively financed firms are larger, more profitable, and have more stable cash flows compared to firms that are financed more aggressively. They also did not provide evidence in favor of pecking order behavior because they found that these firms maintain large financial slack even when they are seeking external financing and do not favor debt when they are raising external funds. However, they found mixed evidence regarding theories of managerial entrenchment. The most conservatively financed firms are less likely to become acquisition targets, but levels of inside ownership and rates of CEO turnover are similar to those

in firms being financed more aggressively. In addition, leverage increases following unsuccessful takeover attempts and forced CEO departures are larger in conservatively financed firms. In contrast, Minton and Wruck (2001) examined the phenomenon of financial conservatism by studying firms that adopt a persistent policy of low leverage and found that conservative firms follow a pecking order–style financial policy. They also showed that financial conservatism is only transitory and it is not industry related, and found that conservative firms stockpile financial slack or debt capacity and do not have low tax rates or high nondebt tax shields, or face severe asymmetric information.

Let us conclude this review with the striking findings obtained by Lemmon et al. (2006). They found that little of the variation in leverage is captured by previously identified determinates. Instead, they found that the majority of variation in debt ratios is driven by an unobserved time-invariant effect that results in stable capital structures over time despite exhibiting a significant amount of convergence. They showed that the adjusted *R*-square from a regression of leverage on firm fixed effects is 60 percent, and ranges up to 29 percent in studies using traditional capital structure factors. The stability of capital structure over time suggests that factors driving cross-sectional variation in leverage must also be stable over time. Their findings also suggest that the identification problem is more difficult than previously thought. Acknowledging the presence of permanent or transitory unobserved heterogeneity in capital structure decisions requires new identification strategies, such as fixed effect estimates or dynamic specifications.

2.3.2 Cross-country tests

The other strand of empirical capital structure research focuses on cross-country investigations. In the seminal paper, Rajan and Zingales (1995) argued that, in spite of the fact that we understand the capital structure implications of the most important departures from Modigliani and Miller's assumptions, very little is known about the empirical relevance of different theories. Empirical evidence is largely based on US firms, making one doubtful of its robustness and suspicious of regularities resulting from merely spurious correlations. Moreover, there are significant differences in corporate governance systems, as well financial systems, around the world, which significantly affects the demand and supply of finance. This raises another question. Do we observe the same forces driving capital structure choice in different environments?

Rajan and Zingales (1995) started filling this gap by investigating whether capital structure decisions in other countries are driven by the same factors as found for US firms. They studied firms' leverage, institutional differences, and capital structure determinants in G-7 countries (the United States, Japan, Germany, France, Italy, the United Kingdom, and Canada). They found that the leverage of the firms across all G-7 countries is fairly similar, except in the United Kingdom

and Germany, where firms are being relatively less levered. This finding contrasts with prior literature (see, e.g., Rutherford, 1988; Borio, 1990); however it results from using different measures for leverage and correcting for major differences in accounting. In most countries (except in Germany), the tangibility of assets and firm size is positively correlated with leverage, whereas market-to-book and profitability mostly exhibit negative correlation. They argued that, despite the fact that on the one hand the G-7 countries are fairly homogeneous in their level of economic development but, on the other hand, differ in their institutions, exemplified by tax and bankruptcy codes, the market for corporate control, and the historical role played by banks and securities markets, leverage is generally similarly correlated with the factors identified as important determinants of capital structure choice in US firms.

Booth et al. (2001) investigated capital structure choice in 10 developing countries that have different institutional structures relative to developed countries (i.e., India, Pakistan, Thailand, Malaysia, Turkey, Zimbabwe, Mexico Brazil, Jordan, and Korea). They tested the dependence of leverage on firm-level capital structure determinants, as well as a set of country-level macroeconomic variables. They concluded that factors that explain capital structure differences in developed countries are also relevant in developing countries; however, there are systematic differences in the way the leverage is affected by country-level factors. However, they expressed some skepticism because the overall impact of these factors is rather low and their signs sometimes vary across countries. These signs imply significant institutional differences that affect the impact of the capital structure determinants. Finally, they found that knowing the country is usually at least as important in explaining capital structure choice as knowing firm-level capital structure determinants.

Delcoure (2007) investigated whether capital structure determinants in emerging central and eastern European (CEE) countries support modern capital structure theory and argued that capital structure theories are portable to firms in CEE countries. However, she found that the trade-off theory, pecking-order theory, and agency costs theory do not explain capital structure choice in these countries. She found that firms in CEE countries follow the modified pecking order proposed by Chen (2004), who investigated Chinese firms. Managers in these countries seem to prefer equity to debt financing because share capital appears to be a free source of capital and not obligatory. Moreover, she argued that capital structure decisions are significantly affected by country-level institutional differences.

La Porta et al. (1996) argued that differences in financial system development and functioning result from differences in investor protection. La Porta et al. (1997) showed that countries with poorer investor protection, measured by the character of legal rules, as well as the quality of low enforcement, have smaller and narrower equity and debt markets. These rules and the resulting financial market development differ systematically by legal origin; that is English, French, German, or Scandinavian. They assumed that English common law protects investors the most,

French civil law the least, and German and Scandinavian civil law somewhere in between. That is why most of the subsequent cross-country tests took these country-level institutional aspects into account in addition to firm-level capital structure determinants.

Demirguc-Kunt and Maksimovic (1999) examined the relation between debt maturities and institutional differences in 30 countries. They found systematic differences in the use of long-term debt between developed and developing countries, as well as small and large firms (i.e., firms in developed countries have more long-term debt and a greater proportion of long-term debt in total debt, and large firms have a greater proportion of long-term debt in total debt). They also found that large firms in countries with effective legal systems have more long-term debt relative to assets and their debt is of longer maturity; however, they found limited evidence that firms in countries with a common-law tradition use less long-term debt than firms in coutries with a civil-law tradition. They did not find evidence that the size of the stock market affects firms' financing patterns, and that only the level of activity of the stock market can explain financing decisions. In particular, in countries with active stock markets firms have more long-term debt and longer maturities. In contrast, in countries with a large banking sector they observe that small firms have less short-term debt and their debt is of longer maturities.

Because the large listed firms used in existing research have easier access to financial markets and thus their financing decisions are less severally affected by institutional constraints, Giannetti (2003) also investigated how leverage and debt maturity are determined in unlisted firms in several European countries. In addition to finding significant differences in how leverage and debt maturity are determined, she found that these differences result from institutional factors (i.e., quality of creditor rights protection, law enforcement, and financial market development). She found that in countries with above average creditor protection it is easier to obtain loans for firms investing in intangible assets, which cannot be pledged as collateral, and that long-term debt is more easily accessed by firms with volatile returns. Moreover, creditor rights protection improves financing opportunities primarily for unlisted firms. Finally, she found that firms tend to be more levered in countries where the stock market is less developed.

In contrast to the findings of existing research, De Jong et al. (2007) investigated capital structure choice in 42 countries around the world and found that the firm-specific determinants of leverage differ across countries. In addition to the well-known direct impacts of institutional factors on capital structure decisions, they highlighted indirect effects. They argued that, on the one hand, institutional factors influence leverage directly and, on the other hand, indirectly through the impact on the effects of firm-specific capital structure determinants. Their findings imply that in countries with a more developed legal environment and more stable and healthier economic conditions, firms are more levered, and that the effects of firm-level capital structure determinants are reinforced.

* *

Capital structure theory is deeply rooted in the theory of the firm. The underlying theory of the firm defines the firm, and identifies the stakeholder in control and the goal of the firm. The earliest literature, referred to as the neoclassical theory, defines the firm as a black box, represented by a production function that specifies the output level that can be obtained given the level of inputs. The agency cost theory, recognizing incentive problems within the firm, views the firm as a legal fiction that serves as a focus for a complex process in which the conflicting objectives of individuals are brought into equilibrium within a framework of contractual relations (Jensen and Meckling, 1976). The property rights theory, recognizing incomplete contracting, identifies the firm with assets under common ownership, in which property rights imply control over the assets (Grossman and Hart, 1986). The earliest neoclassical literature assumes that the firm is run in the shareholders' interests by a selfless manager that chooses the input and output levels to maximize profits. It is no surprise, then, that it is assumed that the goal of the firm is to maximize the value of the firm and thus shareholders' wealth. The agency costs theory recognizes that stakeholders' interests within the firm are not aligned. Shareholders want managers to maximize the value of the firm and thus their wealth when running the firm. Although managers seek to maximize their own utility and their decisions often reflect their personal interests rather than those of the shareholders, it is assumed that shareholders align their interests by using managerial incentives, as well as other corporate governance mechanisms, to satisfy the conditions of efficiency. Property rights justify the allocation of control rights, which stem from ownership or property rights because of the ability to influence relationship-specific investments (Grossman and Hart, 1986; Hart and Moore, 1990; Hart, 1995) and influence financing (Aghion and Bolton, 1992; Hart and More, 1998; Tirole, 2001).

Modern capital structure theory, developed on the assumption that the firm is governed by shareholders and seeks to maximize the value of the firm and thus shareholders' wealth, consists of two competing theories. One is the trade-off theory and the other is the pecking order hypothesis. According to the trade-off theory, a firm finds its optimal capital structure by trading off the benefits of debt (i.e., tax benefits and the ability of debt to reduce agency costs of debt) with the costs of debt (i.e., bankruptcy costs and agency costs of debt). The pecking order model, on the other hand, hypothesizes that because of asymmetric information a firm's financing process follows a specific order and that firms first exhaust internal sources and, when external sources are required, first issue debt, and issue equity capital only as a last resort. According to the pecking order hypothesis, there is no optimal capital structure.

However, empirical evidence suggests that modern capital structure cannot sufficiently explain firms' capital structure decisions. Empirical evidence shows that firms' leverage is well beyond the levels suggested by modern capital structure theory and that little of the variation in leverage is captured by the proposed determinates. As found by Lemmon and Zender (2001), firms pursue

very conservative financial policies and their debt ratios exhibit significant stability over time. Lemmon et al. (2006) found that little of the variation in leverage is captured by previously identified determinates and that the majority of variation in debt ratios is driven by unobserved time-invariant effect. Thus something must be wrong with modern capital structure theory.

I argue that firms' leverage is well beyond the levels suggested by modern capital structure theory and that little of the variation in leverage is captured by the proposed determinates because firms generally are not governed by shareholders and modern capital structure theory has been developed on the false assumption about the goal of the firm. It is becoming widely believed that the firm's behavior is significantly affected by other stakeholders, such as managers and employees, as well. The firm's objective function thus often deviates from the concept of value maximization. Therefore, to develop a theory that will be able to explain capital structure choice, one first has to consider corporate governance issues, and first ask what the firm is, who governs the firm, what the objective functions of the stakeholders in control are, and what the goal of the firm is. Recognizing the inability of modern capital structure theory and hypothesizing about what led it into a fallacy, in the following chapter I first analytically develop a new corporate governance paradigm. Surveying the literature, I review corporate governance systems around the world to show that stakeholders other than shareholders significantly affect the behavior of the firm, while using the findings of the new theory of the firm (Rajan and Zingales, 1998; Aghion and Tirole, 1997) to provide theoretical foundations for the new definition of the firm. Using the option pricing theory developed by Black and Scholes (1973) and Merton (1973, 1974), I derive the claims of various stakeholders and define their objective functions and hypothesize about the goal of the stakeholder-oriented firm. Based on the objective functions of employee-governed and manager-governed firms, I then investigate the capital structure implications of having employees and managers in control and provide evidence of the capital structure implications of having employees in control by conducting an empirical study.

3 Stakeholder-oriented firm

Although the conventional theory of the firm assumes that a firm is governed by shareholders and that there is no room for other stakeholders' interests in the firm's objective function, it is becoming widely believed that a firm's behavior is also significantly affected by other stakeholders. Because a firm's objective function greatly depends on the country considered, I first survey corporate governance systems around the world. I provide evidence that in quite a substantial part of the world firms are also governed by employees and managers.

Acknowledging that a firm is governed by stakeholders other than shareholders (or, at least, not exclusively by shareholders), I reexamine the theory of the firm. In search of the theory of the firm, in which there is room for the interests of stakeholders other than shareholders, I review the literature labeled as the new theory of the firm. By identifying alternative sources of power within the firm, such as control over a critical resource, the new theory of the firm defines the firm not only in terms of assets, but also in terms of people. Moreover, it brings stakeholders other than shareholders within the boundaries of the firm. In contrast to the property rights theory, the new theory of the firm considers managers as well as employees as an important part of the firm. Thus, I adopt a new corporate governance paradigm that expands its focus beyond shareholders and their interests.

Having identified the sources of power and the controlling stakeholders, I analyze their claims in the firm and hypothesize about their objective functions. I argue that employees' and managers' objectives deviate from shareholder value maximization and, in addition to being aimed at maximizing their benefits instead of shareholder value, are characterized by greater risk aversion compared to those of the shareholders.

Finally, taking into account the stakeholders in control and their objective functions, I hypothesize about the goal of the stakeholder-oriented firm. Depending on the weight of each stakeholder's interest in the firm's objective function, a stakeholder-oriented firm can take a wide range of forms, from ones that are more shareholder-oriented to ones that put employees' or managers' interests in first place. Each of these has of course a distinctive objective function. I hypothesize about the goal of employee-governed firm, manager-governed firm and a firm governed by a coalition of stakeholders. If the firm is employee-governed, I argue that the firm is aimed at maximizing wages and minimizing the probability of bankruptcy. Because of employees' limited horizon, in comparison to those of the shareholders employees' objectives are more short-term oriented and, moreover, their objectives are characterized by higher risk aversion. Managers seek to maximize utility stemming from wages and pecuniary and non-pecuniary benefits, and only then the value of the firm that affects their compensation. However, in practice they end up maximizing revenues or growth of the firm. Because they have their

reputation at stake when running firms, their objectives favor firm survival. This corresponds to maximizing the revenues and the growth of the firm. A firm governed by a coalition of stakeholders should behave somewhere in between the goals of shareholders, employees and managers.

3.1 Corporate governance systems around the world

In a classic survey of corporate governance, Shleifer and Vishny (1997) outlined the modern corporate governance paradigm as follows: "Our perspective on corporate governance is as a straightforward agency perspective, sometimes referred to as separation of ownership and control. We want to know how investors get the managers to give them back their money." Maybe this is what corporate governance is about in the US, the UK, and some other Anglo-Saxon countries, where the law is clear that shareholders are the owners of the firms and managers have a fiduciary duty to act in the interests of the shareholders, and there are other powerful institutions in place, such as managerial incentive schemes, takeovers, and proxy fights, that align the interests of managers with those of the shareholders. However, moving beyond US and UK firms, the firm's objective function very much depends on the country being considered and, moreover, it deviates from the concept of shareholder value. In Germany, for example, the legal system is quite explicit that firms do not have the sole duty of pursuing the shareholders' interests. A system of codetermination enables employees' active participation in the firm's decision-making process; at the shop-floor level through workers' councils, and at the corporate level through employee and union representation on supervisory boards. Germany is by no means the only country where stakeholders other than shareholders significantly affect the behavior of the firm. I provide evidence of distinctive corporate governance arrangements in Japan, as well as other European countries, such as France, Italy, Sweden, and European transition countries.

Roe (2003) argued that before a nation can produce it must achieve social peace. Firms that face internal turmoil or external upheaval have production processes frequently interrupted and are valued less than firms in which production runs smoothly. Because of potential conflicts, investors invest reluctantly and require high rates of return. Therefore, preventing turmoil is a strong force in shaping corporate governance. Social peace has been reached in different countries by different means, some of which have affected corporate ownership patterns and corporate governance structures. It is no surprise then that corporate governance systems in many countries differ from those that prevail in the US, where these considerations were always of secondary importance. However, some divergences from the shareholder value model can also be observed in the US, which tends to most closely resemble shareholder society. Distant shareholders have always been inferior to strong managers, who tend to control US firms.

Taking into account the distinctive corporate governance arrangements around the world, it is clear that the corporate governance paradigm outlined by Shleifer and Vishny (1997) ignores some important components and is thus incomplete. The new corporate governance paradigm thus expands its focus to include other stakeholders and their interests. The OECD definition, for example, defines corporate governance as follows: "Procedures and processes according to which an organization is directed and controlled. The corporate governance specifies the distribution of rights and responsibilities among the different participants in the organization, such as the board, managers, shareholders, and other stakeholders, and lays down the rules and procedures for decision-making."[17] Recognizing that the objectives of other stakeholders significantly affect firms' behavior and that a widely held firm is a rare phenomenon, Berglöf and von Thaden (1999) argued in a similar manner that the market-based corporate governance paradigm should not only be broadened to include the problem of owner-controlled firms by large blockholders, but should be generalized to a model of multilateral negotiations and influence-seeking among a number of different stakeholders. In these settings, a conflict between shareholders and managers, which characterizes the modern corporate governance paradigm, becomes of minor importance because this type of principal-agent relation allows for a tighter link between shareholders and managers. Moreover, mechanisms such as product market competition, peer pressure, and labor market activity compensate for the weakness of finance in its role of disciplining device.

3.1.1 German codetermination

Codetermination means active participation of employees in the firm's decision-making process. As argued by Pistor (1999), codetermination gives economic power to those that control the means of production and uses employees' participation as a tool to counter the interests of capital and thus to offer social governance. The concept originates in the social movements of late nineteenth-century Europe. It was established as a means to overcome the contradiction between the classical liberal ideals of self-determination and the rights of the individual on the one hand, and on the other hand the reality of industrialization that, as Marx pointed out, alienated workers from the fruits of labor. Today, codetermination in Germany is implemented at the shop-floor level through workers' councils and at the corporate level through employee and union representation on supervisory boards.[18] Of course, codetermination has important implications for corporate governance and the development of the capital market, such as a diluted supervisory board, multi-party governance, and blockholdings.

[17] Consistent with the definition in Cadbury report (1992).

[18] Germany is by no means the only example. Wymmeersch (1998) documented several other countries, such as Austria, the Netherlands, Denmark, Sweden, Luxembourg, France, and Finland, that have some form of codetermination.

Codetermination, as it is known today, evolved after World War II. However, in order to understand the reasons for its emergence, one has to go back to the prewar period of fascism. Fascist power was rooted in the alliance between powerful private capital with the political regime. The coal and steel industry politically exploited the tremendous economic power that had accumulated to the detriment of the German people. It is no surprise then that the prevailing view after the war was that political democracy must be combined with social constraints over the use of private capital, a concept termed economic democracy (Kübler, 1978).[19] Codetermination was implemented through legislation on corporate codetermination in the coal and steel industries (the Montan sector) in 1951 and in a 1952 law on the internal organization of firms. The 1951 law granted employees equal representation on supervisory boards in the Montan sector, and the 1952 law revived firm-level employee participation. The 1952 law gave employees the right to delegate employees to the supervisory board if the firm had more than 500 employees and also required the board to reserve one-third of the seats for employees in firms from other industries. However, only the 1976 Codetermination Law extended equal representation on the supervisory board to all of the largest firms in Germany (Pistor, 1999). Today some kind of board representation is thus required for all firms with more than 500 employees. In any limited liability firm with a number of employees between 500 and 1,000, one-third of the board seats are taken by employees' representatives. The same requirement applies to limited liability firms with 1,000 to 2,000 employees, except those in the Montan sector, where the required employee representation amounts to one-half. Equal representation is also required for firms with more than 2,000 employees (Gurdon and Rai, 1990).

Based on the empirical evidence available, it would be difficult to draw any strong conclusions about the effects of codetermination on a firm's performance. Baums and Frick (1999) pointed out that there are a limited number of studies that investigate the influence of employee participation on supervisory boards on the performance of German firms; however, they concluded that codetermination laws have had a rather modest, if any, influence on the performance of firms and sectors affected.[20] Studies on the influence of unions on productivity report overall negative but insignificant effects, and those on the impacts of workers councils likewise produced no clear conclusions.[21] Baums and Frick (1999) cited several methodological problems of these studies, such as small samples, studies concentrated on single events without considering possible anticipation, difficulties in controlling for other factors, and so on. Pistor (1999) added that it is difficult to judge whether codetermination strengthens the role of

[19] Article 14 of the 1949 Constitution, for example, explicitly stated that property rights are not only a right but also an obligation, and that the exercise of private property rights shall also benefit society as whole.

[20] Other individual studies include Svejnar (1981, 1982a, b), Benelli et al. (1987), Gurdon and Rai (1990), and FitzRoy and Kraft (1993).

[21] Studies on the productivity effects of unions include Addison et al. (1989), Kraft (1992), Lorenz and Wagner (1991), Schnabel (1989), Schnabel and Wagner (1992), and Mainusch (1992), and those on the impact of workers' councils include Addison et al. (1993), Addison and Wagner (1995), Addison et al. (1996), FitzRoy and Kraft (1985a, b, 1987a, b, 1990), Frick (1996a, b), Frick and Sadowski (1995), and Kraft (1986).

employees because all of the studies face the problem that, given many deficiencies of the supervisory board before enactment of codetermination, it is difficult to attribute the fact that employees do not exert the type of influence that was expected to a failure of codetermination.

However, one can clearly recognize the dynamics of corporate governance in response to codetermination. Pistor (1999) argued that it can be expected that codetermination raises the cost of collective decision-making and agency costs by increasing the heterogeneity of interests represented on the supervisory board. In addition, it alters the relationship between the supervisory board and the management from a bilateral one to a multiple-party arrangement characterized less by control and more by coalition building. For these reasons, codetermination led to a reallocation of power and responsibilities of the supervisory board, executive board, and shareholder meeting. According to a study conducted by Gerum et al. (1988), many firms changed the rules governing internal affairs of the supervisory board in the expectation that the 1976 Codetermination Law would restrict the power and responsibilities of the supervisory board. There was also a strong tendency to strengthen the shareholder bench of the supervisory board by enacting provisions such as an additional shareholder deputy of the supervisory board (under German corporate law, the first deputy is the employees' representative and the chairman is the shareholders' representative), shareholder-controlled subcommittees, enhanced power of the chair to control the agenda, quorum rules that favor capital, additional authority of the chair to postpone a substantive action if the chairman could not be present, the requirement that the chair cast the tie-breaking vote when such a vote is necessary, and requiring board members to refrain from making statements out of the boardroom. However, despite many attempts by shareholders and management to reduce the influence of employees through formal changes to company law, Pistor (1999) asserts that in most cases the 1976 codetermination law was implemented without many compromises.

Based on interviews conducted with the representatives of various parties such as labor unions, political parties, and legislators, Pistor (1999) argued that the positive aspects of codetermination outweigh the negative ones. One of the most important positive aspects is that it involves employees in a firm's decision-making process at a relatively early stage. Although the inclusion of employees in the firm's decision-making process at a relatively early stage prolongs decision-making in matters that negatively affect employees, it is believed that employee participation significantly reduces the potential for conflict when such measures do take effect. The related goal of codetermination is also to give employees an opportunity to participate in shaping the firm's long-term strategy; however, employee representatives on the supervisory board continue to specialize in employee matters, such as work place, social concerns, wages, and benefits. On the other hand, there is a widespread opinion that codetermination affects corporate governance such that it makes it harder to control management. Codetermination fractionalizes supervisory boards, dilutes the supervisory board's power and responsibilities, and induces coalition building or collusion by one of the two benches with the management. Pistor (1999) concluded that

codetermination pitted capital and labor against one another rather than uniting them in the task of controlling management, and thus, as already pointed out by Mertens and Schanze (1979) at the time the 1976 Codetermination Law was enacted, set the rules for multiparty governance so as to benefit management rather than employees.

Roe (2003) argued that codetermination also undermines diffuse ownership and thus capital market development because diffuse owners are unable to create a blockholding balance of power that shareholders would prefer as a counterweight to the employee block. During the 1980s and 1990s, managers and shareholders also failed to turn the supervisory board into a serious governance institution in the face of the global competition and technological change required by diffuse owners. In addition, Germany has been historically weak on competition and lacks takeovers, two other monitoring mechanisms. Codetermination thus fits better with the semi-private, closely held nature of firms than it does with truly public, diffusely held firms in which mechanisms other than blockholdings are available.

3.1.2 Japanese lifetime employment

Japan is another country where insiders have a distinctive role in corporate governance. In Japan large firms guarantee many employees lifetime employment. As argued by Roe (2003), the system of lifetime employment originates in the post–World War II period of devastation and labor strife and was an answer to strikes following labor mass dismissals. Lifetime employment and a complementary closed external labor market tend to provide incentives for firms to invest in employees' human capital and to support other corporate governance institutions, such as inside boards and the main bank creditor-owner system.

The conventional view is that Japanese firms promised lifetime employment to give employees the proper incentives to invest in human capital (Blinder, 1992; Garvey and Swan, 1992; Mincer and Higuchi, 1988; Gordon, 1985) and encourage skills acquisition and maintain a high level of effort (Kanemoto and MacLeod, 1991). However, Roe (2003) argued that it is not the institution of lifetime employment alone, but its complement (a closed external labor market) that helped develop human capital investments incentives in Japan. He argued that lifetime employment resulted more from political forces than from human-capital based economic forces, and that it was only when lifetime employment was in place that the complementary institution of a closed external labor market developed to support human capital investments.

Roe (2003) argued that stable employment is not a continuous Japanese cultural tradition, but emerged only after World War II in the period of devastation and labour strife. It was an answer on strikes following labour mass dismissals which threatened managers not just by halting production but in many cases by taking over and running the firms without managers.

Conservative political and business leaders could have decided on lifetime employment for favored sectors to diminish the chance of socialist electoral success in response to industrial restructuring; meanwhile, when managers sought to economize production in a restructured firm, they might have privileged the surviving employees with lifetime employment to reduce labor unrest after the restructuring. He further argued that firms' promise of lifetime employment did not motivate employees to make human capital investments because it failed to eliminate employees' rational fears of firms' opportunism in lowering wages or in promoting fewer people. Even payment by the firm could not solve this problem because it risks, on the other hand, employees' opportunism. Therefore it required the external labor market to close for firms to be less wary of paying to develop the skills of their employees. If the external labor market is closed, neither employees nor competitors can appropriate the returns of human capital investments. Lifetime employment might also dilute employees' incentives to perform.

The system of lifetime employment that was in place in Japan until the mid 1950s persisted in the economically strong 1960s and can still be observed today. Roe (1999) offered four hypotheses for its prevalence. First, individual managers may have remembered the postwar labor strife and feared losing any such conflict if they ended lifetime employment in their firm. Second, lifetime employment was supported by Japanese courts. Third, managers may have considered poaching employees from other firms as a threat to the morale of the firm's existing employees and thus the effectiveness of the internal labor market. With lifetime employment, internal promotions became the normal way to advance, and thus bringing in outsiders would risk demoralizing existing employees. Fourth, the Japanese government may have helped destroy the external labor market because a weak labor market is critical for Japanese human capital investments.

In a similar manner, Aoki (1994) stressed the need to consider an entire governance system rather than just one attribute. Milgrom and Roberts (1994, 1995) argued that complementary institutions reinforce each other. Once Japanese social peace led firms to promise lifetime employment, the firms encountered problems with human capital investments and productivity problems. Most reactions affected labor institutions, and fewer of them have corporate governance implications. As already mentioned, lifetime employment required the external labor market to close, as well as specific compensation and promotion schemes. Kandel and Pearson (1995) argued that compensation and promotion schemes, in which bonuses (in contrast to fixed wages) play the most important roles and internal competition promotes better-performing employees, emerged to offset the job security provided by lifetime employment.

The most evident corporate governance implications include inside boards and the main bank creditor-owner system. Japanese boards are almost entirely comprised of insiders and, moreover, they are very large (Roe, 2003). Older employees, in whom the firm has invested a lot, should be especially valuable and it is in the firm's interest for them to stay with the firm. Promoting some employees from managerial positions to the board is also a way to make room for new entrants.

Finally, these are honorary and prestigious promotions after a lifetime of excellent service. Lifetime employment also fits with the typical ownership structure. Aoki et al. (1994) asserts that in Japan the only shareholders that can readily influence managers are shareholders that are also the firm's bankers. This restricts shareholder influence because banker-shareholders do not seek pure shareholder wealth maximization because their risk aversion matches more closely with the preferences of employees than those of shareholders, as well as protects employees from the opportunism of shareholders that might want to end lifetime employment. On the other hand, managers are not free from all accountability because if corporate results are bad the main bank will intervene. This motivates managers and employees to perform to maintain autonomy from the banker-shareholders. An analogous explanation was provided by Gilson and Roe (1999), who argued that after employees won lifetime employment the firm had to evolve to balance keeping shareholders from reneging and perhaps reigniting the strife, as well as putting into place means to monitor managers, especially if internal labor competition led to large insider-dominated boards. Thus large bank-shareholders emerged.

3.1.3 Corporate governance arrangements in other European countries

It is interesting that at the beginning of the twentieth century France had securities markets that were as strong as those in United States (Rajan and Zingales, 2003). However, as argued by Roe (2003), as in many European countries after World War II, politics in search of social peace moved to the left and denigrated the shareholder value model. The socialist elite, as well as its political competitors, pressed firms to stabilize employment inside the firm. Political leaders threatened profitable firms seeking to downsize with denying them discretionary governments benefits if they persisted.[22] The state was actively involved in takeovers because restructuring often led to downsizing. Historically, ministerial approval was necessary and the ministry rarely approved a takeover without a social plan in place. The aspirations to preserve social peace had important corporate governance implications. As a means to resist takeovers, especially those that would lead to layoffs, employee stock ownership emerged. Roe (2003) argued that, in contrast to the purpose of employee stock ownership plans in Anglo-Saxon countries, in France this was aimed to shift the balance of power inside the firm. He also found that because of tensions inside the firm French firms hardly use incentive compensation. Inability to use appropriate incentive compensation, as well as managers' reluctance to pursue restructuring activities that includes downsizing, and their social interest orientation, raises agency costs in the public firm. Finally, French corporate law encourages managers to run the firm in the general social interest for all the stakeholders in the firm (Fanto, 1998). The potential gap between managers and shareholders would thus seem wide in a firm with diffuse owners, and this is why the firms' founders are not willing to sell into the securities market because the firm is worth less

[22] A 1975 law required firms seeking to make more than 10 layoffs for economic reasons to obtain permission from the local inspector for the ministry of labor. These were by no means granted automatically (Levy, 1999).

to diffuse owners, and thus the market has not developed back to its prewar ranges. It is no surprise then that until recently, when French politics moved rightwards, family firms persisted in France, with few truly public firms.

Italy is another country where there are few public firms and the corporate sector is dominated by small family firms. On the one hand, Italian courts, regulators, and practices are reputed to be ineffective in preventing controlling shareholder machinations. Shleifer and Vishny (1997) argued that, if minority shareholder rights are not well protected, investors will compensate for the deficiency by taking controlling stakes. In addition, La Porta et al. (1997) empirically confirmed that countries with poorer investor protection, measured by the character of legal rules, as well as the quality of law enforcement, experience a less developed capital market.[23] However, weak corporate law and the legal theory developed by La Porta et al. (1997, 1998) is only part of the story. Roe (2003) argued that because social conflict has been always high in Italy, labor-management cooperation has been low, labor-influenced parties have been powerful, and the Communist Party was supported by a quarter of the Italian electorate for several decades, the Italian Christian Democratic governments fostered small closely held firms and cooperatives. One reason they did so was because they thought employees would identify with the owners in small firms, but oppose them in large firms. Moreover, neither Italy's Communist Party nor the Christian Democrats sympathized with profit-enhancing institutions. Italian and political and social thought, one on the left and the other on the right, was dominated by Marxist and Catholic ideology that did not respect the market (Carli and Pelufo, 1993).

Sweden, on the other hand, has many public firms and a well-developed stock market. However, there are few US-style public firms with diffuse owners because insider shareholders dominate ownership. Sweden protects minority shareholders rights well, and therefore legal theory cannot explain concentrated ownership. Roe (2003) thus argued that one needs to add employees and social democratic pressures into the Swedish equation in order to explain why ownership has not separated from control. Like other Scandinavian countries, Sweden has been one of the strongest social democracies. Namely, social democracy tends to affect ownership in two ways. First, a concentrated owner has stronger incentives than an unconstrained manager to avoid giving up too much shareholder value to social pressures. Second, if a concentrated owner is progressive, has a social conscience, and is not a shareholder-wealth maximizer, then the political authorities and voters prefer the incumbent over someone else that might seize control. Roe (2003) concluded that in Sweden corporate control-based benefits are protected; however, the protected control benefits are governmental and social value in the corporation, not the owner's private benefits.

Finally, distinctive corporate governance settings also emerged in European transition countries. It is true that different countries took different approaches to economic system transformation,

[23] Of course, the legal theory can be used to explain corporate governance arrangements in other countries; however, I found the political theory developed by Roe (2003) more plausible. This is why it is usually ignored elsewhere.

from those that preserved as much social component as possible to those characterized by harsh neoliberalism. Although they face rather different outcomes today, these countries share many similarities. Because of the remains of the former economic systems in which equality and employees' rights were promoted, most of the European transition countries have implemented codetermination in their company laws. Commonly used management and employee buyout privatization schemes resulted in a strong insider ownership at the beginning of transition. Moreover, the power of insiders in firms' decision-making has not been significantly reduced by the blockholders that emerged when dispersed outside investors in a poor institutional environment, compensating for low shareholder rights protection, consolidated initial ownership structures (Črnigoj et al., 2008). Moreover, due to the ongoing economic crisis, there are serious doubts in European transition countries about adopting the neoliberal principles that were until recently perceived as inevitable. Reversing reforms in these countries toward adopting more social components thus results in further convergence.

3.1.4 The United States and the United Kingdom as role models of shareholder value

Although it was thought that the United States most closely resembles a shareholder society, it is becoming widely believed that US firms' governance structures diverge from the shareholder value model. Roe (1994) characterizes this corporate governance arrangement as distant shareholders, a board of directors that has historically deferred to the CEO, and powerful, centralized management. This distinctive corporate governance arose in part as an aspiration for specialization (shareholders should specialize in risk-bearing, and managers in professional management), and in part as a result of political decisions about the role of financial institutions.

Roe (1994) cites three main reasons for the distinctive US corporate governance. First, American public opinion has always mistrusted large institutions. The widespread attitude that large institutions and accumulations of centralized power are inherently undesirable and should be reduced emerged in the 1890s in the agrarian political movement. Later, this populism characterized antitrust attacks on big businesses and, moreover, it restricted the dominant financial institutions. Fragmented American banks lacked the size to take big ownership shares in the large firms emerging at the end of the nineteenth century. Their products and portfolios were further restricted by being barred from securities business and from owning stocks. Insurers could not buy stocks for most of the twentieth century. Mutual funds cannot easily devote their portfolios to big blocks and they face legal problems if they go into the boardroom. Pension funds cannot take big blocks either, and moreover they are normally under managerial control. Second, interest group politics were very important. The winners of the conflict with big institutions were small businesses, small financial institutions, and eventually managers. Once banking interests were fragmented, there was a powerful and influential interest group that would

resist financial concentration: the already fragmented bankers. In addition, according to public opinion financial institutions should be kept out of stocks because of the risk of institutional insolvency, conflicting interests, and possible financial monopolies. Third, the structure of the American federal system and the US Congress gave these local interests a loud voice.

Roe's political explanation thus predicts Berle and Means' corporation as inevitable. Berle and Means (1932) argued that when the number of shareholders of the firm increases, each shareholder's voice becomes of minor importance, and shareholders face a collective action problem when deciding to become involved in monitoring and taking action. As a result, firms obtain passive shareholders, but strong managers that control the firms. However, the agency problem that characterizes the relationship between shareholders and managers did not threaten the survival of the American public firm. Even if the US corporate governance system has some bad features, it is believed that its strengths are overwhelming. It facilitates economies of scale and professionalized management. In addition, managers' divergent behavior is reduced because of managers' fiduciary duties and the threat of class-action suits, managerial incentive schemes, and threats of takeover and proxy fights, as well as competition in the product market. Third, as argued by Roe (1994), the US public firm survived because it reduced the severity of its weakness.

Finally, one cannot fail to notice the growth of employee stock ownership plans (ESOPs), which developed as an outgrowth of employer-sponsored retirement systems. Legally speaking, an ESOP is a defined-contribution employee benefit plan that primarily invests in the stock of the company sponsoring the plan. An ESOP has a trust that acquires shares of the firm on behalf of its employees. The popularity of ESOPs stems from their tax advantages, which on the one hand assure a preferred source of equity capital, and on the other creates a market for the shares of small business owners that lack a family successor and do not want to sell out to a larger firm or that prefer to gradually phase out their participation in the firm.[24] Other motivations include the use of ESOPs as a defense against takeovers and as a way of saving failing firms by transferring ownership to employees (Dow, 2003). According to the National Center for Employee Ownership (1999), ESOPs held about $500 billion of assets, and other forms of employee ownership such as stock options were worth about $300 billion. This accounted for 8 percent of corporate stock, up from 3.87 percent in 1983 (Blasi, 1988).

Although voting rights on the shares held by an ESOP must be passed through to employees, this does not mean that employees' representatives obtain seats on the board of directors. Blasi and Kruse (1991) argued that managerial workers serve on the board in fewer than 10 of 1,000 publicly traded firms with the highest employee ownership. Again, one can conclude that ESOPs benefit managers and not employees, as expected. However, it is far from clear when the US

[24] Contributions to an ESOP can be deducted from corporate taxes up to 25 percent of annual payroll for eligible employees; moreover, firms can deduct dividend payments on shares held by an ESOP.

trend toward more employee share ownership will stop. Dow (2003) argued that the upper bound might result from the limited willingness of employees to pay for retirement benefits out of current wages. Blasi and Kruse (1991) hazarded a guess that replacing benefit costs with a system of employee ownership would not generate more that 20 percent employee ownership in most of the firms. Another potential limit on ESOPs is the degree to which employees are willing to forego the diversification of personal wealth, and yet another might be the reluctance of outside investors to put themselves at the mercy of a voting majority of employees. However, if increased employees ownership can deliver large productivity gains, perhaps primarily in conjunction with other innovations such as participative organizational culture, then employee ownership and their role might further increase.

Having determined that the US departs from the shareholder value model, the United Kingdom is the only candidate left. Indeed, UK firms tend to bear the closest resemblance to the shareholder value model. As argued by Roe (2003), the UK by many measures had more public firms and deeper securities markets than any other country, although families held block and managerial positions until late in the twentieth century. British securities markets developed under a conservative laissez-faire policy. However, many firms' ownership did not separate from control. Moreover, Chandler (1990) argued that the largest British firms were family-owned as late as World War II and that this control persisted. Because of the persistence of power of the previously built structures, private corporate structures were not replaced even under the Labour Party government in the postwar years. In the ensuing decades, British polity moved right, not only with Margaret Thatcher, but also with Tony Blair, under whom the Labour Party became less of a social party compared to its orientation under his predecessors. Recently, British markets increased massively, much more than markets in the US. Most of the remaining family owners also sold off their blocks.

3.2 The new theory of the firm

Coase (1937) suggested that transactions that are typically conducted within the firm are not governed by the price mechanism, but by direct authority. The widely accepted property rights theory, which was recently substantially developed by Grossman and Hart (1986), Hart and Moore (1990), and Hart (1995), differentiates authority or power from the price mechanism because authority (in contrast to the price mechanism) involves the exercise of rights that are not contractible – residual rights of control. According to the property rights theory, power stems from ownership of physical assets. Hence, the firm is nothing but a collection of physical assets.

It is no surprise then that there was no room for people in the existing theory of the firm, given that people cannot be owned.[25]

Of course, ownership of physical assets is not the only source of power within the firm. Rajan and Zingales (1998), for example, argued that power stems from control over a critical resource and that the main mechanism to allocate power is access (i.e., ability to use or work with the critical resource). The agent that is given privileged access to the resource obtains no residual rights of control, but the opportunity to specialize his human capital to the resource and make himself valuable. Combined with the preexisting residual rights to withdraw his human capital, access gives him the ability to create a critical resource that he controls – his specialized human capital. On the other hand, Aghion and Tirole (1997) argued that formal authority need not confer real authority. A principal that has formal authority can always reverse a subordinate's decision, but will refrain from doing so if the subordinate has better information and if their objectives are not too diverse. Formal authority with the principal thus prevails only when the principal is well informed, whereas a poorly informed principal normally rubber-stamps a subordinate's proposal and thus gives real control to the subordinate. Aghion and Tirole (1997) thus identified another source of power: information.

Highlighting alternative sources of power, the new theory of the firm defines the firm in terms of unique assets, as well as in terms of people that have access to critical resources or have information. Moreover, it brings stakeholders other than shareholders within the boundaries of the firm. In contrast to the property rights theory, the new theory of the firm considers managers, as well as employees, to be an important part of the firm. Shareholders are thus not the owners of the firm and have a prominent position in the firm because no one can own a firm if it consists of people. As argued by Dow (2003), all that it is possible for them to own are assets used by the firm, claims on the net income from the firm's activities, and perhaps a controlling position in the firm's governance structure. Therefore, when someone is buying a share of a firm, he is buying a role or position in the firm's coalition. This is the role of being a shareholder of the firm and gives someone nothing but a collection of rights that includes the right to receive dividends, the right to a share of the firm's assets if the firm goes bankrupt, and the right to vote at shareholders' meetings. Moreover, being a residual claimant does not directly imply control, which follows from neoclassical theory, according to which the "owner" of the firm chooses the production plan, pays the prevailing market prices for inputs, sell the output at market prices, and keep the profit. In a world of incomplete contracts in which input suppliers have rents at stake, it is less obvious that a single agent could be singled out as a residual claimant and be awarded control rights on efficiency grounds.

[25] The exception is the literature that focuses on the principal-agent relationship. Despite being a big step in the understanding of the nature of the firm, it considers only shareholders and managers and their relationship.

3.2.1 Access and control over critical resource as a source of power

Because ownership of physical assets is not the only source of power within the firm and the firm is more than a simple collection of assets, Rajan and Zingales (1998) developed a more general theory of power within the firm and thus a more general theory of the firm. They argued that power stems from control over a critical resource and that the main mechanism to allocate power is access (i.e., ability to use or work with the critical resource). An agent that is given privileged access to the resource obtains no residual rights of control, but does obtain the opportunity to specialize his human capital to the resource and make himself valuable. Combined with his preexisting residual rights to withdraw his human capital, access gives him the ability to create a critical resource that he controls – his specialized human capital. Highlighting alternative sources of power, Rajan and Zingales' theory of the firm defines the firm in terms of unique assets, as well as in terms of people that have access to the critical resources. Moreover, it brings stakeholders other than shareholders within the boundaries of the firm. In contrast to the property rights theory, their theory of the firm considers managers, as well as employees, to be an important part of the firm.

Rajan and Zingales (1998) argued that by regulating access to the critical resource the owner of the firm affects managers' or employees' abilities and incentives to invest. Meanwhile, by specifying who is given access and who is not, the owner defines the ex ante boundaries of the firm. The boundaries of the firm critically depend on the way specific investments combine. Based on the nature of the bargaining process between the owner and the manager or employee whose help is needed by the owner to produce the product, they argued that, when investments are substitutes, it is better for the owner to give access to one manager or one employee. If one considers a milder form of substitution, investments become additive. When investments are additive, it turns out that the owner is better off giving access to more than one manager or employee. When investments are complementary, they again found that that the owner does not want to give access to multiple managers or employees.

Comparing the concept of access with ownership defined in the property rights theory, Rajan and Zingales (1998) argued that, in contrast to the property rights theory, according to which there is no sense in an agent belonging to the firm, the firm is defined as a collection of commonly owned critical resources, talents, ideas, and people that have access to those resources. Moreover, the right to offer access belongs to anyone that has command over a valuable source of rents and can certainly emanate from the ownership right. The regulation of access also does not need outside authority to enforce it, as is the case with ownership. Finally, they argued that access can be a better mechanism than ownership to provide incentives to make specific investments because the power over the surplus that the agent receives from access is likely to be more contingent on making the investment than power coming from ownership. When the agent obtains an ownership right over a physical asset, he unconditionally obtains the residual rights of

control over the asset, whereas the agent that is given access receives no residual rights of control. All that the agent is given is residual rights to withdraw his human capital. What access does is to allow him to make this residual right valuable by giving him the opportunity to specialize his human capital.

Rajan and Zingales (1998) argued that, even when property rights do exist and are enforced, access is often used in preference to ownership because ownership can adversely affect incentives to make specific investments. Therefore, they suggest that if all parties involved in production, including the owner, have to make substantial specific investments, it is optimal that an unrelated third party own the assets.[26] Even if ownership does not reduce the incentive to specialize per se, it can crowd out the incentives created by regulated access. Ownership is also a commodity of limited supply, so if many agents require incentives to specialize, regulation of access is an important alternative mechanism. However, access and ownership need not be substitute mechanisms, although they can be mutually reinforcing. Internal organization, which is nothing but the regulation of internal access, can help an ownership structure to achieve first best.

3.2.2 Information as a source of real control

Aghion and Tirole (1997) distinguished formal authority (i.e., a right to decide) and real authority (i.e., effective control over decisions within the firm). They argued that formal authority need not confer real authority. A key to their analysis is asymmetric information. A principal that has formal authority can always reverse a subordinate's decision but will refrain from doing so if the subordinate has better information and if their objectives are not too diverse. Formal authority with the principal thus prevails only when the principal is well informed, while a poorly informed principal normally rubber-stamps a subordinate's proposal and thus gives real control to the subordinate. Aghion and Tirole (1997) thus identified information as another source of power and, similar to Rajan and Zingales (1998), allowed other stakeholders to gain control within the firm.

In addition to the important concept of real authority, Aghion and Tirole (1997) analyzed the optimal delegation of formal authority to subordinates. On the one hand, delegation of formal authority to subordinates facilitates agents' participation in the organization and fosters their incentive to acquire relevant information about activities. On the other hand, it involves a costly loss of control. Because of this trade-off, Aghion and Tirole (1997) argued that formal authority is more likely to be delegated for decisions or activities that are relatively unimportant for the

[26] More precisely, the optimal ownership changes during the life cycle of the firm. When an entrepreneur starts, he is the only one making specific investments and there is little value to speak of. At this stage, the entrepreneur should own the firm. Once the firm becomes larger, specific investments by others become important, and the amount of future rents increases. Then a third party should own the firm.

principal, for which the principal can trust the agent, for decisions or activities that are important to the agent, either because private benefits are high or because the principal cannot refrain from hurting the agent, and for decisions or activities that are sufficiently innovative that the principal has not accumulated substantial prior expertise or competency. Aghion and Tirole (1997) also showed that centralization (i.e., non-delegation of formal authority) may hurt communication by making the agent concerned about being overruled, although it can also favor communication when the agent trusts the principal. Real authority is eventually determined by the structure of communication.

Aghion and Tirole (1997) argued that the agent's real authority increases with the span of control, monetary incentives, multiple principals, reputation, and urgency in decision-making. Increasing the span of control reduces the principal's abilities to monitor and therefore the probability that the principal will overrule the agent, which consequently increases the agent's incentives and makes it more likely that the agent will make a decision. A higher wage increases real authority for two reasons. First, by raising the agent's incentives, it is more likely that the agent will be able to recommend a project, and second it reduces the principal's incentive to monitor and therefore the probability that the principal will overrule the agent. Spreading monetary benefits among several principals generates free-riding, thus reducing monitoring and therefore raising initiative and resulting in a loss of control. It is also well known that superiors try to develop reputations for not intervening too often or intervening only when justified, meaning that they use authority to overrule only in important matters but relinquish authority in matters that are less important. Similarly, it is expected that superiors are more likely to rubber-stamp a decision when it is more urgent.

3.3 Stakeholders' claims and their objective functions

Reviewing corporate governance systems around the world, as well as the new theory of the firm, one can conclude that there are stakeholders other than only shareholders constituting the firm and affecting its behavior. Stakeholders that directly affect the firm's behavior in addition to the shareholders are creditors, employees and managers. Another stakeholder that tends to have significant power to affect the firm's behavior is the state. Because the state has no direct claim in the firm, except the taxes it collects, I restrict my analysis to shareholders, debt holders, employees, managers, while taking into account the role of the state as a stakeholder creating the norms and limits within which each stakeholder's interest are being satisfied. In addition, I assume that the state has some vested interest, such as social peace, that significantly affects the relations among the firm's stakeholders.

Let us say that the claims of these stakeholders are either fixed or residual, or some combination of the two. A fixed claim, such as debt, is a claim to a predetermined level of the firm's income,

and a residual claim, such as equity, is a claim to a profit beyond that level. Such an elementary description of the stakeholders' claims, ignoring various factors affecting their values, is of course oversimplistic. However, it is good starting point to hypothesize about employees' and managers' objective functions and thus the goal of the stakeholder-oriented firm.

Following Merton (1974), the value of any stakeholder's claim ($F(V)$), if the firm's assets value follows a diffusion process with constant volatility of the rate of return (σ):

$$\frac{dV}{V} = \mu(V,t)dt + \sigma dW ,$$

in which W is a standard Brownian motion, must satisfy the following partial differential equation:

$$\frac{1}{2}\sigma^2 V^2 F_{VV}(V,t) + rVF_V(V,t) - rF(V,t) + F_t(V,t) + C = 0 .$$

To determine the value of the claim, we first substitute for F in the above equation, and then, armed with boundary conditions, solve the equation for the value of the claim by the standard methods of Fournier transformation or separation of variables. For some claims, we can solve the valuation equation directly because some similarities with existing securities and their valuations have already been found in the literature (Merton, 1974).

3.3.1 Shareholders and debt holders

Shareholders hold a residual claim, meaning that they receive any profit left after all the firm's liabilities have been paid off. The intuition behind determining the value of various stakeholders' claims is the following. By levering the firm, shareholders essentially sell the firm's assets to the fixed claimants, say debt holders for the value of debt. However, they retain an option to buy them back for the face value of debt when the debt matures. The residual claim is thus nothing but the call option on the firm's assets with the exercise price equal to the face value of debt.

As already stated, one could determine the value of the equity claim by substituting for F in the above equation and then, armed with boundary conditions, solve the equation for the value of the equity claim by the standard methods of Fournier transformation or separation of variables. However, as noted by Merton (1974), the inspection of the equation for the value of the equity claim shows that it is identical to a European call option on a non-dividend–paying common stock in which the firm's value (V) corresponds to the share price and face value of debt (B) to

the exercise price. The price relationship between the levered equity and a call option can thus be solved directly using Black and Scholes' (1973) equation or Merton's (1973) equation as:

$$E(V,t) = VN(d_1) - Be^{-rT}N(d_2),$$

in which:

$$d_1 = \frac{\ln(V/B) + (r + \sigma^2/2)T}{\sigma\sqrt{T}} \text{ and}$$

$$d_2 = d1 - \sigma\sqrt{T}\ .$$

The valuation of Black and Scholes' (1973) equation or Merton's (1973) equation can be explained by looking at $N(d_1)$ and $N(d_2)$ as risk-adjusted probabilities that the call option will expire in or out of the money. When the terms have values close to 1, meaning that there is a high probability that the option will be exercised and thus the debt will be repaid, the value of the equity claim is equal to $V - Be^{rT}$. This is equal to the firm's intrinsic value. On the other hand, when the value of the terms have values close to zero, meaning the option will expire unexercised and the firm will default on its debt and thus go bankrupt, the value approaches zero.

Shareholders thus seek to maximize the value of the call option on the firm's assets. One can identify five factors that affect the value of a call option: the share price, exercise price, volatility of the share price (σ), time to expiration (T), and interest rate (r). The value of the option should increase with the share price, volatility of the share price, time to expiration, and interest rate, whereas it decreases with the exercise price. Shareholders thus seek to maximize the value of the firm; that is, the share price.

Debt holders hold a claim at a predetermined level of the firm's income, and thus they are fixed claimants, in contrast to shareholders. Debt holders are repaid and earn interests if the firm is solvent, and shareholders exercise the call option on the firm's assets and buy back the firm's assets, while they receive or retain the firm's assets if the firm goes bankrupt. Assuming that put-call parity holds, one can find that the value of the firm's debt is equal to the difference between the value of the firm's debt discounted at a risk-free rate and the value of the put option on the firm's assets.

In order derive the value of debt, let us first introduce another view on the value of debt. By levering the firm, shareholders commit to repaying the debt with certainty if they retain the option to sell the firm's assets to the debt holders for the value of debt, even if the value of the firm's assets is less than the value of debt. The ability to sell the firm's assets for the price of the

debt thus represents a put option, which guarantees that shareholders can raise enough funds to repay the debt simply by turning over the firm's assets to debt holders. The equivalence of both approaches to the value of debt is nothing but the put-call parity theorem, which represents the relationship between the put option and call option prices.

No arbitrage condition requires that in equilibrium the payoff of a protective put portfolio, comprising a stock position (S) and a put option in that position (P), equals the payoff of a portfolio of a call option (C) and treasury bills with a face value equal to the exercise of the call (X) and the maturity date equal to the expiration date of the call:

$$C + \frac{X}{(1 + r_f)^T} = S + P .$$

In our setting, in equilibrium the payoff of a protective put portfolio, comprising of firm's assets (V) and a put option on the firm's assets (P), equals the payoff of a portfolio of a call option on the firm's assets (C) and the face value of the firm's debt (B) discounted at a risk-free rate (r_f), thus:

$$C + \frac{B}{(1 + r_f)^T} = V + P .^{27}$$

Rearranging the theorem as:

$$V = C + \frac{B}{(1 + r_f)^T} - P \text{ and}$$

combining it with the equation for the value of the firm, $V = E + D$, it can be shown that the value of the firm's debt (D) equals the difference between the face value of the firm's debt (B) discounted at the risk-free rate (r_f) and the value of the put option on the firm's assets (P):

$$D = \frac{B}{(1 + r_f)^T} - P .$$

As found in the previous section, the value of the firm's equity capital (E) is nothing but the value of the call option on the firm's assets (C).

[27] Like the treasuries, the firm's debt is in the form of zero-coupon bonds.

The value of the put option (P) is equal to:

$$P = Be^{-rT}\left[1 - N(d_2)\right] - V\left[1 - N(d_1)\right],$$

and thus the value of risky debt (after some manipulation) can be written as:

$$D = Be^{-rT}N(d_2) + V\left[1 - N(d_1)\right].$$

The value of debt is equal to the payoff to debt holders when the firm is solvent and the debt repaid, and the expected recovery given bankruptcy, weighted by the probabilities of bankruptcy. As long as the firm's assets exceed the value of debt, the value of debt is invariant to firm value, whereas it falls proportionally to the value of the firm's assets when the value of debt exceeds the value of the firm's assets.

Leland (1994) extended the result to include bankruptcy costs. He showed that the value of infinite time horizon debt $D(V)$ paying a constant coupon (C), assuming that the firm goes bankrupt at the assets value V_B and that the fraction of assets $0 \leq \alpha \leq 1$ is lost to bankruptcy costs, is equal to:

$$D(V) = C/r + \left[(1-\alpha)V_B - C/r\right]\left[V/V_B\right]^{-X},$$

in which

$$X = \frac{2r}{\sigma^2}.$$

The above equation can be rewritten as:

$$D(V) = \left[1 - p_B\right](C/r) + p_B\left[(1-\alpha)V_B\right],$$

if

$$p_B \equiv \left(V/V_B\right)^{-X},$$

and is interpreted as the present value of one monetary unit contingent on future bankruptcy.

Debt holders would thus maximize the value of debt by maximizing the value of its fixed contractual payments and minimize the value of the put option on the firm's assets. The put

option value decreases with the value of the firm's assets, whereas it increases with the volatility of the firm's operating cash flow. Debt holders thus seek to maintain the value of the firm's assets and they are risk averse.

3.3.2 Employees

Following Merton (1974) and Leland (1994), one can derive also the value of employees' and managers' claims. Employees' claims are mostly comprised of fixed wages and are thus fixed claims. Analogically to the logic of levering the firm, one can think of hiring employees as shareholders selling the firm's assets to the employees and retaining an option to buy them back for the amount equal to the wages owed to employees at the end of the month. Employees receive wages if the firm is solvent and the shareholders exercise the call option on the firm's assets, whereas they receive or retain the firm's assets if the firm goes bankrupt because the shareholders are unable to pay the wages. Another view on the value of employees' claim is that by levering the firm shareholders commit to repaying the wages owed to employees with certainty by retaining the option to sell the firm's assets to the employees for the amount of wages owed to employees, even if the value of the firm's assets is less than the amount of wages owed to employees. The ability to sell the firm's assets for the price of the amount of wages owed to employees thus represents a put option, which guarantees that the shareholders will raise enough funds to pay the wages simply by turning the firm's assets over to the employees. Assuming that put-call parity holds, it is found that the value of the employees' claim is equal to the difference between the value of the wages owed to employees discounted at a risk-free rate and the value of the put option on the firm's assets.

Substituting the face value of debt (B) with the amount of the wages owed to the employees (W) in the equation for the value of debt, the value of the employees' claim (L) is equal to:

$$L = \frac{W}{\left(1 + r_f\right)^T} - P \text{ or}$$

$$L = We^{-rT}N\left(d_2\right) + V\left[1 - N\left(d_1\right)\right].$$

Similar as found for the firm's debt, it is found that the value of the employees' claim is equal to payoff to employees when the firm is solvent and the expected recovery in bankruptcy weighted by the probabilities of bankruptcy.

The value of employees' claims can also be derived following Leland (1994). The value of an infinite time horizon employees' claim $L(V)$ paying a constant wage (W), assuming that the firm

goes bankrupt at the assets value V_B and that the fraction of assets $0 \leq \alpha \leq 1$ is lost to bankruptcy costs, is equal to:

$$L(V) = W/r + [(1-\alpha)V_B - W/r][V/V_B]^{-X},$$

which can be rewritten as:

$$L(V) = [1-p_B](W/r) + p_B[(1-\alpha)V_B],$$

if

$$p_B \equiv (V/V_B)^{-X}.$$

As debt holders, employees are aimed at maximizing the value of their wages and minimizing the value of the put option on the firm's assets. The put option value decreases with the value of the firm's assets, and it increases with the volatility of the firm's operating cash flow. However, as argued by Faleye et al. (2006), given that employees' careers with the firm are finite, it is assumed that they have limited horizons and that they employ an infinite discount rate in the period beyond their careers. Under this assumption, employees' objective is to minimize the value of the put option.

3.3.3 Managers

Managers' claim differs from that of employees because assuming incentive compensation schemes, part of their compensation depends on the firm's value. Managers beside value invariant contractual wage receive some benefits dependent on the firm's value if the firm is solvent, while they receive or retain the firm's assets if the firm goes bankrupt because it is unable to pay the wages. The value of the managers' claim is something in between a fixed and residual claim.

In order to determine the value of the managers' claim $M(V)$, I proceed with general partial differential equation, which for claims that have no explicit time dependence can be simplified to an ordinary differential equation:

$$\frac{1}{2}\sigma^2 V^2 F_{VV}(V,t) + rVF_V(V,t) - rF(V,t) + C = 0.$$

The equation has the general solution:

$$F(V) = A_0 + A_1 V + A_2 V^{-X},$$

in which

$$X = \frac{2r}{\sigma^2},$$

and the constants A_0, A_1, and A_2 are determined by boundary conditions.

Managers receive a value invariant contractual wage (W) plus some benefits dependent on the firm's value (βV) if the firm is solvent. They receive or retain the firm's assets if the firm goes bankrupt because of being unable to pay wages. If V_B is the value of assets when bankruptcy is declared and a fraction of assets $0 \leq \alpha \leq 1$ is lost to bankruptcy costs, the boundary conditions are:

$$\text{at } V = V_B \qquad M(V) = (1 - \alpha)\, V_B$$

$$\text{at } V \to \infty \qquad D(V) = W / r + \beta V.$$

Using the second boundary condition, one can determine A_0 and A_1. Because $V^{-X} = 0$ as $V \to \infty$, $A_0 = W / r$ and $A_1 = \beta$. Using the first boundary condition, it is possible to determine that A_2. $A_2 = [(1 - \alpha - \beta)\, V_B - W / r\,]\, V_B^{X}$.

Thus the value of managers' claim is equal to:

$$M(V) = W/r + \beta V + \left[(1 - \alpha - \beta)V_B - W/r\right](V/V_B)^{-X},$$

which can also be written as:

$$M(V) = \left[1 - p_B\right](W/r + \beta V) + p_B\left[(1 - \alpha)V_B\right],$$

in which

$$p_B \equiv (V/V_B)^{-X}.$$

Similar to other stakeholders' claims, one can find that the value of the managers' claim is equal to payoff to managers when the firm is solvent and the expected recovery in bankruptcy weighted

by the probabilities of bankruptcy. Because managers also receive some benefits dependent on the firm's value when the firm is solvent in addition to a value invariant contractual wage, one can expect their claim to be something in between a fixed and residual claim. Something similar could be said for their objectives. However, because they have their reputation at stake when running firms, their objectives coincide more with those of the employees than those of the shareholders.

3.4 The firm's objective function

Acknowledging that other stakeholders besides shareholders can significantly affect the firm's behavior, and that stakeholders, such as employees and managers hold very different claims in the firm, one can express serious doubts about the shareholder value model. On the one hand, shareholders are substantially deprived of power within the firm, and on the other hand employees' and managers' claims and thus their objective functions differ from those of the shareholders. With other stakeholders besides shareholders in control, it can be expected that the firm's objective function will deviate from shareholder value maximization.

In contrast to a shareholder-oriented firm, a stakeholder-oriented firm put weights on these stakeholders' interests in the firm's objective function (Allen et al., 2007). If a firm goes bankrupt, for example, stakeholders face the costs of searching for new opportunities. On the other hand, if the firm survives, stakeholders earn rents from the relationship with the firm. These are the costs and benefits in addition to shareholders' interests that are weighted in a stakeholder-oriented firm's objective function. Based on the weight of different stakeholders' interests in its objective function, a stakeholder-oriented firm can take a wide range of forms, from ones that are more shareholder-oriented to ones favoring employees' or managers' interests.

The earliest literature distinguishes only the capital-managed firm, in which ultimate control is allocated in proportion to the supply of capital, and the labor-managed firm, in which ultimate control is allocated in proportion to the supply of labor. I consider the employee-governed firm and manager-governed firm, as well as a firm governed by a coalition of various stakeholders. If the firm is employee-governed, the firm is aimed at maximizing wages and minimizing the probability of bankruptcy. Because employees have a limited horizon, in comparison to those of the shareholders employees' objectives are more short-term oriented and, moreover, their objectives are characterized by higher risk aversion. Managers maximize utility stemming from wages and pecuniary and non-pecuniary benefits on the one hand, and the value of the firm on the other. For the former reason, in practice they end up maximizing revenues or growth of the firm. Because they have their reputation at stake when running firms, their objectives favor firm survival. If a shareholder-oriented firm seeks to maximize the value of the firm and thus shareholders' wealth, and an employee-governed and manager-governed firm are aimed at

maximizing wages or revenues and growth of the firm, a firm governed by a coalition of stakeholders ought to behave somewhere in between these extremes.

3.4.1 The employee-governed firm

In an employee-governed firm, the power is vested in employees and thus the firm's objective function coincides with the objectives of employees. In the previous section it was found that employees maximize the value of their wages and minimize the value of the put option on the firm's assets. The put option value decreases with the value of the firm's assets, and it increases with the volatility of the firm's operating cash flow. It could thus be argued that an employee-governed firm is aimed at maximizing wages and minimizing the probability of bankruptcy. Because of employees' limited horizon, in comparison to those of the shareholders employees' objectives are more short-term oriented and, moreover, their objectives are characterized by higher risk aversion.

One of the most important initial contributions analyzing employee-governed firms was made by Vanek (1970). Building on the seminal work of Ward (1958) and Domar (1966), he developed the theory of labor-managed economies. He investigated the system in which workers get together and form collectives or partnerships to run firms, hire capital and purchase other inputs, sell the products, bear the risk of any unexpected gain or loss, and distribute the resulting surplus among themselves. It is assumed that such a firm's goal is to maximize the income per worker. Meade (1972), who provided a concise review of his work, pointed out several differences that emerge from comparing a labor-managed economy with the capitalist model. The first is related to incentives. In an entrepreneurial firm, a hired worker observes the minimum standard of work and effort in order to keep his job, but he does not have any personal financial motive to behave in ways that promote the profitability of the firm. On the other hand, in a cooperative, an individual worker that shares in profits with his fellow workers receives some benefit due to his own additional effort, but only proportional to his share. It is expected that if the cooperative becomes large the financial incentive advantage that a cooperative has over an entrepreneurial firm disappears. However, even then it is believed that the sense of participation may provide greater social motivation to contribute in the firm's interests. The next difference relates to output adjustment to price changes. It was shown that both systems lead to the same long-run solution (assuming free entry and perfect competition); however, there are important differences in the short-run adjustment. The short-run effect of a price increase in a cooperative is a reduction, not an increase (as in an entrepreneurial firm) in the level of employment and output. A rise in the selling price raises both the value of the marginal product of labor and average earnings per worker that the cooperative maximizes. However, it raises the value of the marginal product of labor less than the average earnings per worker, meaning that the average earnings per worker can be further increased by decreasing the number of workers. Other differences relate to the

importance of free entry for the cooperative firm, the behavior of firms under monopolistic conditions, and the resulting macroeconomic effects.

Later on, Dreze (1976), who investigated the labor-managed economy using general equilibrium methodology, found that labor-management leads to the same general equilibrium as profit maximization. Moreover, he studied the choice of working conditions and investment decisions under uncertainty. He argued that, by choosing better working conditions, labor-management (or at least labor control over working conditions) could provide a remedy for the inefficient choice of working conditions implied by profit maximization. However, he admits that efficient risk bearing and efficient production under uncertainty will require more elaborate forms of participatory decision making. Miyazaki and Neary (1983) showed that, except in a range of very low output prices, in which the firm's revenues are low relative to fixed costs, the supply curve is upward sloping. Viewing the firm as a contract-based coalition of workers enabled them to include rational workers' concerns with income-employment risk in addition to the pecuniary rewards from current employment. In addition, they made a distinction between the short-run level of workers employed and the long-run size of coalition membership, which is fixed in the short run.

In contrast to the initial studies focusing on the behavior of labor-managed firms using an assumption about their objective function, Blinder (1993) formally derived the goal of an employee-governed firm. He showed that including employees' welfare in the firm's objective function leads the firm to maximize revenues rather than profits. Moreover, by maximizing revenues rather than profits the firm will employ more labor and produce beyond the profit-maximizing level, thus having an advantage when competing with a profit-maximizing firm, and driving rival profit-maximizing firms out of business. On the other hand, when it comes to hiring capital, a revenue-maximizing firm tends to behave as profit-maximizing firm. Katzner (2005) took a step further and provided a general model of firm behavior that allows for movement away from the postulates of rationality or maximization. Because forces that motivate people are determined by their cultural backgrounds, he argued that in places where self-interest is not a significant component of the cultural background the postulates of rationality have no place in explanations of a firm's behavior. As an alternative to a profit-maximizing firm, he considers the "Japanese firm," in which behavior tends to be driven by cultural values such as loyalty, the honoring of obligations, and harmony with society, rather than self-interest. He showed that the "Japanese firm" operates below the profit and utility-maximizing level and is thus not as efficient as its profit-maximizing counterpart. Moreover, the "Japanese firm" cannot achieve internal Pareto optimality. However, the absence of efficiency does not threaten the survival of the firm due to mitigating circumstances and offsetting effects.

Although it is clear that employees' objective function departs from value maximization, one has to take into account the fact that employees are not a homogeneous group with respect to their

preferences. Individual differences concerning their attitude to risk, their time horizons, and so on lead to different views on actions the firm should take. As argued by Furubotn (1976), the view that prevails depends on the outcome of the political process that is carried out within the firm. Assuming that a relatively homogeneous majority can be formed, it is this group that determines the objective function of the firm. Of course, these decision makers are concerned with the income a firm can produce; however, they also have an interest in control over the working environment and firm's internal political structure. As already argued by Vanek (1970), if the decision makers are rational and truly free to seek their own interests, it seems highly improbable that they will behave as suggested by simple wage maximization. For example, in the case of expansion, the decision makers estimate not only the physical productivity of any additional labor hired, but also the impact that this increment has on the working environment and the firm's internal political structure. It is often the case that a positive productivity effect is offset by the cost of losing political control, and thus control over the variables affecting their utility. Furubotn (1976) thus concludes that the original homogeneous majority that determines the firm's policies finds it desirable to limit the input of labor, and thus the capital, to levels below those suggested by marginal productivity consideration.

Empirical evidence confirms that the behavior of employee-governed firms deviates from profit maximization and the concept of shareholder value. Studying plywood cooperatives, Smith (1984) and Craig and Pencavel (1993) found that cooperatives give positive weights to employment and income per worker in their objective function. It has also been found that plywood cooperatives have virtually no short-term response of membership size to demand or cost shocks and output supply (Berman and Berman, 1989; Craig and Pencavel, 1995). Meanwhile, after reviewing studies on underinvestment effects, Bonin et al. (1993) concluded that there is less evidence that cooperatives tend to underinvestment. Mramor and Valentinčič (2001), studying the behavior of Slovenian privatized firms, which tend to be employee-governed, found that these firms had higher growth of wages than growth of productivity, decreased the value of the assets, were financed predominantly by equity, and paid very low dividends in the period studied.[28] They cite several reasons for such behavior, but point to culture as one of the most important ones. Finally, distinctive behavior also emerges from studies of firms in which employees have equity stakes. Faleye et al. (2006) found that firms in which labor has at least a 5 percent ownership stake deviate from value maximization, invest less in long-term assets, take fewer risks, grow more slowly, create fewer new jobs, and exhibit lower labor and total factor productivity. However, Bloom (1986) and Lougee (1999) found that employee ownership has little or no impact on productivity and that there is no evidence that it affects a firm's performance, whereas Beatty (1995) and Park and Song (1995) reported improvements in the first two and three years following the adoption of ESOP.

[28] One has to take into account that the period from 1995 to 1998 corresponds to the period after the dissolution of Yugoslavia and thus losing access to Yugoslav markets. Most firms thus ended up with excess capacity at that time.

3.4.2 The manager-governed firm

In a manager-governed firm the power is vested in managers. This is why it is expected that a firm's objective function coincides with the objectives of managers. In the previous section it was found that managers' claims are something in between a fixed and residual claim. Managers maximize wages on the one hand and, on the other hand, the value of the firm. However, because they have their reputation at stake when running firms, their objectives coincide with those of the employees rather than those of the shareholders. In addition, managers pursue their own interests and expropriate the wealth of the shareholders by allocating resources in favor of private interests. Managerial discretion in decision-making results from the separation of ownership and control and the lack of appropriate mechanisms that should align their interests with those of the shareholders.

The managerial theory of the firm dates back to Berle and Means (1932), who first pointed out the decreasing role of shareholders and a shift of power to managers. However, major developments emerged with managerial discretion models that challenge the traditional profit-maximization hypothesis and thus the concept of shareholder value; for example, the utility maximization model by Williamson (1963), the revenue maximization model by Baumol (1959, 1962), and the growth maximization model by Marris (1964), as well as the post-Keynesian theory (Gordon, 1994). Williamson's (1963) expense preference theory posits that managers maximize utility subject to minimum profit constraint rather than profit. Managers have a positive preference for expenditures on items such as staff expense, perquisites, and funds available for discretionary investments. When circumstances allow (i.e., when ownership is separate from control and goods and capital markets are imperfect), managers increase these expenditures beyond the levels justified by profit maximization. Baumol (1959, 1962) challenged the traditional profit-maximizing hypothesis by proposing revenue maximization. The manager tends to maximize his private benefits, which consist of pecuniary benefits (i.e., salary, bonuses, and rewards) and non-pecuniary benefits (i.e., luxury offices, private jets, and pet projects). If the pecuniary benefits are dependent on the firm's profits, the non-pecuniary benefits, because they are not consumed with the consent of the shareholders, increase with the revenues. It is thus no surprise that managers, as employees, tend to maximize revenues. Marris (1964) hypothesized that managers promote the growth rate of the firm, but are constrained by the minimum level of security. Most sources of managerial utility appear to be strongly correlated with the size of the firm. Managers thus have an incentive to grow faster and increase the size of the firm beyond the optimal size.

Theories that hypothesize that firms have goals other than profit maximization have been criticized mostly with regard to the long-run viability of the firm. Alchian (1950) argued that in the long run natural selection results in the survival of only firms that maximize profits. Friedman (1953) argued that, regardless of how actual firms may behave and regardless of the

constraints on their rationality, the surviving firms are those that earn the highest profits. Surviving firms thus act as if they maximize profit. In contrast, Vickers (1985) and Fershtman and Judd (1987) showed that, despite shareholders adhering to the profit-maximizing objective, they set non–profit-maximizing objectives for their managers. In a similar manner, but rather than distinguishing ownership and management, and distinguishing profit as an objective and profit as a result, Kaneda and Matsui (2003) showed that the firms that realize the highest profits are not generally those that have profit maximization in their objective function. They argued that once profit as an objective and profit as a result are distinguished, firms' profit maximization objectives cannot be justified using the "as if" logic proposed by Friedman (1953). Kaneda and Matsui (2003) argued that, although objectives other than profit maximization characterize firms' objective function, these objectives can still be consistent with the resultant profit guiding firm survival.

There is wide empirical evidence on managerial expropriation of shareholders' wealth, as well as alternatives to profit-maximization, mostly expense preference.[29] Having determined that wage and salary expenditures in banking increase with monopoly power, Edwards (1977) argued that the managerial objective function corresponds to expense-preference rather than profit-maximization. Hannan and Mavinga (1980) extended Edwards's model and used ownership data to test for the distinction in behavior between owner-controlled and manager-controlled firms. Consistent with expense-preference behavior, they found that manager-controlled banks operating in noncompetitive environments spend more on items that are preferred by managers. Verbrugge and Jahera (1981) found that mutual savings and loan associations exhibit greater tendencies toward expense-preference behavior (i.e., higher personnel expenditures) than stock associations. Akella and Greenbaum (1988) and Gropper and Hudson (2003) found additional support for expense-preference behavior by considering the impact on output rather than input usage. Only Smirlock and Marshall (1983) provided evidence inconsistent with expense-preference behavior. They argued that, for expense-preference behavior to exist, the effectiveness of the technology for conflict control between shareholders and managers must be related to market structure, which is a tenuous proposition. Moreover, once differences in monitoring costs due to variation in firm size are controlled for, the empirical evidence supports profit-maximizing behavior.

Arguments against value maximization have also been provided within post-Keynesian theory. Gordon (1994) argueed that a manager that has considerable freedom to subordinate shareholders' interests to his own interests does not hold a well-diversified portfolio of jobs and that bankruptcy is very costly to him, and so the manager ends up maximizing the firm's long-term survival. Assuming that under reasonable assumptions the investment decision of a portfolio investor can be reduced to the allocation of net worth between risk-free asset and a diversified

[29] See section 2.2 for a review of former studies.

portfolio of risky assets, he showed that the probability of long-term survival is maximized by making the fraction of the net worth invested in the risky assets vary with the excess in its mean rate of return over the risk-free rate, and vary inversely with the variance of its return and the net worth. Moreover, he suggests that the consumption/portfolio policy of a zero median growth rate in net worth provides a probability of only one-half of the long-term survival, and that there is no simple relation between an investor's probability of long-term survival and the fraction of the net worth in the risky assets. In particular, a high mean rate of growth is necessary for long-term survival and the probability of long-term survival is maximized by a fraction of net worth in risky asset being high or low, depending on the size of the net worth. The fraction of net worth in risky assets varies inversely with the net worth.

Adopting the logic of post-Keynesian theory to explain investment and the financial decisions of the firm, one can conclude the following. A firm maximizes the probability of long-term survival by increasing the amount of capital, by increasing the growth rate, and by decreasing the variability of the rate of return. Because the structure of the firm's investments is determined primarily by technology and not easily modified, the firm's financial risk and the rate of return is more easily controlled by its capital structure policy. However, a firm's capital structure choice is tightly connected to its investment policy. A firm invests in order to decrease the difference between the desired and actual amount of capital. The ratio of desired capital to equity capital depends on the autonomous ratio of desired capital to equity capital, the expected rate of return on capital, its variability, and the actual amount of equity capital. Investments are positively correlated with the expected rate of return on capital and negatively correlated with its variability and the amount of equity capital. A firm with a low level of equity capital (e.g., per employee) earns an insufficient return that does not guarantee long-term survival. Therefore, it has a high ratio of desired capital to actual equity capital, and thus invests heavily. Such a firm can increase the growth rate only with higher variability of the rate of return, and thus it is willing to accept riskier investment projects and a higher share of debt financing. Only when the amount of equity capital exceeds the amount that guarantees long-term survival does a firm reduce investing and adopt a more conservative capital structure policy. At this level of equity capital, the risk of going bankrupt is lower at a lower share of debt financing.

3.4.3 The firm governed by a coalition of various stakeholders

The firm consists of various stakeholders. In the previous chapter it was shown that if stakeholders other than shareholders receive only an exogenously determined wage, the firm behavior is characterized by the concept of shareholder value. On the other hand, if the firm's rent is under employees' or managers' control, its behavior corresponds to the behavior of an employee-governed firm or manager-governed firm, respectively. Whereas shareholder-oriented firms seek to maximize the value of the firm and thus shareholders' wealth, and employee-

governed and manager-governed firm is aimed at maximizing wages or revenues and favor firm's survival, a firm governed by a coalition of stakeholders ought to behave somewhere in between these extremes. There are infinitely many ways of distributing the firm's rent among the stakeholders.

Simon (1952) was the first to posit an alternative theory of the firm, or more generally a theory of the organization, in which, in contrast to the passive role of stakeholders other than shareholders (i.e., employees, customers and suppliers), they are treated in a more symmetrical fashion. Stakeholders participate in the organization if the utility derived from the difference between the rewards and the contributions is greater than the utility obtained if withdrawing from the relationship. The participants thus make an all-or-nothing decision on participation or non-participation. In contrast to the traditional theory of the firm, Simon's alternative theory is not concerned so much with optimality but with the conditions necessary for the firm's survival; that is, the conditions under which the participant will continue to participate. Of course, the survival criterion does not yield a unique solution to the values of the contributions and reward for each participant.

Aoki (1980) modeled the firm as a shareholder-employee cooperative game. Employees in cooperation with physical assets supplied by shareholders produce some economic gains. The organizational rent is then distributed to employees and shareholders through a bargaining process. There is a clear conflict over the division; in addition, the conflict also extends to the amount of the organizational rent to be produced (i.e., the sales price and the growth rate). In addition to the process being considered as a model of collective bargaining, one can also describe it as managerial calculation designed to bring stability to the organization. The manager changes the internal distribution in the direction of increasing the weighted sum of the rent earned by employees and shareholders, weighted by the bargaining power of each stakeholder. The bargaining power of each stakeholder is defined in terms of external opportunities outside the firm and its attitude toward risk. In Aoki (1983) the model extends to include other stakeholders, such as banks and business partners.

Allen et al. (2007) developed a model of stakeholder governance in the context of an imperfectly competitive product market in which the firms are concerned with their continuity. They modeled stakeholder governance as firms putting weights in their objective function on the effects of bankruptcy on stakeholders other than shareholders. If a firm goes bankrupt, for example, stakeholders face the costs of searching for new opportunities. On the other hand, if the firm survives, stakeholders earn rents from their relationship with the firm. These are the costs and benefits in addition to shareholders' interests that are weighted in a stakeholder-oriented firm's objective function. They showed that concerns for stakeholders other than shareholders lead to softening competition because firms tend to charge higher prices and produce lower output. Moreover, they showed that stakeholder-oriented firms have higher firm value, and thus a

concern for the stakeholder to benefit shareholders. Therefore, it can be expected that shareholders may actually want to put in place governance structures that commit them to adopting a concern for other stakeholders.

* *

Modern capital structure theory assumes that firms are governed by shareholders and seeks to maximize the value of the firm and thus shareholders' wealth. However, just a glance at corporate governance systems around the world suggests that there are stakeholders other than shareholders that significantly affect firms' behavior. In Germany, for example, the legal system is quite explicit that firms do not have the sole duty of pursuing the shareholders' interests. A system of codetermination enables employees' active participation in the firm's decision-making process. Germany is by no means the only country where one can expect deviation of the firms' behavior from the concept of value maximization. I provided evidence of distinctive corporate governance systems in Japan, France, Italy, Sweden, European transition countries, and the US.

Here, then, is the new theory of the firm that identifies alternative sources of power within the firm. According to the property rights theory, power stems from ownership of physical assets. Hence, the firm is nothing but a collection of physical assets (Grossman and Hart, 1986). It is thus no surprise that there is no room for stakeholders other than shareholders in the existing theory of the firm given that people cannot be owned. Of course, ownership of physical assets is not the only source of power within the firm. Rajan and Zingales (1998), for example, argue that power stems from control over a critical resource and that the main mechanism to allocate power is access; that is, the ability to use or work with the critical resource. The agent that is given privileged access to the resource receives no residual rights of control except for the opportunity to specialize his human capital to the resource and make himself valuable. Highlighting alternative sources of power, the new theory of the firm defines the firm in terms of unique assets, as well as in terms of people that have access to the critical resources or have information. Moreover, it brings stakeholders other than shareholders within the boundaries of the firm. In contrast to the property rights theory, the new theory of the firm considers managers, as well as employees, to be an important part of the firm.

Using the option pricing theory developed by Black and Scholes (1973) and Merton (1973, 1974), I derived the claims of various stakeholders. Investigating their claims, I defined their objective functions. It is my hypothesis that employees' and managers' objectives deviate from shareholder value maximization and are, in addition to being aimed at maximizing their benefits instead of shareholder value, characterized by greater risk aversion compared to those of the shareholders.

This eventually makes it possible to hypothesize about the goal of the stakeholder-oriented firm. Depending on the weight of each stakeholders' interest in the firm's objective function, a stakeholder-oriented firm can take a wide range of forms, from ones that are more shareholder-oriented to ones that put employees' and or managers' interest in first place. Of course, each of these has a distinctive objective function. If the firm is employee-governed, I argue that the firm is aimed at maximizing wages and minimizing the probability of bankruptcy. Because of employees' limited horizon, in comparison to those of the shareholders employees' objectives are more short-term oriented and, moreover, their objectives are characterized by higher risk aversion. Managers seek to maximize utility stemming from wages and pecuniary and non-pecuniary benefits, and only then the value of the firm that affects their compensation. However, in practice they end up maximizing revenues or growth of the firm. Because they have their reputation at stake when running firms, their objectives favor firm survival. This corresponds to maximizing the revenues and the growth of the firm. A firm governed by a coalition of stakeholders should behave somewhere in between the goals of shareholders, employees and managers.

Proceeding from the objective functions of employee-governed and manager-governed firms, I now investigate the capital structure implications of having employees and managers in control and then provide evidence of the capital structure implications of having employees in control by conducting an empirical study.

4 The theory of capital structure in employee-governed and manager-governed firm

Hypothesizing about the objective function of a stakeholder-oriented firm, I now investigate the resulting capital structure implications. In the following chapter, I restrict my research to employee-governed firm and manager-governed firm. I argue that firms that take employees' and managers' interests into account and thus have a specific objective functions operate with lower leverage compared to value-maximizing firms governed by shareholders. In addition, there are other channels through which capital structure decisions are affected in these firms. Lower leverage in these firms results from a limited supply of debt, as well as lower demand for debt, while alternative capital structure determinants correspond to the specific objective functions of these firms.

Limited supply of debt to employee-governed and manager-governed firms results from adverse selection and the moral hazard problem, which affect these firms' borrowing capacity more severely than the borrowing capacity of firms governed by shareholders. Moreover, employee-governed and manager-governed firms are constrained when signaling their creditworthiness to mitigate adverse selection and the moral hazard problem.

Employee-governed and manager-governed firms have a specific objective functions, as well as being more risk averse. As found in the previous chapter, employees tend to maximize wages, whereas the objectives of managers tend to be somewhere in between maximizing the utility stemming from wages and pecuniary and non-pecuniary benefits, and the value of the firm that affects their compensation. Higher risk aversion in employee-governed and manager-governed firms stems from the fact that employees' and managers' most important part of the claim in the firm do not come from diversified financial investments, but undiversified human capital investment. It is no surprise that these firms tend to opt for lower leverage compared to value-maximizing firms to decrease the bankruptcy risk, as well as be driven by different forces when choosing their capital structures.

4.1 Supply of debt

Credit market equilibrium is characterized by credit rationing. Credit rationing refers to the equilibrium phenomenon when a potential borrower cannot obtain a loan that he wants even though he is willing to pay the interest rate that the lender requires or perhaps even offers to pay a higher interest rate. Normally, if demand exceeds supply, the price will rise, decreasing demand and/or increasing supply, until demand and supply are equal. However, it seems that the interest

rate does not do its job on the credit market. Why are lenders not willing to raise interest rates if demand exceeds supply at the prevailing rates? One possible explanation is that interest rate ceiling regulations prevent such adjustment toward market equilibrium. However, economists following the impetus of Jaffe and Russell (1976), Keeton (1979), and Stiglitz and Weiss (1981, 1983) have come to conclusion that credit rationing is driven by the asymmetry of information between borrowers and lenders. It was shown that because of adverse selection and the moral hazard problem, some borrowers are unable to obtain credit, whereas the borrowers that do obtain credit face limited borrowing capacity.

Adverse selection occurs because lenders and borrowers have asymmetric information about the quality of the borrowers. When lenders cannot separate good borrowers (i.e., borrowers that have a high probability of repayment) from bad borrowers (i.e., borrowers with a low probability of repayment), bad borrowers are more likely to be selected than good borrowers. Higher interest rate tend to attract bad borrowers because good borrowers are willing to pay only a low interest rate and are thus driven out of the market. Lenders therefore want to keep interest rates low in order to attract good borrowers. As a result, some of the borrowers that want credit cannot obtain it. Moral hazard refers to the problem of inducing the borrower to behave as desired by the lender when the borrower's actions cannot be observed and contracted for. Because of the interest rate's incentive effects, the behavior of the borrower is likely to change with the increase in the interest rate. A higher interest rate decreases the borrower's return on projects that succeed and thus induces them to undertake riskier projects (i.e., projects with a lower probability of success but higher payoff, or projects that offer borrowers higher private benefits). For this reason, some borrowers are unable to obtain credit, whereas the borrowers that do obtain credit face limited borrowing capacity.

Firms mitigate the adverse selection problem and credit rationing by signaling the true quality to uninformed lenders, so that they invest their own funds in projects, pledge collateral, borrow short-term, and choose an appropriate payout policy. Moral hazard and the firm's borrowing capacity are increased by pledging real assets as collateral, reputation capital, and diversification, as well as bringing down the bargaining power of human capital. Because the problem of credit rationing and limited borrowing capacity is more severe in employee-governed and manager-governed firms compared to the problem in firms governed by shareholders, these firms are faced with a lower supply of debt. The relationship between the lender and employees and managers controlling these firms is characterized by higher information asymmetry and higher agency costs. Moreover, because of limited personal wealth and risk aversion, employee-governed and manager-governed firms are deprived of using some signals and thus cannot mitigate lenders' informational disadvantage, which is crucial for reducing credit rationing. Limited personal wealth and risk aversion, as well as the bargaining power of human capital, also enables them to control moral hazard and increase their borrowing capacity.

4.1.1 Adverse selection and credit rationing

Credit rationing results from adverse selection and the moral hazard problem. Let us start the discussion with the implications of adverse selection and leave out the moral hazard problem for this section. Treating adverse selection and the moral hazard problem together is not necessary because adverse selection alone creates an agency cost and resulting credit rationing. The discussion builds on the privately-known prospectus model (Tirole, 2006). Although this model is very simple compared to the credit-rationing model developed by Jaffe and Russell (1976), Keeton (1979), and Stiglitz and Weiss (1981, 1983), it provides the key implications of adverse selection. Moreover, it makes it possible to restrict the analysis to the adverse selection problem.

Assume that we have an entrepreneur that has a project. The project requires an investment I, but the entrepreneur has no funds to finance the project, $A = 0$. To implement the project, the entrepreneur has to borrow an amount equal to I. The project either succeeds and yields income R, or fails and yields no income. The borrower and the lenders are risk neutral, and the borrower is protected by limited liability. The borrower can be one of two types: a good borrower that has probability of success p, or a bad borrower that has probability of success $q < p$. Lenders do not have information about the type of the borrower, and the credit market assigns probability α to the good borrower and $1 - \alpha$ to the bad borrower. Lenders' prior probability of success is:

$$m \equiv \alpha p + (1-\alpha)q .$$

Under symmetric information, the good borrower obtains financing because he is creditworthy, $pR > I$. The entrepreneur secures the highest level of compensation R_b^G in the case of success, which is consistent with the lender's break-even condition:

$$p\left(R - R_b^G\right) = I .$$

The bad borrower receives funding only if he is creditworthy, $qR > I$. He receives compensation R_b^B. If the bad borrower is not creditworthy, $qR < I$, he is not funded.

The asymmetric outcome is different because the bad borrower can imitate the good borrower and earn more than he would obtain by revealing his true type. Assume that the only feasible contract gives the borrower compensation $R_b \geq 0$ in the case of success and 0 in the case of failure. The lenders' return is thus equal to:

$$\left[\alpha p + (1-\alpha)q\right]\left(R - R_b\right) - I = m\left(R - R_b\right) - I .$$

If the bad borrower is not creditworthy, or the probability that the borrower is a bad borrower is large enough, $\alpha < \alpha^*$, then $mR < I$. Because the borrower cannot receive negative compensation, lenders lose money if they decide to lend. Being aware of this, lenders do not lend and the credit market breaks down.

On the other hand, if both types of borrowers are creditworthy or the bad borrower is not creditworthy but $\alpha \geq \alpha^*$, then $mR \geq I$. In this case, lenders make money on good borrowers and lose on bad borrowers. There is cross-subsidization and the good borrowers are still hurt by the presence of bad borrowers – however, to a lesser extent than if the market breaks down.

Therefore, in practice good borrowers are prone to signal their true type to uninformed lenders in order to obtain financing. One way to convey information to lenders is to invest one's own funds in the project. Other ways include collateral pledging, borrowing short-term instead of long-term, choosing an appropriate payout policy, and so on. However, as will be argued in the following, compared to firms governed by shareholders, employee-governed and manager-governed firms are often deprived of the use of these signals and thus cannot mitigate lenders' informational disadvantage, which is crucial for reducing credit rationing. Moreover, these firms are characterized by higher information asymmetry. Therefore, these firms are seriously affected by credit rationing and thus faced with a lower supply of debt compared to the firms governed by shareholders.

Leland and Pyle (1977) argued that the willingness of a person with inside information to invest his own funds in the project, which is observable because of disclosure rules, serves as a signal to lenders about his confidence in the project's profitability. Investing one's own funds in the project is a costly signal because for bad borrowers it does not pay off to invest in their low-quality projects. Bad borrowers thus do not mimic good borrowers investing their own funds in projects. In this way, lenders can separate good borrowers from bad ones.

However, signaling by investing one's own funds requires insiders (i.e., employees and managers) to have funds available, as well as to forgo the benefits of diversification. Employees have limited personal wealth. Moreover, compared to shareholders, employees are more risk averse and thus prefer to hold a low-risk diversified portfolio rather than invest their wealth in the firm where they are employed. Finally, they have already invested their human capital in the firm. Bowles and Gintis (1996) estimated that the average net worth per employee computed using the least wealthy 80 percent of families in the US in 1988 was roughly equal to half the value of the capital stock per employee. However, they found that about half of the net worth was invested in homes and cars. Besides, one has to take into account that, by investing in the firms where they are employed, employees forgo the benefits of diversification. Bonin et al. (1993), surveying theoretical contribution, as well as empirical evidence concerning producer cooperatives, argued that inability of members to diversify their portfolio is one of the main

reasons for the rarity of employees' control. In contrast to employees, managers are to a lesser extent constrained by their personal wealth, but as employees they are risk averse and prefer to hold a diversified portfolio. As showed by Beck and Zorn (1982), it is managers' risk aversion that deters a manager from being a 100 percent owner and a manager's ownership share emerges as a portfolio choice problem and is not relied upon as a budget constraint.

The creditworthiness of the borrower can be signaled by pledging collateral. Chan and Kanatas (1985) showed that collateral pledging allows loan contracting when lenders and borrowers have different valuations of their payoffs. They argued that, when different valuations result from information asymmetry, collateral serves as a signaling device whereas, when different valuation emerges when lenders and borrowers possess the same information but divergent opinions or beliefs, collateral functions as an observable variable upon whose value lenders and borrowers can agree and base the loan contract. They showed that there is a positive relation between the amount of collateral offered and creditworthiness of the borrower, and that the collateral will be offered by the borrower when the lender has a lower valuation, the amount being dependent on the size of transaction costs associated with the use of collateral.[30] Bester (1985) argued that if banks compete simultaneously, rather that separately, choosing the collateral and interest rate to screen borrowers' risk, low-risk borrowers choose contracts with a low interest rate and high collateral requirements, and high-risk borrowers choose contracts with a high interest rate and low collateral requirements. No credit rationing will occur as long as an increase in collateral can be used to improve sorting the borrowers; however, as shown by Bester (1987), credit rationing persists because the use of collateral is severely restricted by borrowers' initial wealth. Evidence that there will be credit rationing when borrowers' collateral constraints are binding was also provided by Besanko and Thakor (1987).

Again, signaling by pledging collateral is limited in employee-governed and manager-governed firms. These firms are characterized by higher information asymmetry, meaning that these firms are required to pledge more collateral compared to firms governed by shareholders that are characterized by lower information asymmetry. Employee-governed firms are also constrained by the amount of assets that can be used as collateral. Because of limited personal wealth, as well as employees' risk aversion, and the resulting difficulties in raising capital, it is uncommon to observe employee-governed firms operating in capital-intense industries and in industries with large economies of scale in which capital requirements are large. Instead, these firms emerge mainly in labor-intense production. Labor-intense production means that the firms use relatively more labor inputs compared to capital inputs and often employ firm-specific assets, and thus have fewer collateralable assets available. Williamson (1988) argued that debt is appropriate to

[30] One has to be aware that the presence of moral hazard requires a bad borrower to pledge more collateral than a good one. The correlation between the type of borrower thus depends on the source of agency cost (i.e., adverse selection or moral hazard). Empirical evidence supports the view that good borrowers pledge less collateral (see Berger and Udell, 1992; Booth, 1992).

finance a project employing assets that are not specific to the firm and can be redeployed elsewhere, whereas projects with firm-specific assets tend to be financed with equity. There is also evidence that labor-managed firms choose lower capital-labor ratios than capitalist rivals (George, 1993; Batstone, 1982; Berman and Berman, 1989). Similar arguments can be made for manager-governed firms.

Borrowers signal their creditworthiness also by borrowing short-term instead of long-term and securing fewer resources than needed in the future. By borrowing short-term, a good borrower conveys to uninformed lenders that he is confident about his prospects and he is not afraid of refinancing short-term debt. This hypothesis builds on Flannery (1986), who investigated the effects of asymmetric information on debt maturity choice, and Diamond (1991), who analyzed a debt maturity choice as a trade-off between a borrower's preference for short-term debt due to private information about a future credit rating and liquidity risk, which relates to the risk that a solvent but illiquid borrower could be unable to obtain refinancing and thus be liquidated. Financing with debt of shorter maturity than cash flow from investments gives substantial control to the lender because the borrower must refinance the debt, and the borrower can pay off the debt only by obtaining new credit. If lenders estimate that debt will not be paid off eventually, they may not refinance and, if the debt is not repaid, they can liquidate the firm. If there are no limits to assign future cash to debt repayment (i.e., there is no liquidity risk), short-term debt is preferred by the borrower whose private information is favorable. This is a signal of good prospects. However, when it is impossible to assign future cash to debt repayment, debt maturity choice is made by trading off the information effect and liquidity risk. It follows that firms with higher credit ratings prefer short-term debt, whereas those with a lower rating prefer to choose long-term debt. The firms with the lowest rating have no choice but to use short-term debt.

When signaling by borrowing short-term, it appears that employee-governed and manager-governed firms are not constrained, as found for other ways of signaling. Because they are aware of higher information asymmetry and limited abilities to use other ways of signaling, it is expected that these firms will use signaling by borrowing short-term to a higher extent than firms governed by shareholders. However, employee-governed firms emerge mainly in labor-intense production, in which liquidity risk is high. In addition, compared to shareholders, employees and managers are more risk averse, and so it is expected that these firms will finance their activities using long-term sources. In addition, as argued in the next section, employees and managers are risk averse and have a specific objective functions, and so they use debt financing less aggressively than firms governed by shareholders. Because of these opposite effects, it is difficult to determine the use of short-term borrowing to mitigate the adverse selection problem and credit rationing in employee-governed and manager-governed firms.

Finally, a payout decision is a costly signal because a dividend payout raises financing costs and brings about suboptimal investment. In addition, dividends are not the cheapest way of

distributing profits because of taxation. Thus, good borrowers can use a payout decision as a signal about their future earnings because bad borrowers do not imitate them, as for example, imitate them when informing the investors by earnings announcements. The information content of dividends was introduced by Miller and Modigliani (1961), and Bhattacharya (1979), Miller and Rock (1985), and John and Williams (1985) started to formalize the idea. Bernheim and Wantz (1985) provided empirical evidence that dividends are motivated by signaling concerns rather than a disposal of free cash flows, and Aharony and Swary (1980) showed that announcements of dividend increase or decrease result in positive or negative abnormal returns, respectively. However, there is weak empirical evidence supporting a positive relationship between changes in dividends and changes in earnings (see, e.g., Watts, 1973; Healy and Palepu, 1988; Benartzi et al., 1997; Nissim and Ziv, 2001).

Signaling using payout policy is again limited in employee-governed and manager-governed firms. Compared to shareholders, for employees (whose claims in the firms consist mostly of wages) dividend payouts are more expensive because higher dividends mean lower wages and benefits. Employees' equity claims are usually small compared to claims associated with wages. The same is true for managers; however, managers can be larger shareholders and find dividends as a substitute for their wage and benefits. Finally, compared to shareholders, employees and managers are more risk averse and are thus often do not prefer large payouts if such a policy can threaten the firm's survival.

4.1.2 Moral hazard and credit rationing and firms' borrowing capacity

The other source of credit rationing is moral hazard. Let us start the discussion using the fixed-investment model of Holmstrom and Tirole (1997). Assume that we have an entrepreneur that has a project. The project requires a fixed investment I, but the entrepreneur has assets (cash or net worth) $A < I$. To implement the project, the entrepreneur has to borrow $I - A$. The project either succeeds and yields a verifiable income $R > 0$, or fails and yields no income. Denote the probability of success with p. The project is subject to moral hazard, meaning that the entrepreneur can behave in the way desired by the lender or misbehave and shrink and enjoy private benefits B. Behaving in a desired way is associated with probability of success $p = p_H$ and no private benefits to the entrepreneur, whereas misbehaving yields probability of success $p = p_L < p_H$ and private benefits $B > 0$. For simplicity, it is assumed that both the entrepreneur and the lender are risk neutral and they have no time preference. Lenders behave competitively and earn no profit on the loan.

A loan contract specifies how much each side invests and how the profit is shared. An optimal contract will be defined as follows: the entrepreneur invests all his funds, A, and the lender

invests the rest, $I - A$; neither party is paid anything if the project fails, and if the project succeeds the two parties share profit R, with the lender receiving R_l and the entrepreneur R_b. Assume that the project is viable only if there is no moral hazard. If the entrepreneur behaves in a desired way, the project has positive NPV:

$$p_H R - I > 0\,,$$

but negative NPV if he misbehaves, even if his private benefits are included:

$$p_L R - I + B < 0\,.$$

Because the NPV of the project is negative in the case of misbehavior, the loan contract must specify enough of the payoff for the entrepreneur to induce him to behave:

$$p_H R_b \geq p_L R_b + B \text{ or}$$

$$R_b \geq \frac{B}{\Delta p}\,.$$

From this incentive compatibility constraint, one can infer the highest possible pledgeable income:

$$R_l = p_H\left(R - \frac{B}{\Delta p}\right).$$

Because the lender must break even in order to be willing to finance the project, the pledgeable income must exceed the lender's loan. The lender's individual rationality constraint is equal to:

$$R_l = p_H\left(R - \frac{B}{\Delta p}\right) \geq I - A\,.$$

Based on the necessary condition for financing:

$$A \geq \overline{A} = I - \frac{p_H}{R - \frac{B}{\Delta p}}\,,$$

it can be concluded that only borrowers that have enough assets will be financed. Notice that, even though the project has positive NPV, if $A < \overline{A}$ the project will not be financed. An entrepreneur with insufficient assets must borrow a large amount and therefore pledge a large fraction of the return in the case of success, keeping only a small fraction of the gain and thus being demotivated. The parties cannot find a loan contract that would induce the entrepreneur's effort and allow the lender to recoup the investment. This is why there is credit rationing. Agency costs thus make firms credit-constrained. Agency costs are measured by the combination of private benefits B the entrepreneur can enjoy by misbehaving and the extent to which the verifiable performance reveals such misbehavior, which is defined as the likelihood ratio $\Delta p / p_H$ or (p_H / p_L).

I now move to the Holmstrom and Tirole (1997) continuous-investment model, but follow Tirole (2006), who simplified the analysis, to show how moral hazard affects a firm's borrowing capacity. In contrast to the fixed-investment model, which assumes decreasing returns beyond some investment level, assume now that there are constant returns to scale. The investment $I \in [0, \infty]$ yields income that is proportional to the level of investment, RI, in the case of success and 0 in the case of failure. As before, the entrepreneur has assets $A < I$, and therefore he has to borrow $I - A$ to finance a project of size I. As in the fixed-investment model, entrepreneur behavior is subjected to moral hazard, meaning the entrepreneur can behave in a way desired by the lender or misbehave and shrink and enjoy private benefits, which are proportional to investment, BI. Behaving in a desired way is associated with probability of success $p = p_H$ and no private benefits to the entrepreneur, whereas misbehaving yields probability of success $p = p_L < p_H$ and private benefits $BI > 0$.

As before, a loan contract specifies that both parties receive nothing in the case of failure, and RI is shared among them in the case of success; the lender receives R_l and the entrepreneur receives R_b.

Proceeding as with the fixed-investment model, the incentive compatibility and lender's individual rationality constraints are:

$$R_b \geq \frac{BI}{\Delta p} \text{ and}$$

$$R_l = p_H (RI - R_b) \geq I - A.$$

In equilibrium, competitive lenders make no profit. The net utility of the entrepreneur borrowing the funds is thus equal to the social surplus resulting from the investment. This is why it is optimal for the entrepreneur to invest as much as possible, or until leverage hits the firm's borrowing capacity. The firm's borrowing capacity is determined by incentive compatibility and the lender's individual rationality constraints. Substituting the former into the latter, one obtains:

$$I = kA,$$

in which

$$k = \frac{1}{1 - p_H\left(R - B/\Delta p\right)} > 1$$

is the equity multiplier, which shows how the entrepreneur can lever his wealth.

For the entrepreneur it is optimal to invest k times his cash, A, because the entrepreneur's utility is equal to the social surplus brought about by the investment:

$$U_b = \left(p_H R - 1\right)I .$$

Investing k times his cash, A, requires borrowing $d = k - 1$ times his cash, A, in which:

$$d = \frac{p_H\left(R - \dfrac{B}{\Delta p}\right)}{1 - p_H\left(R - \dfrac{B}{\Delta p}\right)}.$$

dA is thus the firm's borrowing capacity. As for credit rationing, the firm's borrowing capacity is, in addition to assets in place, determined by agency costs, measured by the combination of private benefits B the entrepreneur can enjoy by misbehaving and the extent to which the verifiable performance reveals such misbehavior, which is defined by the likelihood ratio $\Delta p / p_H$ or (p_H / p_L).

One can conclude that because of moral hazard that results in agency costs, lenders can only be offered a part of the return. The return offered is often too small and too risky, making the lenders reluctant to finance the projects. In order to obtain financing, on the one hand firms sacrifice value to increase the pledgeable income, and, on the other hand, lower the risk associated with expected return. The moral hazard problem and agency costs are mitigated and thus the firm's borrowing capacity is increased by pledging real assets as collateral, reputation capital, and diversification. On the other hand, the firm's ability to borrow is restrained because

of the inalienability of human capital. Because employee-governed and manager-governed firms are characterized by higher agency cost, it can be concluded that these firms' borrowing capacity is constrained to a greater extent than firms governed by shareholders. Moreover, employee-governed and manager-governed firms are constrained in reducing moral hazard and thus boosting the ability to borrow.

Pledging real assets as collateral is not used just as a signaling device, but operates as an important incentive mechanism as well. In contrast to the initial findings provided by Stiglitz and Weiss (1981), who argued that pledging collateral cannot solve the moral hazard problem and thus credit rationing because increasing requirements induce investors to undertake riskier projects, Bester (1987) showed that increasing collateral requirements has a positive incentive effect. Higher collateral makes projects less attractive for borrowers that are more likely to fail and thus increases the probability of repayment. Credit rationing will thus occur only if borrowers cannot provide enough collateral.

As found in the previous section, pledging real assets as collateral has some limitations in employee-governed and manager-governed firms. These firms are characterized by higher agency costs, meaning that these firms are required to pledge more collateral than firms governed by shareholders, which are characterized by lower agency costs, in order to boost the ability to borrow. Employee-governed firms are also constrained by the amount of assets that can be used as collateral because these firms mainly emerge in labor-intense production in which less collateralable assets are available. Williamson (1988) argued that debt is appropriate to finance projects employing assets that are not specific to the firm and can be redeployed elsewhere, whereas projects with firm-specific assets tend to be financed with equity.

Firms can also reduce moral hazard by pledging intangible assets, such as reputation. Diamond (1989), following Kreps and Wilson (1982) and Milgrom and Roberts (1982), who argued that reputation arises from learning about the agent's behavior over time, showed that if there is a widespread adverse selection then the initial borrowers will be of low quality and the interest rates will be high, and thus the borrowers will be undertaking risky projects. Because a fraction of the borrowers will succeed and repay the loan, and thus receive a good reputation, the interest rates will fall for good-quality borrowers, increasing the value of rents in the future from good reputation. Eventually, when these rents become high enough, good borrowers switch to long-run optimum, low-risk high-value projects. In contrast to other ways of boosting the ability to borrow, it is expected that employee-governed and manager-governed firms will be more inclined to build reputation capital than firms governed by shareholders. Reputation capital is often the only collateral that they can pledge.

Firms can also cross-pledge incomes of various projects, meaning that they can use the income received on a successful project as collateral for other projects. Diamond (1984) argued that

diversification resolves the moral hazard problem by providing substantial incentive benefits when projects are independent. However, in practice there are limits to diversification. In practice, project returns are often correlated, firms have core business competency, which makes diversifying outside it inefficient, and, last but not least, firms can only handle a limited number of projects. Diversification and cross-pledging also have similar limitations in employee-governed and manager-governed firms.

Finally, a firm's borrowing capacity is severely restrained because of the inalienability of human capital. Hart and Moore (1994) argued that ex ante division of the project return between the entrepreneur and the lender may not be enforceable and may be subject to renegotiation if the entrepreneur can threaten not to complete the project by withdrawing his human capital and he cannot be costlessly replaced. The lender reacts to the entrepreneur's blackmailing by refusing to finance some profitable projects.

Because the severity of the problem of inalienability of human capital increases with borrower bargaining power, it is expected that the borrowing capacity of employee-governed and manager-governed firms will be restrained to a higher extent than the borrowing capacity of firms governed by shareholders. Compared to firms governed by shareholders, employee-governed and manager-governed firms are characterized by the higher bargaining power of human capital.

4.2 Demand for debt

In addition to the limited supply of debt to employee-governed and manager-governed firms, these firms also have lower demand for debt than firms governed by shareholders. Capital structure decisions are made by managers; however, modern capital structure theory assumes that managers make capital structure decisions so as to maximize the value of the firm and thus shareholders' wealth. In contrast to firms governed by shareholders, employee-governed and manager-governed firms take employees' and managers' interests into account when deciding on capital structure.

Employees and managers have specific objective functions and are more risk averse. As found in the previous chapter, employees tend to maximize wages, whereas the objectives of managers tend to be somewhere in between maximizing the utility stemming from wages and pecuniary and non-pecuniary benefits, and the value of the firm that affects their compensation. Higher risk aversion in employee-governed and manager-governed firms stems from the fact that employees' and managers' most important part of the claim in the firm do not come from diversified financial investments, but from undiversified human capital investment.

4.2.1 The specific objective function and demand for debt

There is a scarce literature available on capital structure choice in employee-governed and manager-governed firms recognizing their specific objective functions; moreover, much of this literature, despite recognizing their objectives, does not avoid the main assumption of modern capital structure theory about the stakeholder in control and the goal of the firm. It is assumed that firms are governed by shareholders and that capital structure decisions are made so as to maximize the value of the firm and thus shareholders' wealth. Debt in this setting serves as a disciplining mechanism to reduce inefficiencies that result from employees or managers pursuing their own utility rather than maximizing shareholders' wealth. The literature rarely assumes that the behavior of the firm can be affected by the behavior of other stakeholders, or can be governed by employees or managers that have a specific objective function, and analyzes the resulting capital structure implications. The literature's main findings suggest that these firms have lower demand for debt and that there are other channels through which capital structure decisions are affected.

Let us start the discussion with the demand for debt in a manager-governed firm because, in contrast to an employee-governed firm, a relatively wider body of research is available. This will introduce the main concepts and help in hypothesizing about the demand for debt in an employee-governed firm, for which even fewer contributions exist. As discussed in the second chapter, the agency costs theory (Jensen and Meckling, 1976; Jensen, 1986; Grossman and Hart, 1982; Myers, 1977), as well as models focusing on costly intervention (Stulz, 1990; Hart and Moore, 1995; Berglof and von Thadden, 1994; Dewatripont and Tirole, 1994), emphasize the role played by debt in reducing agency conflicts between managers and shareholders. It is argued that debt increases efficiency because it prevents managers from pursuing their own interests and forces them to take action to maximize shareholders' wealth, solve collective action problems, and change incentives. The problem is that the agency cost theory assumes that, although managerial behavior is subject to agency problems, shareholders force managers to make capital structure decisions so as to maximize the value of the firm and thus their wealth. The question is why managers, if they have capital structure decisions under their control, would use debt to decrease their own discretion.

This question has been addressed by managerial literature on capital structure choice. Focusing on managerial control motivations, Haris and Raviv (1988) and Stulz (1988) argued that managers use debt to increase their voting power, and Israel (1991) to affect the distribution of cash flows between voting and nonvoting shares in order to influence the outcome of the takeover contest. Zwiebel (1996) argued that managers, trading off their empire-building ambitions and their needs to ensure sufficient efficiency to prevent control challenges, use debt as a credible signal to constrain their future empire building. He argued that in contrast to the agency cost theory, in which the discipliner is imposed ex ante, managers voluntarily choose

debt, using potential bankruptcy as a means to credibly commit to foregoing bad investments because of the constant presence of a potential discipliner. The managerial restraint stems from the potential loss of control that results from bankruptcy rather than a lack of free cash flow necessary to undertake investments.

Novaes (2003) compared the value-maximizing capital structure choice proposed by the agency costs theory with the one proposed by managerial literature and demonstrated that the takeover threat cannot reconcile both theories. He argued that managers under a takeover threat will choose the value-maximizing debt level only if the takeover cost is at a particular level and any deviation implies underleverage or overleverage. However, he showed that both theories imply the same comparative statics (i.e., the optimal debt level decreases with takeover costs). A manager chooses the optimal level of debt by maximizing his job tenure, which is threatened by takeover or financial distress. The higher the leverage, the higher the probability of financial distress, but the manager levers up because debt reduces a takeover threat. However, if takeover costs are large, a relatively low leverage will reduce enough of managerial agency cost, which is the source of the takeover gain, to make the takeover unprofitable. A manager thus underlevers the firm relative to the leverage that shareholders would like to implement in the absence of a takeover threat. In contrast, the manager levers up the firm as takeover costs decrease; however, the use of debt as a commitment to increase value can no longer deter the potential rider. If the financial distress costs are high enough, the manager may increase the leverage level beyond the value-maximizing level to impose an inefficient distress threat that makes it more difficult for the rider to increase value. Underleverage prevails when financial distress costs are not large enough to block the takeover or the manager is not willing to accept the risk of financial distress that is required to deter the rider. A takeover threat is thus unlikely to prevent agency cost in capital structure decisions and managers' capital structure choice should deviate from the value-maximizing level. Empirical evidence suggests that capital structure in a period of large takeover costs deviates from value-maximizing debt levels. Garvey and Hanka (1999), for example, found that leverage decreases with takeover costs, whereas Saffieddine and Titman (1999) report an increase in operating performance for firms that lever up the most in response to a takeover bid.

Novaes (2003) provided additional evidence because the findings do not provide unambiguous evidence that managers also choose capital structure because shareholders may want to reduce leverage in response to an increase in takeover costs to keep the takeover threat alive. Although one can interpret the reluctance to issue equity (Donaldson, 1961) and clustering new equity issues after big run-ups in stock prices (Asquith and Mullins, 1986) as a contradiction of managerial control over capital structure decisions because the costs of issuing equity should not deter managers from raising funds to avoid financial distress, Novaes (2003) argued that the managerial approach is in fact consistent with this evidence. The manager's objective is to deter the raider while imposing the smallest possible risk of being replaced in financial distress. A new equity issue decreases the leverage and increases the takeover threat, which the manager wants to

avoid. On the other hand, an increase in the firm's value improves the perception of the manager's skills and reduces the replacement gains. Decreasing the takeover threat, the manager delevers to reduce the probability of financial distress by issuing equity.

Finally, evidence supporting the view that firms decide on security issues to benefit managers rather than shareholders was also provided by Jung et al. (1996). They found that there are firms that do not have valuable investment opportunities and thus have high debt capacity and issue equity. One would not expect these firms to issue equity if the capital structure decisions were made by shareholders seeking to maximize their wealth. They found that firms without valuable investment opportunities experience a more negative share price reaction to equity issues compared to firms with better investment opportunities. In addition, they document other evidence confirming that managers have control over capital structure decisions. They showed that firms without valuable investment opportunities issuing equity also invest more than firms issuing debt, that firms with low managerial shareholdings have worse share price reactions, and that share price reactions occur for firms without valuable investment opportunities issuing equity to finance capital expenditures.

Showing that managers in fact control capital structure decisions, as well as investigating the channels through which capital structure decisions are affected in manager-governed firm, let us now analyze the leverage and determinants of capital structure decisions in manager-governed firm. Morellec (2004) showed that a manager trading off his empire-building ambitions and the potential loss of control would underlever the firm relative to the optimal capital structure that would maximize the value of the firm. The numerical results of his model suggest that leverage implemented by the manager amounts to only 17.6 percent (10.0 percent when corporate control consideration are not assumed), relative to the 37.0 percent that is the optimal leverage that a manager would implement if acting in the best interests of the shareholders and maximizing the value of the firm. In addition, the results suggest that leverage decisions are related to the degree of managerial entrenchment.

Because the manager makes capital structure decisions according to different rules than those assumed by modern capital structure theory, it is expected that capital structure choice is affected through different channels. That is why the impact of some capital structure determinants may also differ from those proposed by modern capital structure theory. Modern capital structure theory hypothesizes that volatility increases bankruptcy risk and reduces optimal leverage. Once the manager-shareholder conflict is introduced, Morellec (2004) showed that a nonmonotonic relation prevails. For lower volatility levels, the manager is completely entrenched and the only effect of increased volatility is an increase in bankruptcy costs. This results in a negative relation between volatility and leverage. For higher levels of volatility, an increase in volatility increases bankruptcy risk, as well as the degree of managerial entrenchment. At these levels, expected overinvestment costs increase, and so does the leverage necessary to prevent control challenges.

Growth rate has only a minor effect on optimal leverage according to modern capital structure theory, whereas it has a large effect when the manager-shareholder conflict is introduced. The higher the growth rate, the larger the overinvestment cost, and thus the higher the leverage necessary to prevent control challenges. At a high level of taxes, a manager would chose high levels of debt because he balances the utility derived from investment with the utility derived from firm value, whereas at low levels he would choose leverage of the lowest possible level that prevents control challenges because the costs of debt exceed the potential gain associated with tax shields. Growth options imply less overinvestment and lower potential gains from control challenges. It is thus expected that leverage will decrease with growth options.

Additional insights in capital structure decisions have been provided by post-Keynesian theory. Gordon (1994), assuming that the goal of the firm is to maximize the probability of long-term survival, argued that a firm's capital structure choice is tightly connected to its investment policy. A firm invests in order to decrease the difference between the desired and actual amount of capital. A firm with a low level of equity capital (e.g., per employee) earns an insufficient return that does not guarantee long-term survival. Therefore, it has a high ratio of desired to actual equity capital, and thus invests heavily. Such a firm can increase the growth rate only at higher variability of the rate of return, and thus it is willing to accept riskier investment projects and a higher share of debt financing. Only when the amount of equity capital exceeds the amount that guarantees long-term survival does a firm reduce investing and adopt a more conservative capital structure policy. At this level of equity capital, the risk of going bankrupt is lower at a lower share of debt financing. Taking into account the maximization of the equity capital growth rate, the optimal capital structure is expected to depend on the expected rate of return, its variability, the payout ratio, and the effective tax rate. However, the actual capital structure may depart from the optimal due to several reasons. Chamberlain (1990) argued that leverage also depends on the ability of the firm to earn monopoly profits and the expected earnings of the firm's investment opportunities relative to the expected earnings of the firm's existing assets. Leverage is thus expected to be positively correlated with the expected return on assets and the growth rate, and it is expected to decrease with the variability of the rate of return and the amount of equity capital (e.g., per employee). Leverage should be also negatively correlated with tangibility of assets because a higher tangibility of assets exposes a firm to lower risk, whereas less risky projects are primarily financed with equity capital and to a lesser extent with debt.

Let us continue the discussion with the demand for debt in employee-governed firm. As found for manager-governed firms, much of the literature, despite recognizing employee's objectives, does not refrain from the main assumption of modern capital structure theory about the stakeholder in control and the goal of the firm. It is assumed that firms are governed by shareholders and that capital structure decisions are made so as to maximize the value of the firm and thus shareholders' wealth. Debt in this setting serves as a bargaining tool used by shareholders to improve their positions in wage negotiations, and as a disciplining mechanism to

reduce inefficiencies resulting from employees pursuing their own interests rather than maximizing shareholders' wealth. As found for manager-governed firms, there is only scarce literature assuming that firms can be governed by employees that have a specific objective function and analyzing the resulting capital structure implications. The main findings of this literature suggest that these firms have lower demand for debt and that there are other channels through which capital structure decisions are affected.

Because labor unions tend to raise wages and impose other costs on firms, shareholders should try to improve their bargaining position by reducing the firm's financial flexibility. Shareholders credibly reduce the amount available for potential wage increases by issuing additional debt (Bronars and Deere, 1991). Dasgupta and Sengupta (1993) showed how the possibility of debt financing in the context of bilateral bargaining between the firm and its employees can alleviate the underinvestment problem associated with the inability to write a precommitment contract, identified by Grout (1984). On the one hand, debt increases the firm's bargaining power, but on the other it gives rise to a moral hazard cost because the higher the debt the more the effort chosen by employees will be diverted away from the first-best level. Debt financing may alleviate the underinvestment problem because more investments are undertaken to reduce the range of states in which bankruptcy occurs. Debt thus makes additional investments worthwhile. Perotti and Spier (1993) presented a strategic model of temporarily high leverage. They showed how capital structure serves as an effective bargaining tool for shareholders when the firm is currently not earning enough to cover senior obligations (wages), and senior claimants (employees) rely upon future investments for full repayment. By exchanging junior debt for equity, they alter their incentives to invest and may extract concessions from employees.

Cavanaugh and Garen (1997) considered the combined effect of asset specificity and unionization on the use of debt. Asset specificity affects capital decisions in two ways, through a collateral effect and an indirect effect. As suggested by Williamson (1988), asset specificity has a negative effect on the use of debt due to the poor collaterability of specific assets. However, in the presence of a powerful union, this effect may reverse. Because specific assets are associated with a greater amount of potentially expropriable quasi-rents, a firm should use debt to offset the increased ability to expropriate the rent by the union. Like Bronars and Deere (1991), Cavanaugh and Garen (1997) argued that unionism increases leverage; however, assets generally protect the firm from union expropriation because if a union attempts to acquire part of the return the assets can be sold to obtain the full value. Thus, unionization should not affect leverage if assets are general.[31]

Although some empirical evidence confirmed the hypothesis that shareholders improve their bargaining position by reducing the firm's financial flexibility (Bronars and Deere, 1991; Hirsch;

[31] However they empirically confirmed that asset specificity reduces the use of debt, and they found that union bargaining power in the presence of asset specificity strongly offsets this effect.

1991; Sarig; 1998; Hanka; 1998; Matsa, 2010), few US CFOs admitted in a 1999 survey by Graham and Harvey (2001) that "A high debt ratio helps us bargain for concessions from our employees". Kale et al. (2008), investigating the disciplining role of debt and analyzing the relation between employee productivity and leverage, argued that debt serves as a costly disciplining mechanism to mitigate agency conflicts. They found a positive influence on employee productivity up to some critical value at which negative effects resulting from the costs of financial distress begin to offset the disciplining incentives. However, the effect of debt on employee productivity weakens if employees have more outside employment opportunities.

Although one cannot argue against the role of debt in bilateral bargaining between the firm and its employees, as well as its disciplining aspects, it is expected that the optimal debt level is lower than that which maximizes the value of the firm when employees' interests are taken into account. Optimal debt level when employees face nonmonetary restructuring related costs was derived by Chang (1992). He derived optimal debt level investigating firms' restructuring decisions and deriving an optimal contract between shareholders and employees, which includes also capital structure choice. Restructuring, for example, involves asset liquidation, job reassignments and reallocations, and cost cutting, while losses include the time and effort that the relocated employees spend to learn new skills for new job assignments, extra effort due to a more demanding working environment, and so on. Because employees have no incentive to restructure, debt is used to implement the first-best restructuring rule. If the expected output exceeds the debt payment, debt can be rolled over and restructuring will not occur; otherwise the firm is forced to restructure because of the potential loss of control. He showed that an ex ante optimal level of debt that balances the financial as well as nonfinancial benefits of restructuring is generally below the level that maximizes the value of the firm because the restructuring-related costs to employees have to be accounted for.

Mramor and Valentinčič (2001) considered the theoretical framework that assumes that employees govern the firm. Because the goal of an employee-governed firm is to maximize wages, its capital structure is characterized by the lowest possible level of leverage. Črnigoj and Mramor (2009) provided strong empirical evidence of the negative correlation of leverage and the extent to which firms are characterized by employee-governed behavior. Črnigoj and Mramor (2009) also discussed some different channels through which capital structure choice is affected, and they identified some differences in the impact of the capital structure determinants proposed by modern capital structure theory. They argued that debt is preferred to equity when external sources are required because of the possible dilution of employees' control when issuing equity. Because employee-governed firms have a specific objective function, and compared to shareholders employees are more risk averse, they expected leverage to be negatively correlated with profitability and they expected faster-growing firms to operate with higher leverage. In addition, they expected employee-governed firms to be credit rationed, and thus bankruptcy cost and collateral to be an important determinant that affects the firm's leverage.

4.2.2 Risk aversion and demand for debt

As argued in the previous section, a large body of research followed Jensen and Meckling (1976) and used an ex ante efficiency perspective to derive predictions about a firm's capital structure choice in agency setting. The agency cost theory emphasizes the role of debt in reducing agency costs in relations between managers, as well as employees and shareholders, and resulted from employees and managers pursuing their own utility rather than maximizing shareholders' wealth. The problem is that the agency cost theory ignores the fact that capital structure choice itself is subject to an agency conflict. As argued in the previous section, conflicts of interest over capital structure choice arise because of managers' or employees' disutility derived when subject to the performance pressures resulting from large fixed interest payments (Jesnen, 1986; Grossman and Hart, 1982; Myers, 1977) and managers' preference for job retention (Haris and Raviv, 1988; Stulz, 1988; Israel, 1991; Zwiebel, 1996). This section discusses another important source of conflicts. This is managers' and employees' preference for lower risk due to the under-diversification of their human capital, which represents a large share of their wealth.

The portfolio theory states that the optimal portfolio of risky securities will be diversified across all securities available in the market (Markowitz, 1952). However, managers, as well as employees, invest a substantial part of their wealth (their human capital) in one firm. Hence, their risk is closely related to the firm's risk. A firm's failure to achieve predetermined performance targets, or in the extreme case the bankruptcy of the firm, results in employees and managers losing their current employment, and managers also seriously damaging their future employment opportunities. If labor markets function properly, any deviation of the firm's actual performance from shareholders' optimum should be settled in managers' and employees' compensation; namely, the agency cost will be fully borne by the manager or employee. The existence of such a settling-up mechanism would deter managers and employees from engaging in risk-reduction activities detrimental to shareholders. However, it is believed that the settling-up process is generally not a perfect one, and thus not entirely eliminates the risk-reduction incentives of managers and employees (Amihud and Lev, 1981). Even if managers are forced by the labor market to bear the agency cost (their risk-reduction activities imposed on shareholders), there might be situations in which the welfare gain to managers from such activities is greater than stockholders' welfare loss (Fama, 1980). Wage settlements cannot completely eliminate risk-reduction activities.

Moreover, risk cannot be effectively diversified by allocating human capital across many investments. An employee or a manager cannot hold more than one job at a time. Compared to the capital market, the labor market is also less flexible, meaning that human capital does not move across firms as financial capital. Finally, human capital investments are more long-term oriented. Managers and employees are therefore expected to diversify risk by other means. One of the ways is by choosing a conservative capital structure.

The first test of whether capital structure decisions are motivated by managerial risk-reduction motives was conducted by Friend and Lang (1988). They showed that a firm's leverage is negatively related to managers' shareholdings, reflecting the greater nondiversifiable risk of debt to managers than outside shareholders and the desires for maintaining low leverage. The existence of nonmanagerial principal shareholders seems to provide little evidence in affecting managers' conservative behavior. However, firms with large nonmanagerial shareholders tend to operate with higher leverage, suggesting that the existence of large nonmanagerial shareholders might force the interests of managers and shareholders to coincide. They also found that in public firms with a principal shareholder, nonmanagerial shareholders' leverage is still negatively related to managers' shareholdings; however, the impact is less significant than in closely-held firms. This reflects only a lesser desire and ability of management in public firms than in closely-held firms to adjust capital structure according to their own interests.[32]

In addition to the relation between managers' shareholdings and leverage, Mehran (1992) investigated the relations between leverage and executive incentive plans and monitoring by the board of directors and major shareholders. However, in contrast to findings obtained by Friend and Lang (1988), he found a positive relation between the long-term debt ratio and managers' shareholdings.[33] In addition, he found that leverage is positively correlated with the percentage of executives' total compensation in incentive plans and the percentage of investment bankers on the board and the percentage of equity owned by large investors. On the one hand, Mehran (1992) points out that that the capital structure theory ignoring agency costs is incomplete, and on the other he stresses the importance of compensation contracts, managerial ownership, and monitoring by the board of directors and major shareholders in reducing the conflicts of interest between managers and shareholders.

Strong evidence that the firm's capital structure is significantly affected by the degree of managerial entrenchment and that managers seek to avoid debt was provided by Berger et al. (1997). Examining the relations between leverage and corporate governance variables, they found that leverage is lower when the CEO has a long tenure in office, has weak stock and compensation incentives, and does not face strong monitoring from the board of directors or major shareholders. In addition, they investigated whether the leverage changes in the aftermath of events that reduce managerial entrenchment. They found that leverage increases by 13 percent on average when firms are targets of unsuccessful tender offers. The targets that increase leverage use the proceeds to finance large special dividends, equity repurchase offers, or operational restructuring. Although one can conclude that entrenched managers use leverage as a

[32] However, they found one puzzling piece of evidence. In public firms without principal shareholders, leverage increases with the managers' shareholdings.

[33] Evidence of the negative correlation of leverage to managers' shareholdings was also provided by Kim and Sorensen (1986). However, they focused more on the impact of the agency costs of debt put forward by Jensen and Meckling (1976) and Myers (1977), rather than on risk-reduction motives.

defensive commitment device, the apparent persistence of higher leverage for two years after an unsuccessful takeover suggests that managers tend to move to a more optimal capital structure, which they would have avoided if they had been able to remain entrenched. They also observed an increase in leverage after the replacement of the firm's CEO when the turnover appeared to be forced, as well as after a major stakeholder joined the board of directors. Moreover, they found that firms with leverage deficits react to threats to entrenchment by levering the firms beyond the predicted levels, whereas no significant changes in leverage are observed in firms with leverage surpluses.

In contrast, just a few contributions investigate the impact of employees' risk aversion on capital structure choice. However, in contrast to the findings in the previous section, very important theoretical findings were recently provided. Berk et al. (2007), recognizing the large human costs of bankruptcy, investigated capital structure implications by deriving an optimal employment contract. Their optimal employment contract builds on Harris and Holmstrom (1992). It guarantees employees job security, unless the firm is in financial distress, and pays a fixed wage that rises when employees are more productive than expected. This is why employees become entrenched. However, if the firm cannot make interest payments at the contracted wage level, the employees experience a temporary pay cut. If the firm's performance improves, wages return to the contracted level, and if it worsens further the firm is forced into bankruptcy. Because entrenched employees are being paid more than the value they create, shareholders benefit from filing bankruptcy and normally have no incentive to avoid bankruptcy. Employees are terminated or replaced with more productive ones. As a result, entrenched employees face substantial bankruptcy costs, such as taking a wage cut and earning the current market wage.

The implications for optimal leverage occur ex ante because the amount of risk sharing between shareholders and employees depends on leverage. Higher leverage implies a higher probability of bankruptcy and thus lower risk sharing. An optimal capital structure thus trades the benefits of risk sharing against the benefits of debt, such as tax shields, for example. Berk et al. (2007) argued that firms issue only modest levels of debt, and will also maintain cash balances despite these being associated with tax disadvantages. A firm's capital structure decisions are affected by the firm's idiosyncratic characteristics. Namely, firms with more risk-averse employees will operate with lower leverage. Because such firms attract other more risk-averse employees, they argued that the effect is self-enforcing. Heterogeneity in risk aversion in the labor market thus results in a clientele effect, implying a persistent heterogeneity in capital structure choices among otherwise identical firms. According to their optimal employment contract, firms with higher leverage pay higher wages to compensate employees for potential bankruptcy costs.

The effects of human capital costs associated with bankruptcy in capital structure decisions have also been empirically investigated. Chemmanur et al. (2009) tested whether firms with higher leverage pay their employees more and whether the resulting additional costs are large enough to

offset the incremental tax benefits of debt. They found that leverage has a positive impact on average employee pay and that the additional total labor expenses associated with an increase in leverage are large enough to offset all the incremental tax benefits. The evidence thus suggests that the incremental labor costs associated with an increase in leverage are substantial enough to limit the use of debt. They found also that leverage positively affects the magnitude of CEO compensation. Finally, they tested the importance of employees' entrenchment. Examining old versus new economy firms, associated with more and less entrenchment, respectively, they documented significant differences in the effect of leverage on average employee pay and CEO compensation. They observed a positive impact of leverage on average employee pay only in old economy firms. Similarly, the impact of leverage on CEO compensation proves to be significant only in old firms, whereas leverage in new economy firms tends to affect only the cash pay of the CEO.

Franck and Huyghebaert (2006) examined the relationship costs of various non-financial stakeholders, such as employees, suppliers and customers, as a determinant of capital structure. They used a sample of business start-ups because these firms need to build relationships from scratch, have high failure risk, and are characterized by large information asymmetry. Because start-ups are rather small, potential non-financial stakeholders may also be in a better bargaining position vis-à-vis the firm. They found that non-financial liquidation costs significantly affect capital structure. In particular, they found that non-financial liquidation costs are negatively related to leverage and the proportion of bank loans in total debt. However, they did not find any significant effect of non-financial liquidation costs on the maturity structure of bank loans. In addition, they found that suppliers' bargaining power has an impact on the relation between non-financial liquidation costs and capital structure, suggesting that suppliers can more easily pass on their expected liquidation costs to the firm when they have greater bargaining power. In contrast, they did not find any significant effect for employees and customers. They concluded that employees and customers are able to fully charge their expected liquidation costs when they enter into a contracting relationship with the firm, independent of their bargaining power. Furthermore, their results suggest that, when suppliers' and customers' bargaining power are large, start-up firms reduce their reliance on bank loans.

* *

Investigating the supply of debt to employee-governed and manager-governed firms using credit rationing models developed by Jaffe and Russell (1976), Keeton (1979), and Stiglitz and Weiss (1981, 1983), as well as demand for debt, bearing in mind their specific objective functions and risk aversion of these firms, I found that firms that take employees' and managers' interests into account operate with lower leverage compared to value-maximizing firms. In addition, I acknowledged other channels through which capital structure decisions are affected in these firms. The lower leverage in these firms results from a limited supply of debt, as well as a lower

demand for debt, whereas alternative capital structure determinants correspond to the specific objective functions of these firms.

The limited supply to employee-governed and manager-governed firms results from adverse selection and the moral hazard problem, which affect these firms' borrowing capacity more severely than the borrowing capacity of firms governed by shareholders. Moreover, employee-governed and manager-governed firms are constrained when using signals to mitigate adverse selection and the moral hazard problem.

Employee-governed and manager-governed firms have a specific objective functions, as well as being more risk averse. Employees tend to maximize wages, whereas the objectives of managers tend to be somewhere in between maximizing the utility stemming from wages and pecuniary and non-pecuniary benefits, and the value of the firm that affects their compensation. Higher risk aversion in employee-governed and manager-governed firms stems from the fact that employees' and managers' most important part of the claim in the firm does not come from diversified financial investments, but undiversified human capital investment. It is no surprise that these firms tend to opt for lower leverage compared to value-maximizing firms, as well as be driven by different forces when choosing their capital structures.

In the following chapter I provide evidence of the capital structure implications of having employees in control by conducting an empirical study.

5 An empirical study of capital structure decisions in employee-governed firm

The empirical study investigates capital structure decisions in employee-governed firms. Following the discussion in the previous chapter, employee-governed firms are expected to be faced with a limited supply of debt due to credit rationing and the firm's limited borrowing capacity, as well their limited abilities to signal their creditworthiness and thus to lower informational asymmetry characterizing the credit market. Employee-governed firms are also expected to have lower demand for debt because employee-governed firms have a specific objective function (i.e. employees tend to maximize wages), and are more risk averse compared to firms governed by other stakeholders. Therefore, it is expected that employee-governed firms will operate with lower leverage, tend to rely on internal sources to a greater extent than firms governed by other stakeholders, have to pledge more collateral, and be less levered at the same amount of earnings volatility compared to firms governed by other stakeholders. As argued by Črnigoj and Mramor (2009), employee-governed firms tend to avoid debt in general and prefer to borrow short-term when necessary. As argued by Flannery (1986) and Diamond (1991), by borrowing short-term instead of long-term and securing fewer resources than needed in the future, firms signal their creditworthiness. Compared to firms governed by other stakeholders, employee-governed firms, which are deprived of using other signals, such as investing their own funds in the firm, pledging collateral, and payout policy, are more inclined to use this manner of signaling. It is thus expected that employee-governed firms will have debt of shorter maturity. Because financial markets disfavor democratic firms (Gintis, 1989), it is also expected that employee-governed firms will be faced with a higher cost of debt. Instead of lending to employee-governed firms, lenders prefer to lend to firms governed by shareholders, which better protect their investments by enforcing value-maximizing decisions.

Aimed at covering different legal environments, this empirical study considers firms from the following western European countries: France, Germany, Sweden, and the United Kingdom (UK), as well as five central and eastern European countries: the Czech Republic, Hungary, Poland, Slovakia, and Slovenia, and the three Baltic states: Estonia, Latvia, and Lithuania (CEB). The data correspond to the seven-year period from 2001 to 2007. The data come from the AMADEUS database of Bureau van Dijk, which is a comprehensive pan-European database containing financial information on over 10 million public and private companies in 38 European countries. The capital structure implications of having employees in control are investigated using panel data regression analysis.

Based on the analysis of the evolution of corporate leverage in the period from 1998 to 2007 in the countries under investigation, it is concluded that capital structure decisions are driven by a

factor with a significant permanent component. Considering corporate governance issues, such as who governs the firm and what the objective function of the stakeholder in control is and thus the goal of the firm, one possible direction is to look for a firm-specific time-invariant component. By approximating the various channels through which employees' voice is manifested in corporate governance, I study the implications of having employees in control on firm's capital structure decisions. I consider employees' ownership rights, employees' entrenchment, and the firm's ownership structure. The regression results generally support the hypothesis that employee-governed firms operate with lower leverage compared to firms governed by other stakeholders. I found that firms with entrenched employees operate with significantly lower leverage but, in contrast to the expectations, I did not find evidence of lower leverage in employee-owned firms and firms with a more dispersed ownership structures. In addition, I found that employee-governed firms do not rely on internal sources to a greater extent than firms that are governed by other stakeholders and have to pledge more collateral to obtain debt financing. However, I documented strong evidence suggesting that employee-governed firms are less levered at the same amount of earnings volatility than firms governed by other stakeholders.

In contrast to the expectations, I did not find evidence that employee-governed firms choose debt of shorter maturity and, somewhat surprisingly, that employee-governed firms in some countries are faced with a lower (and not higher) cost of debt compared to firms governed by other stakeholders. It seems that lenders do not differentiate between firms using the price of debt, but instead using the quantity supplied.

5.1 Data

5.1.1 Database and samples

The empirical study considers firms from the following western European countries: France, Germany, Sweden, and the United Kingdom (UK), as well as five central and eastern European countries: the Czech Republic, Hungary, Poland, Slovakia, and Slovenia, and the three Baltic states: Estonia, Latvia, and Lithuania (CEB). The choice of countries is intended to cover different legal environments in Europe. La Porta et al. (1997, 1998) argued that differences in the development of the financial system stem from the differences in investors' protection and provided evidence that legal rules protecting investors and the quality of law enforcement vary systematically by legal origin. This legal origin is English, French, German, or Scandinavian. English law is common law, whereas French, German, and Scandinavian laws are part of the civil law tradition. Common law tends to protect investors the most and French the least, whereas German and Scandinavian are somewhere in the middle. CEB countries' modern legal systems are based on German civil law; however, despite scoring higher than the other three civil law

families on legal rules protecting investors, they are relatively less protective taking into account law enforcement (Pistor et al. 2000).

The data come from the AMADEUS database of Bureau van Dijk. This is a comprehensive pan-European database containing financial information on over 10 million public and private companies in 38 European countries. The data are reported in a comparable format that is needed for cross-country research. In addition to general descriptive information such as the firm's address, legal form, year of incorporation, industry code, and so on, it includes data for 24 balance sheet items, 25 profit and loss account items, and 26 financial ratios. Moreover, AMADEUS, like no other pan-European source, includes ownership information.

Although data were collected for an eleven-year period, the panels cover only a seven-year period (i.e., the period from 2001 to 2007). This is due to the fact that for some explanatory variables data from the four preceding years are required. Due to data availability, unbalanced panels are considered. For example, in Sweden, which has the highest percentage of firms represented in every year of the period under investigation, only 43.2 percent of firms could be used if balanced panels are used. The percentage amounts to only 26.9 percent in France, 28.8 percent in the UK, 10.7 percent in CEB, and less than 5 percent in Germany.

Because of the poor quality of data available for smaller firms in AMADEUS, as well as the aim of this study, only large firms (i.e., firms that have at least 250 employees) are addressed. As is typical for capital structure research, financial firms are excluded. Taking into account data from 1997 to 2007, the panels consist of a relatively large number of observations; however, when the variables of interest are calculated, it drops significantly. For the corresponding period there are 20,297 observations (4,244 firms) available in France, 6,434 observations (2,630 firms) in Germany, 7,229 observations (1,380 firms) in Sweden, 33,215 observations (6,946 firms) in the UK, and 11,752 observations (3,236 firms) in CEB.[34]

5.1.2 Descriptive statistics

As already mentioned, this study addresses large firms. As seen in Table 1 in Appendix 1, the average value of sales, total assets, and number of employees differs significantly across countries. In Sweden, for example, the mean value of sales amounted to EUR 4 billion, whereas it was around EUR 1.5 billion in Germany and CEB, and only around EUR 0.5 billion in France

[34] In addition, outliers are excluded. For most of the explanatory variables, outliers were defined by graphically inspecting distributions (no more than a few observations were defined as outliers), and for variables that take into account the number of employees, the lowest and the highest percentiles were excluded. Excluding several firms for variables that take the number of employees into consideration was necessary because the high variation in the number of employees for some firms was probably a mistake in the database.

and the UK. The mean value of total assets amounted to EUR 4.5 billion in Sweden, whereas it was around EUR 1.5 billion in Germany and CEB and EUR 0.5 billion in France and the UK. The same can be found for the median value of sales and total assets across countries. In all countries, the median value of sales and total assets was well below the mean values, suggesting that most of the firms are smaller than the mean firm. However, analyzing the number of employees, there were 5,247 employees in the mean German firm (775 in the median firm), 2,533 employees in mean French firm (459 in the median firm), 2,408 employees in the mean UK firm (560 in the median firm), 1,918 employees in the mean Swedish firm (481 in the median firm), and only 791 employees in mean firm within CEB countries (390 in the median firm). Although similar differences are observed when analyzing the relations in mean (median) values of earnings before interests and taxes (EBIT) and net income across countries, the firms exhibit very similar average returns on assets (ROA). The mean value of ROA amounts to 6 to 7 percent, whereas the median value is 1 to 1.5 percentage points lower.

As found in the existing literature on cross-country capital structure research, which was surveyed in the second chapter, firms' leverage differs on average across countries. As found by Rajan and Zingales (1995), the average firm in Germany has lower leverage than the average firm in France, but in contrast to their findings relatively higher leverage is observed in UK firms. The mean (median) value of total debt ratio amounts to 28.9 percent (26.0 percent) in Germany, 33.5 percent (31.5 percent) in France, and 45.3 percent (43.4 percent) in the UK. Lower leverage than in France and Germany is also observed in Sweden and CEB, 23.4 percent (17.8 percent) and 30.6 percent (26.5 percent), respectively. Similar relations are observed comparing average values taking into account only the long-term.

The next thing that has an important implication for this study concerns the evolution of leverage. Despite the fact that average leverage is fairly similar across years, there are significant differences among groups of firms that pursue different capital structure policies. I constructed four groups of firms based on their total debt ratio in 1998, defined as firms with a low, medium, high, and very high total debt ratio, and computed the average total debt ratio in all subsequent nine years, holding the composition of the groups constant. Groups were defined using 25th, 50th, and 75th percentiles for boundaries between groups. The results can be seen in Figure 1 in Appendix 1. Consistent with the findings of Lemmon et al. (2006), who conducted a similar analysis, two features can be observed. First, there are significant differences in leverage between groups and, second, there is a noticeable convergence among the leverage of groups over time.

For example, in France the mean total debt ratio of the group with low leverage in 1998 amounted to 9.3 percent, whereas the mean total debt ratio of the group with medium leverage amounted to 23.6 percent. The difference in 1998 thus amounted to 14.4 percentage points and is highly statistically significant. The mean total debt ratio of the group with low leverage increased to 25.0 percent in 2007, and the mean total debt ratio of the group with medium leverage

increased to 29.4 percent. The difference thus dropped to 4.3 percentage points, but remained highly statistically significant. The mean total debt ratio of the group with high leverage in 1998 amounted to 38.6 percent, and the mean total debt ratio of the group with very high leverage amounted to 60.2 percent, the difference being 21.6 percentage points and highly statistically significant. The mean total debt ratio of the group with high leverage decreased to 37.7 percent in 2007, and the mean total debt ratio of the group with very high leverage decreased to 46.9 percent; the difference thus dropped to 9.2 percentage points but remained highly statistically significant. Statistically significant differences are observed comparing the mean leverage of the group with medium leverage and the mean leverage of the group with high leverage, as well as the mean leverage of the group with low leverage and the mean leverage of the group with very high leverage. As seen in Figure 1 in Appendix 1, this is slightly different in Germany, where (except in 1998) only the differences between the group with very high leverage and other groups are statistically significant. Weak evidence of leverage persistence and convergence is due to a very low number of firms being represented in every year of the period under investigation. Again, similar patterns in the evolution of leverage as in France can be observed in Sweden, the UK, and CEB.

As argued by Lemmon et al. (2006), the differences in the leverage of different groups of firms may simply be capturing cross-sectional variation in underlying capital structure determinants identified by modern capital structure theory, such as profitability, tax status, bankruptcy cost, agency cost, and asymmetric information. Namely, if profitability (for example) tends to be negatively correlated with leverage, firms included in the group with low leverage may simply be more profitable firms. To address this issue, I calculated and compared the average value of the proxies for the most common capital structure determinants (i.e., profitability, tangibility of assets, and firm size) across groups. Based on the results, it would be difficult to argue that the differences correspond to cross-sectional variation in the factors most commonly found significant in capital structure research. In particular, only differences in firm size in France correspond to the sorting of groups in the period studied. In contrast, in other countries, none of the factors can explain the sorting of groups.

Based on the results obtained, it can be argued that capital structure decisions are driven by a factor with a significant permanent component and, moreover, traditional capital structure variables do not account for the variation in leverage. Because capital structure decisions are significantly affected by corporate governance issues, such as who governs the firm and what the objective function of the stakeholder in control is and thus the goal of the firm, one possible direction is to look for a firm-specific time-invariant component. Therefore, addressing the problem requires approximating these factors or at least controlling for unobserved heterogeneity if it is proved that the permanent component cannot be explained with the proposed proxies.

5.2 Methodology

5.2.1 Measures of leverage, debt maturity, cost of debt and explanatory variables

A firm's leverage is measured using two different ratios. Total debt ratio (LEV_1) is defined as the ratio of year-end long-term and short-term debt, and the year-end value of total assets. Long-term debt ratio (LEV_2) takes into account only long-term debt. Leverage is measured only in book values because the samples mostly consist of unlisted firms and thus do not have their market values available. Debt maturity (*MAT*) is approximated by the ratio of long-term debt to total debt, and cost of debt (*COST*) as the ratio of interests paid to total debt.

Employees' ability to affect capital structure decisions stems from at least three different sources. Employees can affect capital structure decisions if they have ownership rights in the firm. As argued in the third chapter, employees also govern the firm without owning the firm. In Germany, for example, a system of codetermination allows active participation of employees in the firm's decision-making process through workers' councils and employee and union representation on supervisory boards. Therefore, the more the corporate governance system recognizes employees' interest, the more employees' participation in decision-making is expected. Employees' participation is reflected in employees' entrenchment. Finally, employees' ability to affect capital structure decisions depends on the ownership structure and effectiveness monitoring.

Employees' ownership rights ($D_{E/M}$) are measured with a dummy variable, taking a value of 1 if the firm's main shareholders are employees or managers, and 0 if the firm's main shareholders are not employees or managers. Distinguishing only employee-owned firms is not possible because the AMADEUS database does not distinguish employee-owned and manager-owned firms. As argued by Jensen and Meckling (1976), as well as other authors, managerial ownership has an important influence on firm value. The higher the managerial ownership, the more powerful the incentives to make value-maximizing decisions. Focusing on managerial control motivations, Haris and Raviv (1988) and Stulz (1988) argued that managers use debt to increase their voting power, whereas Israel (1991) argued that this is to affect the distribution of cash flows between voting and nonvoting shares in order to influence the outcome of the takeover contest. However, Morck et al. (1988) argued that this may not hold over all ownership structures because high ownership shares may insulate managers against other disciplinary forces. However, empirical evidence suggests that capital structure decisions are motivated by managerial risk reduction motives (see for example Friend and Lang, 1988; Berger et al. 1997). Faleye et al. (2006) also found that firms in which labor has ownership stakes deviate from value

maximization. Therefore an unambiguous prediction about the effect of employees' ownership rights on leverage cannot be made. The same is true for debt maturity and the cost of debt ($D_{E/M}$).

The extent to which employees' interests are recognized, and thus their participation in decision-making, is reflected in employees' entrenchment. Employees' entrenchment results in extracting rents through wages and other benefits. Following Črnigoj and Mramor (2009), employees' entrenchment is measured taking into account their ability to increase wages based on value added increases. In particular, employees' entrenchment is approximated by the difference between the growth rate of labor costs per employee and the growth rate of value added per employee (*DIFF*). The higher the difference, the more entrenched employees are, and the lower the leverage. As argued by Črnigoj and Mramor (2009), employee-governed firms tend to avoid debt in general and besides prefer to borrow short-term when necessary. As argued by Flannery (1986) and Diamond (1991), by borrowing short-term instead of long-term and securing fewer resources than needed in the future, firms signal their creditworthiness. Employee-governed firms, which are deprived of using other signals, such as investing their own funds in the firm, pledging collateral, and payout policy, are more inclined to use this manner of signaling compared to firms governed by shareholders or managers. Because financial markets disfavor democratic firms (Gintis, 1989), it is also expected that employee-governed firms will be faced with a higher cost of debt. Rather than lending to employee-governed firms, lenders prefer to lend to firms governed by shareholders, which better protect their investments by enforcing value-maximizing decisions.

Finally, employees' impact on leverage decisions depends on the ownership structure and effectiveness monitoring. Ownership concentration and the effectiveness of monitoring is approximated by the ownership share of the largest shareholder (*OWNCON*). It is expected that the higher the ownership concentration, the higher the incentives to monitor and the enforcement of value-maximizing decisions. As argued by Jensen (1986), debt is one of the disciplining mechanisms. Thus, the higher the ownership concentration, the higher the leverage. Ownership concentration should also result in longer debt maturity and lower the cost of debt. Firms governed by blockholders enforce value-maximizing decisions and thus better protect their investments.

Modern capital structure theory, surveyed in the second chapter, suggests that a firm's leverage is dependent on factors such as profitability, tangibility of assets, firm size, and so on, which is why a bundle of control variables is used. Trying to take into account the factors that exert the most significant effect on capital structure decisions, as well as due to the limitation based on the data available in the AMADEUS database, five factors are considered. These are profitability, tangibility of assets, earnings volatility, firm size, and firm growth.

According to the pecking order hypothesis and the findings of empirical studies, leverage tends to be negatively correlated with profitability. Myers (1984) argued that a firm's financing process follows a pecking order, forcing the firm to exhaust internal sources first and, when external sources are required, to first issue debt, while issuing equity capital only as a last resort. Profitability can also proxy for growth opportunities and again have a negative impact on leverage. Myers (1977) viewed part of the corporate assets, particularly growth opportunities, as call options, whose value depends on discretionary future investments, and showed that by issuing risky debt a firm reduces its value by inducing a suboptimal investment strategy or by forcing the firm and its debt holders to bear the costs of avoiding the suboptimal strategy. In contrast, the trade-off theory suggests that profitability is positively associated with leverage. More profitable firms have a larger income to shield, thus operating with higher leverage compared to less profitable firms.

Tangibility of assets, on the other hand, is expected to have a positive impact on leverage. By pledging collateral, firms decrease the bankruptcy cost and tangible assets are more appropriate collateral compared to intangibles. Lenders are thus more willing to lend to firms that have more tangible assets. Myers and Majluf (1984) suggest that firms may find it advantageous to sell secured debt because firms securing debt by collateral with known values avoid the costs associated with underpricing resulting from asymmetric information. Jensen and Meckling (1976) argued that, if debt is collateralized, the borrower is restricted to using the funds for the specified project, whereas Myers (1977) stated that funds are used to pursue a more optimal investment policy. This means a lower free cash flow and debt overhang problem. However, the agency cost associated with the free-cash-flow problem tends to be higher in firms that have less collateralizable assets because monitoring of such firms is more difficult. Higher leverage is thus required to discipline the managers. As argued in previous chapter, by pledging collateral, firms also signal their creditworthiness to uninformed lenders and thus mitigate adverse selection and the moral hazard problem and thus credit rationing, as well increase their borrowing capacity.

Firms with more volatile earnings are expected to operate with lower leverage. Firms with more volatile earnings have a higher bankruptcy cost and thus according to the trade-off theory lower optimal capital structure.

Firm size is again expected be positively associated with leverage. Warner (1977) found that direct bankruptcy costs appear to constitute a larger proportion of firm value as the firm size decreases. Opler and Titman (1994) stressed the importance of the indirect costs of bankruptcy. They found that highly levered firms lose substantial market share to their less levered competitors, as well as market value of equity, in downturns. Larger firms tend to be more diversified and thus less prone to go bankrupt (Titman and Wessels, 1988). However, size can also proxy for information asymmetry and thus difficulties in tapping the capital market. Therefore, following Scott (1977), who showed that small firms tend to be faced with a higher

cost of issuing equity compared to larger firms, it is expected that small firms will operate with higher leverage.

Faster-growing firms tend to need more resources and, taking into account pecking order considerations, to accumulate higher debt levels. However, firm growth can also proxy for growth opportunities that result in higher information asymmetry. Then a negative impact is expected. As suggested by Jensen and Meckling (1976) and Myers (1977), shareholders tend to expropriate wealth from bondholders by investing in suboptimal fashion. Therefore, higher agency costs, which are also associated with growth opportunities, mean lower leverage.

Profitability (*ROA*) is approximated by the return on assets, calculated by the ratio of firm's earnings before interests and taxes and the average value of total assets. Asset tangibility (*TANG*) is approximated by the ratio of year-end value of fixed assets and year-end value of total assets. Earnings volatility (*SDROA*) is approximated by the standard deviation of ROA, calculated from a three-year period. Firm size (*SIZE*) is approximated by the logarithm of sales. Firm growth (*GS*) is approximated by the growth rate of sales.

Being aware of persistent differences in leverage across industries industry-specific effects are taken into account. To cover the 15 industries defined by sections in NACE Rev 1.1. industries, 14 dummy variables are included, with one being treated as a base category.

In addition to expecting employee-governed firms to operate with lower leverage compared to firms governed by other stakeholders, different impacts through capital structure determinants are expected. It is expected that employee-governed firms rely on internal sources to a larger extent, have to pledge more collateral, and are less levered at the same amount of earnings volatility compared to firms governed by other stakeholders. Namely, employee-governed firms tend to avoid debt (Črnigoj and Mramor, 2009), as argued in previous chapter, characterized by higher information asymmetry and agency cost, and being more risk averse compared to the firms governed by shareholders. Therefore, a dummy variable, which takes a value of 1 if the firm is employee-governed and 0 otherwise (D_{DIFF}), instead of *DIFF*, as well as the corresponding interactive terms, are used. The dummy variable indicating employee-governed is defined using *DIFF*, the 75th percentile being the boundary separating the value 1 from 0. Interactive terms are defined by multiplying a D_{DIFF} by *ROA*, *TANG*, and *SDROA*.

5.2.2 Econometric analysis of panel data

The use of panel data has recently become commonplace in econometric analysis. Panel data refer to pooling of observation on a cross-section of households, countries, or firms over several time periods. The econometric interest in panel data is the result of at least two different types of

motivations: the desire to control unobserved time-invariant heterogeneity in cross-sectional models and to disentangle components of variance and estimating transition probabilities among states, or more generally to study the dynamics of cross-sectional populations (Arellano, 2003).

These two motivations are loosely associated with two standards of panel data literature labeled as the fixed effects (FE) and random effects (RE) models. Green (2003) describes the logic behind these as follows. If in the pooled regression model of the form:

$$y_{it} = x'_{it}\,\beta + z'_{i}\,\alpha + \varepsilon_{it};\ i = 1,...,N \text{ and } t = 1,...,T\ ,$$

z_i contains only a constant term, then ordinary least squares (OLS) provides consistent and efficient estimates of common α and slope vector β.

However, if z_i is unobserved and correlated with x_{it}, then the OLS estimator of β is biased and inconsistent as a consequence of the omitted variable problem. The FE model:

$$y_{it} = x'_{it}\,\beta + \alpha_i + \varepsilon_{it}\,,$$

in which $\alpha_i = z_i\,\alpha$, takes α_i to be an individual-specific constant term in the regression model that does not vary over time. If the unobserved individual heterogeneity, on the other hand, is assumed to be uncorrelated with the explanatory variables, then the model can be formulated as:

$$y_{it} = x'_{it}\,\beta + \alpha + u_i + \varepsilon_{it}\,,$$

which can be a linear regression model with a compound disturbance consistently, albeit inefficiently, estimated by OLS. The RE model specifies u_i as a individual-specific random element, similar to ε_{it}, except that for each individual there is but a single draw that enters the regression identically in each period.

In the FE model, differences across units are captured in differences in the constant term. Treating each α_i as an unknown parameter to be estimated, one can include dummy variables for each unit and estimate the model, usually referred to as the least squares dummy variable model (LSDV), using OLS. However, if N is large, the model will include too many individual dummies to be handled. Then the LSDV estimator can be obtained by premultiplying the model by M_D, being equal to:

$$M_D = I - D(D'D)^{-1}D' = \begin{bmatrix} M_0 & 0 & \dots & 0 \\ 0 & M_0 & \dots & \\ 0 & 0 & \dots & M_0 \end{bmatrix} \text{ and}$$

$$M_0 = It - \frac{1}{T}ii',$$

and performing OLS on the transformed model.

Regression of $M_D y$ and $M_D X$, is equivalent to a regression of $[y_{it} - \bar{y}_{i.}]$ on $[x_{it} - \bar{x}_{i.}]$, in which $\bar{y}_{i.}$ and $\bar{x}_{i.}$ are vector means of y_{it} and x_{it} over T observations for group i.

For the RE model, assuming that u_i are random, generalized least squares (GLS) is used to estimate the parameters:

$$\hat{\beta} = (X'\Omega^{-1}X)X'\Omega^{-1}y = \left(\sum_{i=1}^{n} X'_i \Omega^{-1} X_i\right)^{-1}\left(\sum_{i=1}^{n} X'_i \Omega^{-1} y_i\right).$$

To compute the estimator by transforming the model, in a similar manner as for the FE model, but using GLS, $\Omega^{-1/2} = [I_n \otimes \Sigma]^{-1/2}$ is required, in which:

$$\Sigma^{-1/2} = \frac{1}{\sigma_\varepsilon}\left[I - \frac{\theta}{T} i_T i'_T\right] \text{ and}$$

$$\theta = 1 - \frac{\sigma_\varepsilon}{\sqrt{\sigma_\varepsilon^{\,2} + T\sigma_\varepsilon^{\,2}}}.$$

The transformation of y_i and X_i for GLS is:

$$\Sigma^{-1/2} y_i = \frac{1}{\sigma_\varepsilon} \begin{bmatrix} y_{t1} - \theta \bar{y}_t \\ y_{t2} - \theta \bar{y}_t \\ \dots \\ y_{tT} - \theta \bar{y}_t \end{bmatrix} \text{ and}$$

$$\Sigma^{-1/2} X_i = \frac{1}{\sigma_\varepsilon} \begin{bmatrix} X_{t1} - \theta \bar{X}_t \\ X_{t2} - \theta \bar{X}_t \\ \dots \\ X_{tT} - \theta \bar{X}_t \end{bmatrix}.$$

If the variance components are not known, one must first estimate the disturbance variances and then use the feasible generalized least squares (FGLS) procedure to estimate the parameters.

The GLS estimator is, like OLS in the FE model, a weighted average of the within- and between-units estimators:

$$\hat{\beta} = \hat{F}^{within} b^{within} + \left(I - \hat{F}^{within} \right) b^{between},$$

in which:

$$\hat{F}^{within} = \left[S_{xx}^{within} + \lambda S_{xx}^{between} \right]^{-1} S_{xx}^{within} \text{ and}$$

$$\lambda = \frac{\sigma_\varepsilon^{\,2}}{\sigma_\varepsilon^{\,2} + T\sigma_u^{\,2}} = (1 - \theta)^2 .$$

Because $\theta = 1$ and $\lambda = 1$ in the FE model, the extent that λ differs from 1 shows the inefficiency of OLS used to estimate RE model. Compared to GLS, OLS places too much weight on the between-units variation, meaning that it includes all the variation in X, rather than apportioning some of it to the random variation across groups attributable to the variation in u_i across units.

Panel data are also well suited to study dynamics. The dynamic model includes the lagged dependent variable, $y_{i,t-1}$. This results in a major change in the interpretation of the model. Without the lagged variables, the explanatory variables represent the full set of information that produce observed outcome y_{it}, whereas with a lagged variable there is the entire history of the

right-hand side variables. That is why any measured effect is conditioned on this history and any impact of x_{it} represents only the effect of new information.

When estimating the dynamic model of the form:

$$y_{it} = x'_{it}\,\beta + \gamma y_{i,t-1} + u_i + \varepsilon_{it},$$

one encounters additional problems. Because y_{it} is a function of u_i, it follows that y_{it-1} is also a function of u_i, resulting in the OLS estimator being biased and inconsistent even though ε_{it} are not serially correlated. For the FE estimator, the within transformation eliminates the u_i, but $\left[y_{it-1} - \bar{y}_{i.-1}\right]$ will still be correlated with $\left[\varepsilon_{it} - \bar{\varepsilon}_{i.}\right]$ even if ε_{it} are not serially correlated. As argued by Nickell (1981), the within estimator will be biased by O (1/T) and consistency will depend upon T being large.

The RE GLS estimator is also biased in the dynamic model because y_{it-1} is correlated with compound disturbance ($u_i + \varepsilon_{it}$) because the same u_i enters the equation for every observation in group i. However, if the individual effects are wiped out by applying first differences, the correlation between y_{it-1} and ε_{it} is easier to handle. Anderson and Hsiao (1981) suggested first differencing the model to eliminate the u_i and then using $\Delta y_{i,t-2} = [y_{i,t-2} - y_{i,t-3}]$ or just $y_{i,t-2}$ as an instrument for $\Delta y_{i,t-1} = [y_{i,t-1} - y_{i,t-2}]$. If ε_{it} are not serially correlated, these instruments will not be correlated with $\Delta\,\varepsilon_{it} = [\varepsilon_{it} - \varepsilon_{i,t-2}]$, resulting in the instrumental variable estimation method being consistent, but not always efficient estimates because it does not make use of all available moment conditions and does not take into account the differenced structure on the residual disturbances. Arellano and Bond (1991), arguing that additional instruments can be obtained if one utilizes the orthogonality conditions that exist between lagged values of y_{it} and the disturbances ε_{it}, proposed a generalized methods of moments (GMM) procedure that is more efficient than Anderson and Hsiao's (1982) estimator. Ahn and Schmidt (1995) derived additional nonlinear moment restrictions, and Arellano and Bover (1995) and Blundell and Bond (1998) generalized and extended their ideas and proposed a system estimator.

5.2.3 Regression models and estimation techniques

To test for the differences in leverage ratios in employee-governed firms and firms governed by other stakeholders, the following regression model was estimated:

$$LEV = \alpha + \beta_1 D_{E/M\,it} + \beta_2 DIFF_{it} + \beta_3 OWNCON_{it} + \beta_{4,j} CONTROLS_{it} + \varepsilon_{it},$$

in which:

LEV …….. total debt ratio or long-term debt ratio;
$D_{E/M}$ ……. employees' ownership rights, measured with a dummy variable, taking a value of 1 if the firm's main shareholders are employees or managers and 0 if the firm's main shareholders are not employees or managers;
DIFF …… employees' entrenchment, approximated by the difference between the growth rate of labor costs per employee and the growth rate of value added per employee; and
OWNCON .... ownership concentration, approximated by the ownership share of the largest shareholder.

CONTROLS include:

ROA ……..…… return on assets, calculated by the ratio of earnings before interests and taxes and the average value of total assets;
TANG …..……..... asset tangibility, approximated by the ratio of year-end value of fixed assets and year-end value of total assets;
SDROA ……..….... earnings volatility, approximated by the standard deviation of ROA, calculated from a three-year period;
SIZE ……..…… firm size, approximated by the logarithm of sales;
GS ……..……... firm growth, approximated by growth rate of sales; and

industry dummies.

In addition to the explanatory variables included in the static model, the dynamic model includes lagged values of leverage. The model can be written as:

$$LEV = \alpha + \beta_1 LEV_{i,t-1} + \beta_2 D_{E/M\,it} + \beta_3 DIFF_{it} + \beta_4 OWNCON_{it} + \beta_{5,j} CONTROLS_{it} + \varepsilon_{it},$$

in which:

LEV ……..... total debt ratio or long-term debt ratio;
LEV_{t-1} ……..... lagged value of total debt ratio or lagged value of long-term debt ratio:
$D_{E/M}$ ……..…. employees' ownership rights, measured with a dummy variable, taking a value of 1 if the firm's main shareholders are employees or managers and 0 if the firm's main shareholders are not employees or managers;
DIFF …..…… employees' entrenchment, approximated by the difference between the growth rate of labor costs per employee and the growth rate of value added per employee; and
OWNCON …. ownership concentration, approximated by the ownership share of the largest shareholder.

CONTROLS include:

ROA ……..…… return on assets, calculated by the ratio of earnings before interests and taxes and the average value of total assets;
TANG ……..……. asset tangibility, approximated by the ratio of year-end value of fixed assets and year-end value of total assets;
SDROA ……..….... earnings volatility, approximated by the standard deviation of ROA, calculated from a three-year period;
SIZE ……..…… firm size, approximated by the logarithm of sales;
GS ……..…….... firm growth, approximated by the growth rate of sales; and

industry dummies.

To test for the differences in the impact through capital structure determinants, the following regression model was estimated:

$$LEV = \alpha + \beta_1 D_{E/M\,it} + \beta_2 D_{DIFF\,it} + \beta_3 OWNCON_{it} + \beta_3 D_{DIFF\,it} ROA_{it} + \beta_4 D_{DIFF\,it} TANG_{it} + \beta_5 D_{DIFF\,it} SDROA_{it} + \beta_{6,j} CONTROLS_{it} + \varepsilon_{it} \quad ,$$

in which:

LEV …… total debt ratio or long-term debt ratio;
$D_{E/M}$ …….. employees' ownership rights, measured with a dummy variable, taking a value of 1 if the firm's main shareholders are employees or managers and 0 if the firm's main shareholders are not employees or managers;
D_{DIFF} …….. employees' entrenchment, approximated by a dummy variable taking a value of 1 if *DIFF* takes a value higher than the 75th percentile and 0 otherwise;
OWNCON ..... ownership concentration, approximated by the ownership share of the largest shareholder;
$D_{DIFF}ROA$ …….. interactive term, D_{DIFF} multiplied by *ROA*;
$D_{DIFF}TANG$ …… interactive term, D_{DIFF} multiplied by *TANG*; and
$D_{DIFF}SDROA$ …. interactive term, D_{DIFF} multiplied by SD*ROA*.

CONTROLS include:

ROA ……..… return on assets, calculated by the ratio of earnings before interests and taxes and the average value of total assets;
TANG ……..... asset tangibility, approximated by the ratio of year-end value of fixed assets and year-end value of total assets;
SDROA ……..….... earnings volatility, approximated by the standard deviation of ROA, calculated from a three-year period;
SIZE ……..…… firm size, approximated by the logarithm of sales;
GS ……..…….... firm growth, approximated by the growth rate of sales; and

industry dummies.

In addition to the explanatory variables included in the static model, the dynamic model includes lagged values of leverage. The model can be written as:

$$LEV = \alpha + \beta_1 LEV_{i,t-1} + \beta_2 D_{E/M\,it} + \beta_3 D_{DIFF\,it} + \beta_4 OWNCON_{it} + \beta_5 D_{DIFF\,it} ROA_{it} + \beta_6 D_{DIFF\,it} TANG_{it} + \beta_7 D_{DIFF\,it} SDROA_{it} + \beta_{8,j} CONTROLS_{it} + \varepsilon_{it} \quad ,$$

in which:

LEV ……	total debt ratio or long-term debt ratio;
LEV_{t-1} …….....	lagged value of total debt ratio or lagged value of long-term debt ratio:
$D_{E/M}$ ……...	employees' ownership rights, measured with a dummy variable, taking a value of 1 if the firm's main shareholders are employees or managers and 0 if the firm's main shareholders are not employees or managers;
D_{DIFF} ……..	employees' entrenchment, approximated by a dummy variable taking a value of 1 if *DIFF* takes a value higher than the 75th percentile and 0 otherwise;
OWNCON	ownership concentration, approximated by the ownership share of the largest shareholder;
$D_{DIFF}ROA$ ……..	interactive term, D_{DIFF} multiplied by *ROA*;
$D_{DIFF}TANG$ ……	interactive term, D_{DIFF} multiplied by *TANG*; and
$D_{DIFF}SDROA$ ….	interactive term, D_{DIFF} multiplied by SD*ROA*.

CONTROLS include:

ROA ……..……	return on assets, calculated by the ratio of earnings before interests and taxes and the average value of total assets;
TANG ……..….....	asset tangibility, approximated by the ratio of year-end value of fixed assets and year-end value of total assets;
SDROA …..……....	earnings volatility, approximated by the standard deviation of ROA, calculated from a three-year period;
SIZE …….……	firm size, approximated by the logarithm of sales;
GS …….……...	firm growth, approximated by the growth rate of sales; and

industry dummies.

To test for the differences in debt maturity in employee-governed firms and firms governed by other stakeholders, the following regression model was estimated:

$$MAT = \alpha + \beta_1 D_{E/M\,it} + \beta_2 DIFF_{it} + \beta_3 OWNCON_{it} + \beta_{3,j} CONTROLS_{it} + \varepsilon_{it},$$

in which:

MAT ……..... debt maturity, approximated by the ratio of long-term debt to total debt;
$D_{E/M}$ ….…… employees' ownership rights, measured with a dummy variable, taking a value of 1 if the firm's main shareholders are employees or managers and 0 if the firm's main shareholders are not employees or managers;
DIFF …… employees' entrenchment, approximated by the difference between the growth rate of labor costs per employee and the growth rate of value added per employee; and
OWNCON .... ownership concentration, approximated by the ownership share of the largest shareholder.

CONTROLS include:

ROA ……..…… return on assets, calculated by the ratio of earnings before interests and taxes and the average value of total assets;
TANG ……..... asset tangibility, approximated by the ratio of year-end value of fixed assets and year-end value of total assets;
SDROA ……..... earnings volatility, approximated by the standard deviation of ROA, calculated from a three-year period;
SIZE ……..…… firm size, approximated by the logarithm of sales;
GS ……..…….... firm growth, approximated by the growth rate of sales; and

industry dummies.

In another specification, in addition the value of a firm's leverage is included.

To test for the differences in cost of debt faced by employee-governed firms and firms governed by other stakeholders, the following regression model was estimated:

$$COST = \alpha + \beta_1 D_{E/M\,it} + \beta_2 DIFF_{it} + \beta_3 OWNCON_{it} + \beta_{3,j} CONTROLS_{it} + \varepsilon_{it},$$

in which:

COST …….. cost of debt, approximated by the ratio of interest paid to total debt;
$D_{E/M}$ ……. employees' ownership rights, measured with a dummy variable, taking a value of 1 if the firm's main shareholders are employees or managers and 0 if the firm's main shareholders are not employees or managers;
DIFF …… employees' entrenchment, approximated by the difference between the growth rate of labor costs per employee and the growth rate of value added per employee; and
OWNCON .... ownership concentration, approximated by the ownership share of the largest shareholder.

CONTROLS include:

LEV ……..…. total debt ratio or long-term debt ratio;
ROA ……..… return on assets, calculated by the ratio of earnings before interests and taxes and the average value of total assets;
TANG ……...…..... asset tangibility, approximated by the ratio of year-end value of fixed assets and year-end value of total assets;
SDROA ……..….... earnings volatility, approximated by the standard deviation of ROA, calculated from a three-year period;
SIZE ……..…… firm size, approximated by the logarithm of sales;
GS ……..……... firm growth, approximated by the growth rate of sales; and

industry dummies.

The parameters of the static models are estimated as pooled regression using OLS, while when assuming FE and RE, using generalized least squares (GLS). The parameters of dynamic models are estimated using the generalized method of moments (GMM): Anderson and Hsiao's (1982) estimator (AH), Arellano and Bond (1991) (AB), and Arellano and Bover's (1995) and Blundell and Bond's system estimator (SE).

5.3 Results

5.3.1 The firm's leverage

Regression results generally support the hypothesis that employee-governed firms operate with lower leverage compared to firms governed by other stakeholders. As seen in Tables 2 to 11 in

Appendix 2, the results indicate that across all countries, except in Germany, a firm's leverage is negatively correlated with employees' entrenchment, approximated by the difference between the growth rate of labor costs per employee and the growth rate of value added per employee (*DIFF*). However, the impact is statistically significant only taking into account total debt (Tables 2 to 6). OLS estimates of the regression coefficient range from −0.058 in the UK to −0.012 in Sweden. However, the *F*-test, testing for the statistical significance of the individual dummies, implies significant individual effects. OLS estimates that ignore individual effects suffer from the omission variables problem, thus being biased and inconsistent. As expected, estimate of the regression coefficient decreases in value when individual effects are taken into account. FE and RE estimates range from −0.36 in France to −0.009 in Sweden, and −0.037 in France and −0.009 in Sweden, respectively. The Hausman test statistic rejects the null hypothesis of no correlation between individual effects with the explanatory variable and thus the RE estimator.[35]

The results also suggest that employees' entrenchment, approximated by the difference between the growth rate of labor costs per employee and the growth rate of value added per employee (*DIFF*), is a factor with a permanent component. Thus corporate governance issues, such as who governs the firm and what the objective function of the stakeholders in control is, are one possible direction to look for a firm-specific time-invariant component determining the leverage of the firm. The estimates of the coefficient decrease in value, as well as statistical significance, going from OLS (which, except for employees' entrenchment, ignores individual effects) to FE or RE (which takes into account all individual effects). However, the *F*-test, which implies statistically significant individual effects despite controlling for employees' entrenchment, suggests that other important individual effects determine the leverage of the firm besides employees' entrenchment.

Except for France (in part), no statistically significant effect is observed in the dynamic model. This is somehow expected because employees' entrenchment, approximated by the difference between the growth rate of labor costs per employee and the growth rate of value added per employee (*DIFF*), approximates a permanent component being relatively stable over time.

Leverage is negatively correlated with employees' ownership rights, measured with a dummy variable, taking a value of 1 if the firm's main shareholders are employees or managers and 0 if the firm's main shareholders are not employees or managers ($D_{E/M}$), only in France and CEB, whereas this correlates positively in the UK. In Germany and Sweden the impact is not statistically significant. As for employees' entrenchment (*DIFF*), the results for employees' ownership rights are statistically significant only when total debt is considered. Weak evidence of the impact of employees' ownership rights on leverage was to some extent expected. The

[35] For total debt in Sweden and the UK the models fail to meet asymptotic assumptions of Hausman test.

AMADEUS database does not distinguish between employee-owned and manager-owned firms and therefore a dummy variable ($D_{E/M}$) considers employee and manager-owned firms together, although the behavior of employee-owned firms may differ from the behavior of firms owned by managers. Moreover, in all countries studied, employee- and manager-owned firms represent less than 0.5 percent of the firms, resulting in difficulties in proving any regularities.

In contrast to the expectations, a firm's leverage is generally negatively associated with ownership concentration and the effectiveness of monitoring, approximated by the ownership share of the largest shareholder (*OWNCON*); that is, statistically significant results were obtained in all countries, except in the UK, where the opposite association was observed. In most countries the results are statistically significant taking into account total debt or long-term debt. This suggests that large shareholders, except in the UK, substitute debt for another disciplining mechanism to align the interests of managers and employees with their own.

As expected, in addition to lower leverage in employee-governed firms, one can also observe significant differences in the impact through other capital structure determinants in employee-governed firms. As seen from Tables 12 to 16 in Appendix 2, employee-governed firms tend to be less levered at the same amount of earnings volatility, approximated by the standard deviation of ROA in a three-year period (*SDROA*), than firms governed by other stakeholders. Again, the results are statistically significant only taking into account total debt.[36] However, the results do not support the hypothesis that employee-governed firms rely on internal sources to a larger extent and have to pledge more collateral than firms governed by other stakeholders.

In line with the pecking order hypothesis, leverage across all countries is negatively correlated with profitability (*ROA*). The FE estimates of the regression coefficient, which are roughly the same as RE, but lower than OLS, range from −0.457 in the UK to −0.139 in Sweden when total debt is taken into account, and from −0.147 in the UK to −0.048 in France when long-term debt is taken into account. This suggests that firms in the countries studied rely on internal sources and increase their leverage only when internal sources are exhausted. However, profitability can also proxy for growth opportunities. Negative correlation then implies difficulties in borrowing against growth options. Consistent results were also obtained when testing the effect in the dynamic model; however, for all countries only when total debt is taken into account.

As found by previous studies, long-term debt is positively correlated with tangibility of assets (*TANG*). FE estimates, which are generally lower than OLS and RE estimates, range from 0.394 in France to 0.139 in the UK. When total debt is taken into account, a positive correlation is observed only in Germany and Sweden, whereas in other countries a negative or insignificant correlation is observed. The findings imply that firms have to pledge collateral when raising

[36] Therefore the regression results for long-term debt are not reported in the Appendix.

long-term debt, whereas collateral requirements do not play an important factor when raising short-term debt. Roughly consistent results were also obtained when testing the effect in the dynamic model.

In contrast to the expectations, leverage, except in Sweden, does not exhibit a significant correlation with earnings volatility (*SDROA*). This is found when total debt, as well as long-term debt, is taken into account. Likewise, no regularities were proved in the dynamic model. The result may be due to the possible nonmonotonic relation between leverage and earnings volatility that according to Morellec (2004) prevails if a manager-shareholder conflict is assumed. He argued that, for lower volatility levels, the manager is completely entrenched and the only effect of increased volatility is an increase in bankruptcy costs. This results in a negative relation between volatility and leverage. For higher levels of volatility, an increase in volatility increases bankruptcy risk, as well as the degree of managerial entrenchment. Something similar can be expected if an employee-shareholder conflict is assumed.

Leverage is positively correlated with firm size (*SIZE*) in France, Sweden, and the UK when total debt is taken into account, but only in Sweden when long-term debt is taken into account. The relation exhibits a negative correlation in Germany, but only when long-term debt is taken into account. The results thus confirm the hypothesis that bankruptcy costs constitute a larger proportion of firm value as the firm size decreases and that larger firms tend to be more diversified and thus less prone to go bankrupt, rather than the hypothesis that small firms tend to be faced with a higher cost of issuing equity compared to larger firms and are thus more levered.

The results provide weak evidence of a correlation between leverage and firm growth (*GS*). Leverage is positively correlated with firm growth in France and Germany when total debt is taken into account, and only in Germany when long-term debt is taken into account.

The estimates of the parameters of the dynamic model also imply that leverage is significantly affected by the leverage in the previous year. The inclusion of the lagged value of leverage in the regression model significantly reduced the effects of other capital structure determinants. The estimates of the regression coefficient range as high as 0.762 when total debt is taken into account and 0.781 when long-term debt is taken into account.

Finally, it was found that firms' leverage ratios are affected by industry-specific effects. Most industry dummies are highly statistically significant.

5.3.2 Debt maturity

In contrast, employee-governed firms do not exhibit expected behavior when choosing debt maturities. As seen in Tables 17 to 26 in Appendix 3, the results do not support the hypothesis that employee-governed firms choose debt of shorter maturities. Except in Germany, no statistically significant correlation of debt maturity to employees' entrenchment, approximated by the difference between the growth rate of labor costs per employee and the growth rate of value added per employee (*DIFF*), was found. The OLS estimate of the regression coefficient in Germany amounts to −0.047 and −0.043 if the value of the firm's leverage is included in the regression model. However, the *F*-test, testing for the statistical significance of the individual dummies, implies a significant individual effect, resulting in OLS suffering from the omission variables problem and thus being biased and inconsistent. As expected, the estimate of the regression coefficient decreases in value when individual effects are taken into account. The FE estimate does not exhibit statistical significance, whereas the RE estimate, being statistically significant, amounts to −0.038 and −0.033 if the value of the firm's leverage is included in the regression model. However, the Hausman test statistic across all countries rejects the null hypothesis of no correlation between individual effects with the explanatory variable and thus the RE estimator. In addition, although the OLS estimate of the regression coefficient for employees' ownership rights, measured with the dummy variable, takes a value of 1 if the firm's main shareholders are employees or managers and 0 if the firm's main shareholders are not employees or managers ($D_{E/M}$), and suggests that in France and the UK employees' ownership is positively correlated with debt maturity, the RE estimates are not statistically significant.

However, except in CEB, the results suggest that debt maturity is negatively correlated with ownership concentration and the effectiveness of monitoring, approximated by the ownership share of the largest shareholder (*OWNCON*). The RE estimates range from −0.0002 in the UK to −0.0017 in France and from −0.0003 in Germany to −0.0017 in France. Based on the findings, it can be concluded that, if shareholders use debt to control free-cash flow problems, they tend to use short-term debt rather than long-term debt.

Debt maturity is in France, Sweden, and the UK negatively correlated with profitability (*ROA*). However, the relation exhibits a positive correlation when the value of leverage is included in the regression model, but is statistically significant only in France, Germany, and CEB. Debt maturity is generally positively correlated with tangibility of assets (*TANG*). The results confirm the findings obtained when testing the leverage regression model that firms have to pledge collateral when raising long-term debt, whereas collateral requirements do not play an important factor when firms are raising short-term debt. Debt maturity is generally negatively correlated with earnings volatility (*SDROA*); however, FE estimates, except in CEB, besides being lower than OLS and RE estimates, do not exhibit statistical significance. Based on the result, it can be concluded that firms with more volatile earnings have shorter debt maturities. Debt maturity is

positively correlated with firm size (*SIZE*) in the UK whether the value of the firm's leverage is included in the regression model or not, and negatively in CEB, whereas in France and Sweden only if the value of the firm's leverage is included in the regression model.

As for the leverage ratios, it was found that debt maturity is affected by industry-specific effects. Most industry dummies are highly statistically significant.

5.3.3 Cost of debt

The evidence also suggests that employee-governed firms are generally not faced with a higher cost of debt. As seen in Tables 27 to 31 in Appendix 4, in all of the countries studied the cost of debt is not significantly correlated with employees' ownership rights, measured with the dummy variable, taking a value of 1 if the firm's main shareholders are employees or managers and 0 if the firm's main shareholders are not employees or managers ($D_{E/M}$). Moreover, the evidence, in contrast to the expectations, implies a negative impact of employees' entrenchment, approximated by the difference between the growth rate of labor costs per employee and the growth rate of value added per employee (*DIFF*) on the cost of debt. The effect is statistically significant in France and Germany. Based on the results, it can be concluded that employee-governed firms in these countries are actually faced with a lower cost of debt compared to the firms governed by other stakeholders. Only in CEB is weak evidence of a positive impact observed. Again, mixed evidence is obtained for the impact of ownership concentration and the effectiveness of monitoring, approximated by the ownership share of the largest shareholder (*OWNCON*). The relation exhibits a positive correlation in Germany and a negative one in the UK. As for the leverage regressions and debt maturity regressions, the *F*-test, testing for the significance of the individual dummies, implies a statistically significant individual effect, resulting in the OLS suffering from the omission variables problem and thus being biased and inconsistent. The Hausman test statistic across all countries rejects the null hypothesis of no correlation between individual effects with the explanatory variable and RE estimator.

The cost of debt is negatively correlated with profitability (*ROA*) only in Germany. The same findings were obtained investigating the impact of tangibility of assets (*TANG*) on the cost of debt. The results also do not support the hypothesis that firms with more volatile earnings (SDROA) are faced with a higher cost of debt. However, the evidence implies that the cost of debt is negatively correlated with firm size (*SIZE*). The effect is statistically significant in France, Germany, and Sweden. Based on the results, it can be concluded that larger firms in these countries are faced with a lower cost of debt. Again, no statistically significant evidence, except in Sweden, was obtained when investigating the impact of firm growth (GS) on the cost of debt. In Sweden, the cost of debt is negatively correlated with firm growth, suggesting that faster-growing firms obtain cheaper credit.

In contrast to the findings for the leverage ratios and debt maturity, it was found that the cost of debt is not significantly affected by industry-specific effects. None of the industry dummies across countries are statistically significant.

* *

Using firm-level data from 12 European countries (France, Germany, Sweden, the United Kingdom [UK], the Czech Republic, Hungary, Poland, Slovakia, Slovenia, Estonia, Latvia, and Lithuania), I found that capital structure decisions are driven by a factor with a significant permanent component. Considering corporate governance issues, such as who governs the firm and what the objective function of the stakeholder in control is and thus the goal of the firm, is one possible direction to look for the firm-specific time-invariant component. By approximating various channels through which employees' voice is manifested in corporate governance, I studied the implications of having employees in control on firm's capital structure decisions. I considered employees' ownership rights, employees' entrenchment, and firms' ownership structure. The regression results generally support the hypothesis that employee-governed firms operate with lower leverage compared to firms governed by other stakeholders. I found that firms with entrenched employees operate with significantly lower leverage, whereas, in contrast to the expectations, I did not find evidence of lower leverage in employee-owned firms and firms with more dispersed ownership structures. In addition, I documented strong evidence suggesting that employee-governed firms are less levered at the same amount of earnings volatility than firms governed by other stakeholders. However, I did not find evidence that employee-governed firms do rely on internal sources to a higher extent than firms governed by other stakeholders and that have to pledge more collateral to obtain debt financing.

In contrast to the expectations, I also did not find evidence that employee-governed firms choose debt of shorter maturity and, somewhat surprisingly, that employee-governed firms in some countries are faced with a lower (and not higher) cost of debt compared to firms governed by other stakeholders. It seems that lenders do not differentiate between firms using the price of debt, but instead using the quantity supplied.

Empirically examining capital structure decisions, I provided strong empirical evidence of the capital structure implications of having employees in control and contribute to the scarce literature available in this field. The main limitation of the empirical study relates to the inability of the proxy used to approximate employees' entrenchment, which nonetheless proved that it can explain conservative financial behavior, to explain a time-invariant permanent component that is a primary determinant of a firm's leverage. I believe that by more accurately approximating employees' entrenchment, one would explain more of the time-invariant permanent component. Other limitations refer to the abilities to draw conclusions about the effects of employees'

ownership rights and ownership concentration, which results from using a database that is not the most appropriate for analyzing ownership structures.

Conclusions

Recognizing the inability of modern capital structure theory and hypothesizing about what led it into a fallacy, I went back to the main underlying assumption of modern corporate finance about the goal of the firm. In order to develop a new corporate governance paradigm, I surveyed corporate governance systems around the world and reviewed the new theory of the firm (Rajan and Zingales, 1998; Aghion and Tirole, 1997). Finding that stakeholders other than shareholders, such as employees and managers, significantly affect the behavior of the firm, as well as identifying alternative sources of power within the firm. I derived the claims of various stakeholders using the option pricing theory developed by Black and Scholes (1973) and Merton (1973, 1974) and defined their objective functions and hypothesized about the goal of the firm. I hypothesized that an employee-governed firm is aimed at maximizing wages and minimizing the probability of bankruptcy. Because employees have a limited horizon, employees' objectives compared to those of the shareholders are more short-term oriented and, moreover, their objectives are characterized by higher risk aversion. Managers maximize utility stemming from wages and pecuniary and non-pecuniary benefits, and only then the value of the firm that affects their compensation. However, in practice they end up maximizing revenues or growth of the firm. Because their reputation is at stake when running the firms, their objectives favor firm survival.

Proceeding from the objective functions of employee-governed and manager-governed firms, I investigated the capital structure implications of having employees and managers in control. Using the credit-rationing models developed by Jaffe and Russell (1976), Keeton (1979), and Stiglitz and Weiss (1981, 1983), I studied the supply of debt to employee-governed and manager-governed firms, and I hypothesized about the demand for debt, bearing in mind the specific objective functions and risk aversion of employee-governed and manager-governed firms. I argued that because of adverse selection and the moral hazard problem, as well as the inability of employee-governed and manager-governed firms to signal their creditworthiness to uniformed lenders, these firms are faced with a limited supply of debt. Because employee-governed and manager-governed firms have a specific objective functions and are more risk averse compared to firms governed by shareholders, these firms have a lower demand for debt.

Finally, I investigated the capital structure implications of having employees in control by conducting an empirical study addressing firms from countries with different legal environments; that is, countries in which the legal system is based on common and civil law tradition. I considered firms from the following western European countries: France, Germany, Sweden, and the United Kingdom (UK), as well as five central and eastern European countries: the Czech Republic, Hungary, Poland, Slovakia, and Slovenia, and the three Baltic states: Estonia, Latvia, and Lithuania (CEB). Using panel data regression analysis, I provided strong empirical evidence

of the capital structure implications of having employees in control. I considered employees' ownership rights, employees' entrenchment, and firms' ownership structure. The regression results generally support the hypothesis that employee-governed firms operate with lower leverage compared to firms governed by other stakeholders. I found that firms with entrenched employees operate with significantly lower leverage, whereas, in contrast to the expectations, I did not find evidence of lower leverage in employee-owned firms and firms with more dispersed ownership structures. In addition, I documented strong evidence suggesting that employee-governed firms are less levered at the same amount of earnings volatility than firms governed by other stakeholders. However, I did not find evidence that employee-governed firms do rely on internal sources to a higher extent than firms governed by other stakeholders and that have to pledge more collateral to obtain debt financing. In contrast to the expectations, I also did not find evidence that employee-governed firms choose debt of shorter maturity and, somewhat surprisingly, that employee-governed firms in some countries are faced with a lower (and not higher) cost of debt compared to firms governed by other stakeholders. It seems that lenders do not differentiate between firms using the price of debt, but instead using the quantity supplied.

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Appendix

Appendix 1

Table 1: Descriptive statistics
Figure 1: Evolution of leverage

Table 1: Descriptive statistics

The table presents descriptive statistics (mean, median and standard deviation) of the panels used in the empirical study. LEV_1 refers to total debt ratio, defined as the ratio of year end long-term and short-term debt and the year end value of total assets. LEV_2 refers to long-term debt ratio which takes into account only long-term debt.

in thousand EUR

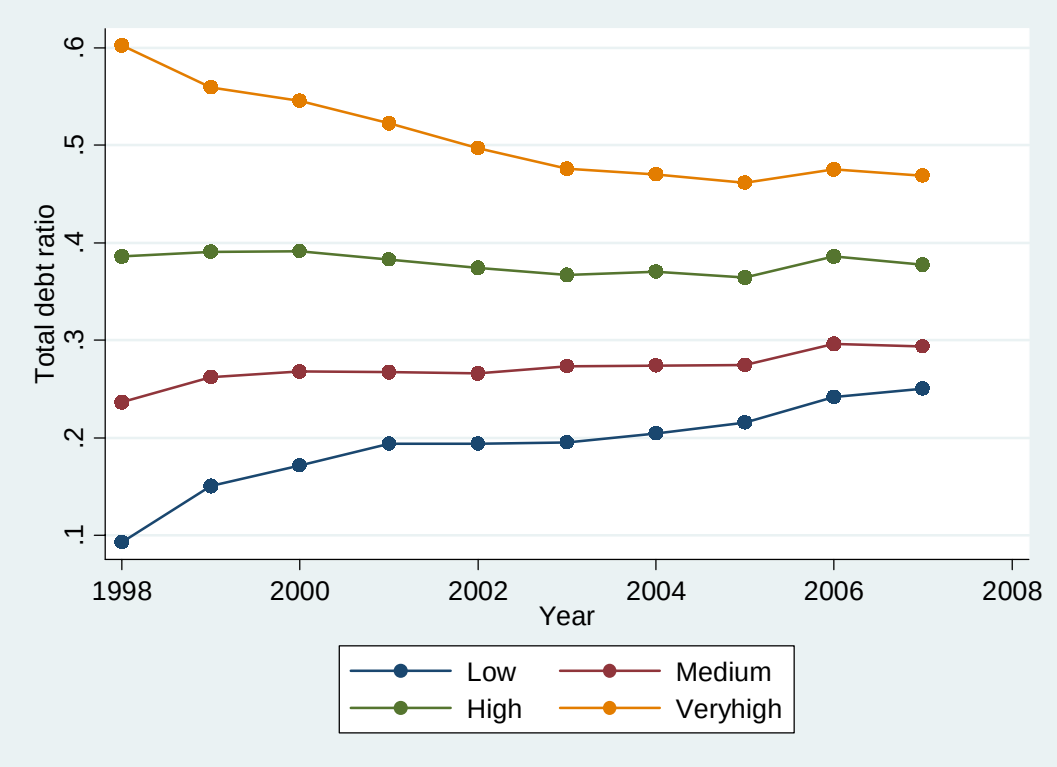
	France			***Germany***			***Sweden***		
	Mean	Median	Standard deviation	Mean	Median	Standard deviation	Mean	Median	Standard deviation
Sales	531,909	80,218	3,580,866	1,358,684	160,961	7,134,340	4,043,920	1,029,295	1.38e+07
Total assets	596,719	54,044	5,018,604	1,692,185	130,818	1.15e+07	4,322,995	678,346	1.82e+07
No. of employees	2,533	459	16,715	5,247	775	27,709	1,918	481	8,377
EBIT	39,060	2,419	391,936	83,172	6,952	482,794	302,902	41,754	1,650,527
Net income	17,609	1,421	337,528	51,192	2,692	352,960	210,138	23,075	1,398,978
ROA	0.064	0.056	0.103	0.070	0.060	0.123	0.075	0.067	0.127
Total debt ratio	0.335	0.315	0.186	0.289	0.260	0.210	0.234	0.178	0.019
Long-term debt ratio	0.033	0	0.090	0.145	0.088	0.170	0.093	0.0003	0.153
Observations	20,297			6,434			7,229		
Firms	4,244			2,630			1,380		

	UK			***CEB***		
	Mean	Median	Standard deviation	Mean	Median	Standard deviation
Sales	380,749	66,027	2,842,317	1,537,487	357,032	7,867,074
Total assets	479,028	47,070	5,046,018	1,419,614	268,888	7,641,494
No. of employees	2,408	560	10,900	791	390	1,697
EBIT	26,785	2,134	335,843	94,527	9,096	749,988
Net income	18,619	1,553	266,105	72,360	5,114	640,885
ROA	0.062	0.060	0.132	0.071	0.054	0.124
Total debt ratio	0.453	0.434	0.273	0.306	0.265	0.263
Long-term debt ratio	0.128	0.038	0.183	0.064	0.014	0.120
Observations	33,215			11,752		
Firms	6,946			3,236		

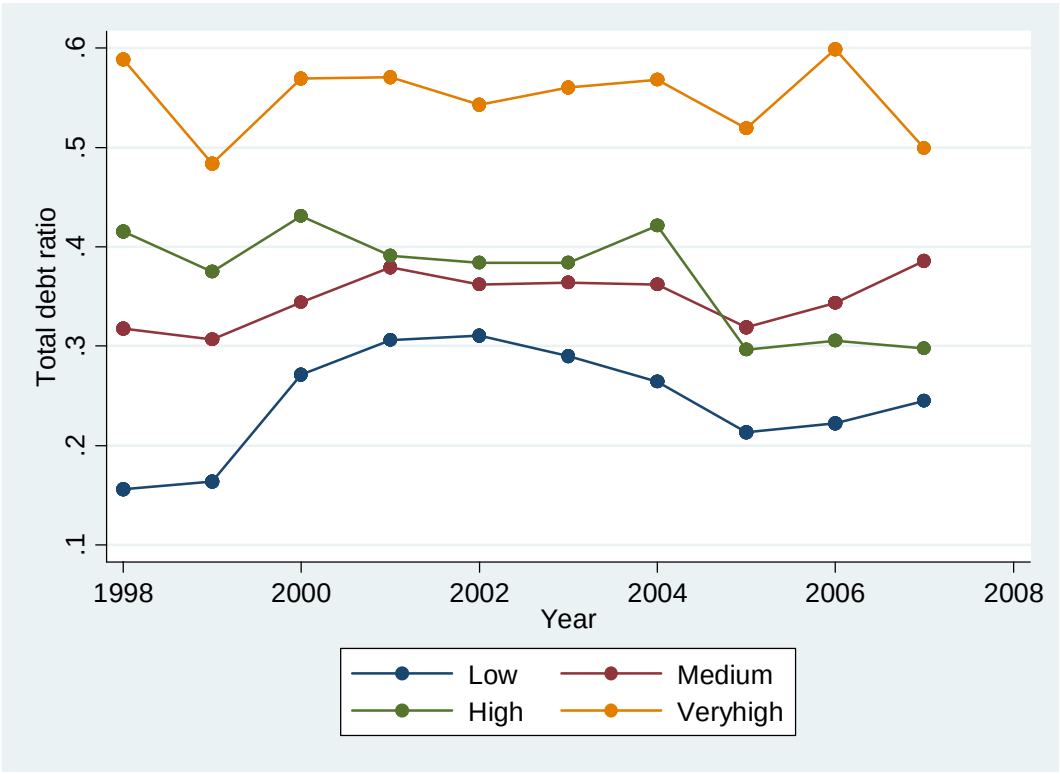
Figure 1: Evolution of leverage

The panels in the figure show the evolution of leverage in 10-year period of four groups of firms based on their total debt ratio in year 1998 (firms with low, medium, high and very high total debt ratio).

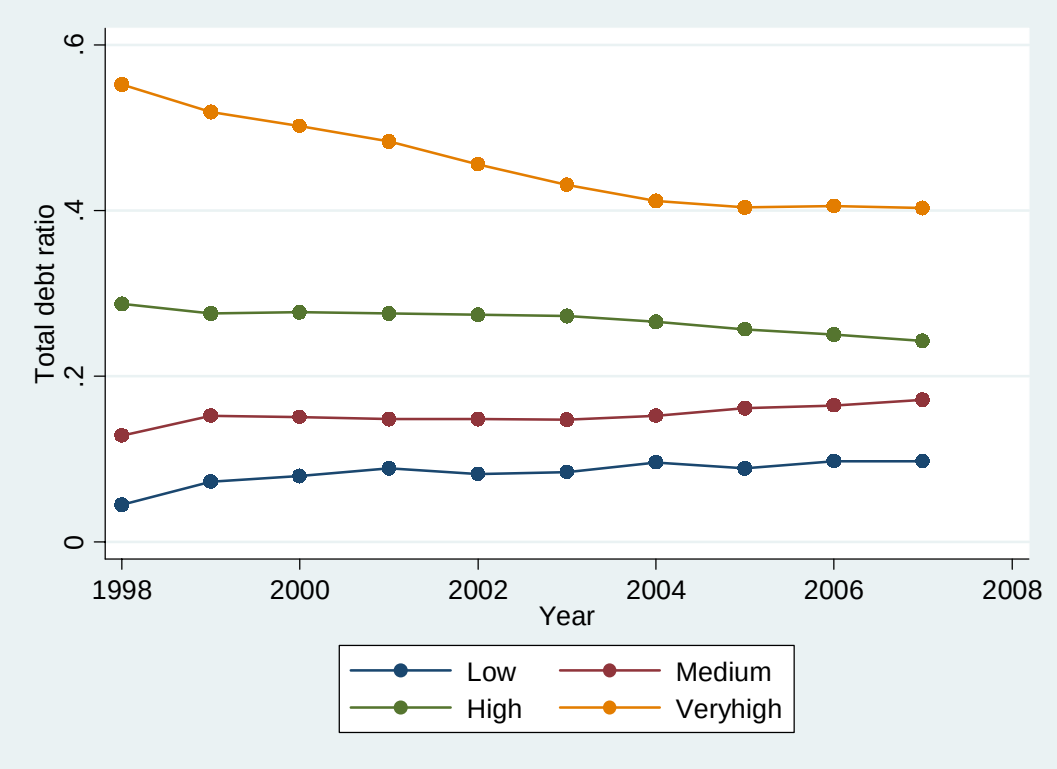
Panel A: France



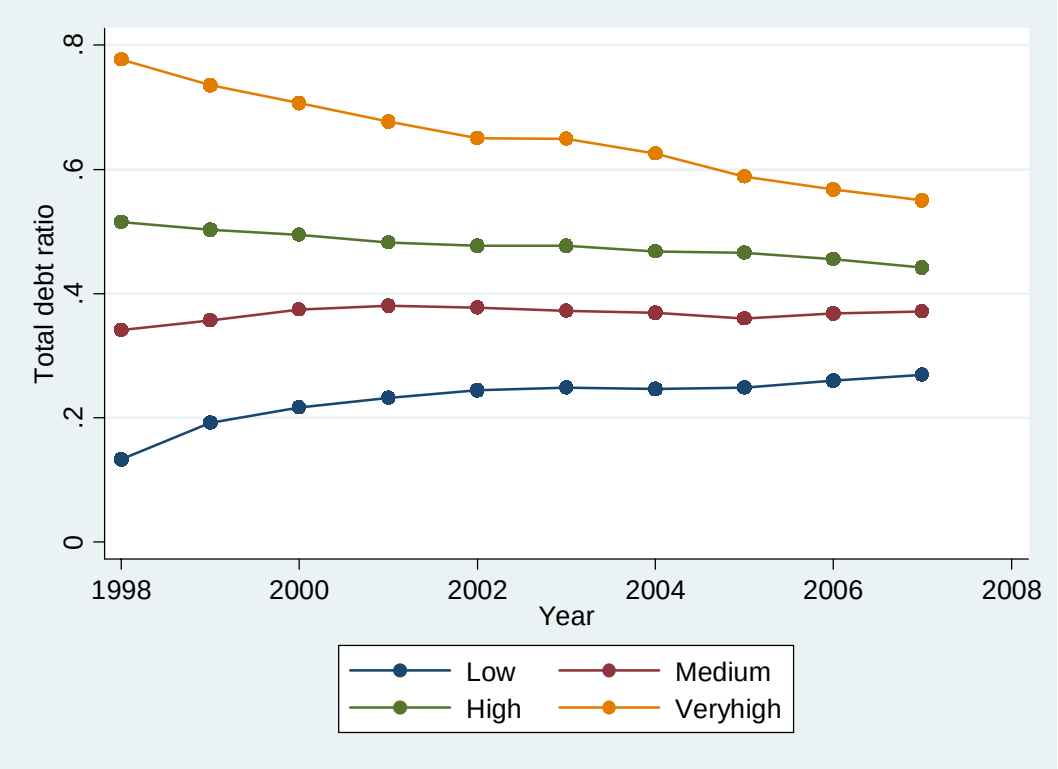
Panel B: Germany



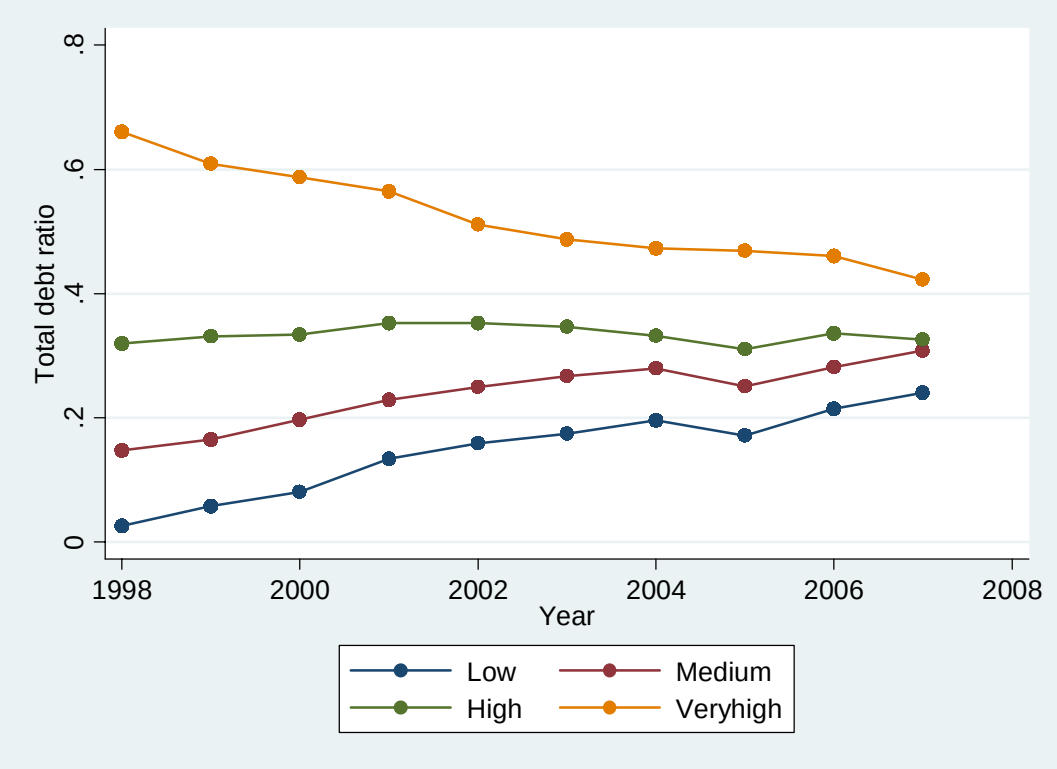
Panel C: Sweden



Panel D: UK


Total debt ratio
0
.2
.4
.6
.8
1998
2000
2002
2004
2006
2008
Year
Low
Medium
High
Veryhigh

Panel E: CEB


Total debt ratio
0
.2
.4
.6
.8
1998
2000
2002
2004
2006
2008
Year
Low
Medium
High
Veryhigh

Appendix 2

Table 2: Regression results / Total debt / France
Table 3: Regression results / Total debt / Germany
Table 4: Regression results / Total debt / Sweden
Table 5: Regression results / Total debt / UK
Table 6: Regression results / Total debt / CEB
Table 7: Regression results / Long-term debt / France
Table 8: Regression results / Long-term debt / Germany
Table 9: Regression results / Long-term debt / Sweden
Table 10: Regression results / Long-term debt / UK
Table 11: Regression results / Long-term debt / CEB
Table 12: Regression results / Total debt with interactive terms / France
Table 13: Regression results / Total debt with interactive terms / Germany
Table 14: Regression results / Total debt with interactive terms / Sweden
Table 15: Regression results / Total debt with interactive terms / UK
Table 16: Regression results / Total debt with interactive terms / CEB

Table 2: Regression results / Total debt / France

The table presents regression results for total debt in France (regression coefficients, t –test and p – values). Dependent variable is total debt ratio (LEV_1). Explanatory variables include employees' ownership rights ($D_{E/M}$) employees' entrenchment (*DIFF*), ownership concentration (*OWNCON*), profitability (*ROA*), tangibility of assets (*TANG*), earnings volatility (*SDROA*), firm size (*SIZE*), and firm's growth (*GS*), and lagged value of total debt ratio in dynamic model (LEV_1*_lagged*). All specifications include also industry dummies and year dummies. Besides, F-test, testing for the significance of individual effects, Hausman test, evaluating the significance of FE versus RE estimator, as well as number of observation and adjusted R-squared, are reported.

Variable	OLS	FE	RE	AH	AB	SE
ROA	-.46340372	-.37884945	-.39318434	-.30775486	-.30703095	-.25285232
	-35.09	-24.89	-29.26	-16.19	-11.41	-15.13
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TANG	-.03385976	.00459181	-.01008545	-.00391582	.00194272	-.02099906
	-4.20	0.30	-0.90	-0.20	0.07	-2.52
	0.0000	0.7643	0.3707	0.8409	0.9481	0.0117
SDROA	.2414169	.10943169	.13692142	.03145916	.0408521	.01413672
	5.56	3.13	4.14	0.78	0.65	0.20
	0.0000	0.0017	0.0000	0.4328	0.5185	0.8378
SIZE	.02445913	.02666501	.02325579	.02369659	.02620632	.01397689
	24.63	9.45	14.32	7.46	4.49	10.63
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
GS	.00021276	.00062795	.00058853	.00102176	.00107417	.00159472
	0.46	2.08	2.03	3.39	5.01	5.52
	0.6424	0.0372	0.0420	0.0007	0.0000	0.0000
$D_{E/M}$	-.05994981	0	-.07066448			-.00427979
	-1.90	.	-1.03			-0.19
	0.0577	.	0.3044			0.8485
DIFF	-.04173986	-.0360163	-.03716123	-.02172515	-.02172899	.00064
	-5.11	-6.95	-7.38	-3.72	-2.89	0.08
	0.0000	0.0000	0.0000	0.0002	0.0038	0.9396
OWNCON	.00008688	0	.00002289			.00024415
	1.49	.	0.20			4.34
	0.1360	.	0.8433			0.0000
LEV_1*_lagged*				.21986742	.23736951	.52639644
				4.49	5.41	19.14
				0.0000	0.0000	0.0000
_cons	.08651102	.06369644	.07368038			-.00298734
	2.85	2.01	1.43			-0.22
	0.0044	0.0443	0.1528			0.8278
F-test		14.47 (0.000)				
Hausman test		34.17 (0.000)				
N	20,297					
R-squared	0.1929	0.1055	0.1920			

Table 3: Regression results / Total debt / Germany

The table presents regression results for total debt in Germany (regression coefficients, t –test and p – values). Dependent variable is total debt ratio (LEV_1). Explanatory variables include employees' ownership rights ($D_{E/M}$) employees' entrenchment (*DIFF*), ownership concentration (*OWNCON*), profitability (*ROA*), tangibility of assets (*TANG*), earnings volatility (*SDROA*), firm size (*SIZE*), and firm's growth (*GS*), and lagged value of total debt ratio in dynamic model (LEV_1*_lagged*). All specifications include also industry dummies and year dummies. Besides, F-test, testing for the significance of individual effects, Hausman test, evaluating the significance of FE versus RE estimator, as well as number of observation and adjusted R-squared, are reported.

Variable	OLS	FE	RE	AH	AB	SE
ROA	-.14546396	-.15759676	-.16100415	-.17989605	-.17690883	-.08078297
	-6.17	-5.80	-7.52	-4.64	-2.89	-3.81
	0.0000	0.0000	0.0000	0.0000	0.0039	0.0001
TANG	.27553736	.15808933	.23904248	.00040008	.01958305	.05551524
	21.26	5.36	14.61	0.01	0.29	5.71
	0.0000	0.0000	0.0000	0.9938	0.7749	0.0000
SDROA	-.22183514	-.02742964	-.08751082	-.06592788	-.05033727	-.07421359
	-4.29	-0.63	-2.32	-1.09	-1.00	-2.64
	0.0000	0.5294	0.0203	0.2743	0.3163	0.0082
SIZE	.01335273	-.00254498	.00863335	-.01512708	-.02160903	.00625896
	7.03	-0.41	3.11	-1.73	-1.07	3.56
	0.0000	0.6831	0.0019	0.0842	0.2855	0.0004
GS	.00578694	.01073618	.0093923	.01106353	.01256792	.00750481
	2.07	7.00	6.49	4.65	4.62	6.92
	0.0381	0.0000	0.0000	0.0000	0.0000	0.0000
$D_{E/M}$	-.08416006	0	-.06009446			-.01707136
	-0.88	.	-0.54			-0.63
	0.3780	.	0.5915			0.5291
DIFF	-.00894645	-.00253442	-.00565911	.00313528	-.00146695	.01284559
	-0.74	-0.35	-0.85	0.32	-0.14	1.64
	0.4579	0.7243	0.3980	0.7523	0.8855	0.1007
OWNCON	-.00114913	0	-.00106851			-.00051141
	-11.33	.	-6.81			-5.99
	0.0000	.	0.0000			0.0000
LEV_1*_lagged*				.63491902	.44313193	.64429248
				3.73	3.27	23.25
				0.0002	0.0011	0.0000
_cons	.0568384	.29691513	.15683971			.05091746
	0.63	3.81	1.15			2.22
	0.5314	0.0001	0.2509			0.0263
F-test		13.03 (0.000)				
Hausman test		29.66 (0.000)				
N	6,434					
R-squared	0.1762	0.0371	0.1753			

Table 4: Regression results / Total debt / Sweden

The table presents regression results for total debt in Sweden (regression coefficients, t –test and p – values). Dependent variable is total debt ratio (LEV_1). Explanatory variables include employees' ownership rights ($D_{E/M}$) employees' entrenchment (*DIFF*), ownership concentration (*OWNCON*), profitability (*ROA*), tangibility of assets (*TANG*), earnings volatility (*SDROA*), firm size (*SIZE*), and firm's growth (*GS*), and lagged value of total debt ratio in dynamic model (LEV_1*_lagged*). All specifications include also industry dummies and year dummies. Besides, F-test, testing for the significance of individual effects, Hausman test, evaluating the significance of FE versus RE estimator, as well as number of observation and adjusted R-squared, are reported.

Variable	OLS	FE	RE	AH	AB	SE
ROA	-.13909313	-.1393735	-.12570634	-.0955949	-.09544759	-.08449564
	-7.18	-8.28	-8.05	-4.16	-3.92	-5.19
	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000
TANG	.11333618	.05365733	.08210902	.01084255	.05472207	.03989521
	9.34	2.28	4.66	0.30	1.29	2.12
	0.0000	0.0228	0.0000	0.7661	0.1964	0.0343
SDROA	-.28552208	-.00442001	-.04019136	.02022088	.01689811	-.08265984
	-6.25	-0.14	-1.33	0.50	0.43	-2.84
	0.0000	0.8861	0.1838	0.6187	0.6659	0.0046
SIZE	-.00510536	.02006114	.00857566	.00718662	.00490773	-.00038953
	-2.67	5.01	2.99	1.26	0.95	-0.15
	0.0076	0.0000	0.0028	0.2069	0.3442	0.8835
GS	.00002547	.00012884	.00030597	.00264233	.00273909	.00320039
	0.03	0.23	0.56	2.29	1.14	1.83
	0.9793	0.8187	0.5733	0.0222	0.2550	0.0672
$D_{E/M}$	.08808508	0	.06531287			-1.9061999
	1.18	.	0.42			-1.54
	0.2395	.	0.6726			0.1248
DIFF	-.01207261	-.0086398	-.00861577	.00606892	.00335583	.00105307
	-1.67	-2.24	-2.26	1.31	0.57	0.20
	0.0940	0.0251	0.0240	0.1899	0.5705	0.8427
OWNCON	-.00056595	0	-.00039124			-.00055636
	-5.56	.	-1.80			-3.10
	0.0000	.	0.0717			0.0019
LEV_1*_lagged*				.49341646	.40224577	.50679677
				8.55	6.29	9.78
				0.0000	0.0000	0.0000
_cons	.30458515	-.05152947	.1236873			.16003385
	6.85	-0.93	1.57			4.32
	0.0000	0.3537	0.1159			0.0000
F-test		21.84 (0.000)				
Hausman test		-125.64*				
N	7,229					
R-squared	0.1062	0.0081	0.0932			

* Model fitted on these data fails to meet the asymptotic assumptions of Hausman test.

Table 5: Regression results / Total debt / UK

The table presents regression results for total debt in UK (regression coefficients, t –test and p – values). Dependent variable is total debt ratio (LEV_1). Explanatory variables include employees' ownership rights ($D_{E/M}$) employees' entrenchment (*DIFF*), ownership concentration (*OWNCON*), profitability (*ROA*), tangibility of assets (*TANG*), earnings volatility (*SDROA*), firm size (*SIZE*), and firm's growth (*GS*), and lagged value of total debt ratio in dynamic model (LEV_1*_lagged*). All specifications include also industry dummies and year dummies. Besides, F-test, testing for the significance of individual effects, Hausman test, evaluating the significance of FE versus RE estimator, as well as number of observation and adjusted R-squared, are reported.

Variable	OLS	FE	RE	AH	AB	SE
ROA	-.68900249	-.4565674	-.47645964	-.35164792	-.35623323	-.26906541
	-26.70	-21.33	-23.67	-11.87	-6.15	-7.17
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TANG	.06369048	.0164399	.04345886	.01854201	.01536883	.02034397
	5.47	0.84	2.83	0.65	0.43	2.71
	0.0000	0.4027	0.0047	0.5173	0.6694	0.0067
SDROA	.01519345	.00028131	-.00519305	-.09060011	-.1183779	-.1064206
	0.31	0.01	-0.17	-2.20	-1.51	-1.83
	0.7557	0.9929	0.8660	0.0276	0.1309	0.0668
SIZE	.0086224	.03208824	.0143008	.00279092	-.00359382	.00231093
	4.80	5.94	4.55	0.37	-0.46	2.13
	0.0000	0.0000	0.0000	0.7105	0.6466	0.0329
GS	.00007953	.00039688	.00036129	.00459572	.0045905	.01092176
	0.12	1.16	1.06	0.94	0.42	1.06
	0.9047	0.2472	0.2911	0.3496	0.6717	0.2899
$D_{E/M}$	.11475457	0	.11329492			.03457277
	6.39	.	2.86			2.32
	0.0000	.	0.0042			0.0204
DIFF	-.05800862	-.02288276	-.0251154	.00162548	-.00335629	.01261053
	-5.35	-3.87	-4.30	0.23	-0.27	1.18
	0.0000	0.0001	0.0000	0.8195	0.7855	0.2376
OWNCON	.00140011	0	.0014369			.00028153
	18.77	.	9.01			4.03
	0.0000	.	0.0000			0.0001
LEV_1*_lagged*				.67040175	.5713894	.76176273
				11.07	8.23	19.03
				0.0000	0.0000	0.0000
_cons	.24208753	.11391929	.19875673			.06503014
	7.37	1.90	3.23			3.42
	0.0000	0.0570	0.0012			0.0006
F-test		18.68 (0.000)				
Hausman test		-235.22*				
N	33,215					
R-squared	0.2125	0.0454	0.1492			

* Model fitted on these data fails to meet the asymptotic assumptions of Hausman test.

Table 6: Regression results / Total debt / CEB

The table presents regression results for total debt in CEB (regression coefficients, t –test and p – values). Dependent variable is total debt ratio (LEV_1). Explanatory variables include employees' ownership rights ($D_{E/M}$) employees' entrenchment (*DIFF*), ownership concentration (*OWNCON*), profitability (*ROA*), tangibility of assets (*TANG*), earnings volatility (*SDROA*), firm size (*SIZE*), and firm's growth (*GS*), and lagged value of total debt ratio in dynamic model (LEV_1*_lagged*). All specifications include also industry dummies and year dummies. Besides, F-test, testing for the significance of individual effects, Hausman test, evaluating the significance of FE versus RE estimator, as well as number of observation and adjusted R-squared, are reported.

Variable	OLS	FE	RE	AH	AB	SE
ROA	-.44473791	-.35096138	-.37715343	-.268855	-.24020147	-.26723906
	-22.27	-15.97	-19.95	-9.20	-5.47	-8.90
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TANG	-.18983119	-.06062431	-.13640297	-.03221676	-.0569625	-.11919827
	-15.06	-2.75	-8.53	-1.03	-1.40	-6.54
	0.0000	0.0060	0.0000	0.3051	0.1615	0.0000
SDROA	.21095852	-.01616905	.05351748	-.0385563	.00462902	.04328416
	4.37	-0.36	1.32	-0.66	0.07	0.65
	0.0000	0.7186	0.1873	0.5092	0.9439	0.5145
SIZE	-.00890447	.00422548	-.00538723	.00799179	-.00693134	.00069387
	-5.67	0.69	-2.16	1.00	-0.58	0.25
	0.0000	0.4905	0.0305	0.3164	0.5642	0.8055
GS	.0100832	.00052719	.00189086	-.00058568	-.0015081	.0018189
	2.70	0.20	0.75	-0.19	-0.23	0.29
	0.0070	0.8396	0.4517	0.8521	0.8211	0.7727
$D_{E/M}$	-.17878577	0	-.16219186			-.84472846
	-1.74	.	-0.87			-0.16
	0.0817	.	0.3827			0.8759
DIFF	-.02552956	-.01278803	-.01637715	.00475363	.00354569	.00580873
	-3.76	-2.61	-3.50	0.78	0.54	1.00
	0.0002	0.0090	0.0005	0.4341	0.5921	0.3186
OWNCON	-.00034086	0	-.00044465			-.00028077
	-3.54	.	-2.59			-2.19
	0.0004	.	0.0096			0.0285
LEV_1*_lagged*				.52107528	.44579208	.55735531
				9.63	7.13	13.13
				0.0000	0.0000	0.0000
_cons	.45019084	.32511897	.41836035			.22217821
	13.95	4.17	7.82			5.07
	0.0000	0.0000	0.0000			0.0000
F-test		6.56 (0.000)				
Hausman test		63.96 (0.000)				
N	11,752					
R-squared	0.1987	0.0591	0.1952			

Table 7: Regression results / Long-term debt / France

The table presents regression results for long-term debt in France (regression coefficients, t –test and p – values). Dependent variable is long-term debt ratio (LEV_2). Explanatory variables include employees' ownership rights ($D_{E/M}$) employees' entrenchment (*DIFF*), ownership concentration (*OWNCON*), profitability (*ROA*), tangibility of assets (*TANG*), earnings volatility (*SDROA*), firm size (*SIZE*), and firm's growth (*GS*), and lagged value of long-term debt ratio in dynamic model (LEV_2_*lagged*). All specifications include also industry dummies and year dummies. Besides, F-test, testing for the significance of individual effects, Hausman test, evaluating the significance of FE versus RE estimator, as well as number of observation and adjusted R-squared, are reported.

Variable	OLS	FE	RE	AH	AB	SE
ROA	-.04972609	-.04839288	-.05019508	-.05467279	-.04748993	-.02512914
	-7.64	-4.93	-6.44	-4.14	-3.02	-3.93
	0.0000	0.0000	0.0000	0.0000	0.0025	0.0001
TANG	.08648839	.03944598	.07518969	.02942272	.03429917	.04097717
	21.76	4.00	12.73	2.12	1.98	6.72
	0.0000	0.0001	0.0000	0.0342	0.0480	0.0000
SDROA	-.01137992	.02190957	.0113647	.04821258	.04088641	.02284038
	-0.53	0.97	0.56	1.68	1.58	1.23
	0.5951	0.3303	0.5752	0.0922	0.1147	0.2170
SIZE	.01053751	-.00012461	.00790921	.00413757	.00531975	.00518826
	21.53	-0.07	9.97	1.78	1.64	7.55
	0.0000	0.9454	0.0000	0.0749	0.1006	0.0000
GS	8.743e-06	-.00018489	-.00027898	-.00013043	6.146e-06	.00008536
	0.04	-0.95	-1.54	-0.62	0.05	0.74
	0.9691	0.3410	0.1237	0.5355	0.9601	0.4609
$D_{E/M}$	-.00202506	0	-.00177042			.00239872
	-0.13	.	-0.06			0.68
	0.8965	.	0.9535			0.4957
DIFF	-.00271639	-.0006493	-.00068344	.00043658	-.00031954	.00495383
	-0.67	-0.19	-0.22	0.11	-0.07	1.26
	0.5003	0.8458	0.8292	0.9117	0.9476	0.2072
OWNCON	-.00061003	0	-.00056918			-.00036167
	-21.24	.	-11.09			-8.29
	0.0000	.	0.0000			0.0000
LEV_2_*lagged*				.3358104	.3188816	.48349319
				14.20	5.82	12.94
				0.0000	0.0000	0.0000
_cons	-.04929106	.02361238	-.01984934			-.01718266
	-3.29	1.16	-0.84			-2.39
	0.0010	0.2473	0.3987			0.0169
F-test		6.06 (0.000)				
Hausman test		56.59 (0.000)				
N	20,297					
R-squared	0.1120	0.0344	0.1115			

Table 8: Regression results / Long-term debt / Germany

The table presents regression results for long-term debt in Germany (regression coefficients, t –test and p – values). Dependent variable is long-term debt ratio (LEV_2). Explanatory variables include employees' ownership rights ($D_{E/M}$) employees' entrenchment (*DIFF*), ownership concentration (*OWNCON*), profitability (*ROA*), tangibility of assets (*TANG*), earnings volatility (*SDROA*), firm size (*SIZE*), and firm's growth (*GS*), and lagged value of long-term debt ratio in dynamic model (LEV_2_*lagged*). All specifications include also industry dummies and year dummies. Besides, F-test, testing for the significance of individual effects, Hausman test, evaluating the significance of FE versus RE estimator, as well as number of observation and adjusted R-squared, are reported.

Variable	OLS	FE	RE	AH	AB	SE
ROA	-.10766519	-.04648162	-.09387802	-.00712292	-.01339607	-.04571966
	-5.85	-1.47	-4.67	-0.03	-0.20	-1.56
	0.0000	0.1413	0.0000	0.9795	0.8450	0.1194
TANG	.28890674	.12205967	.26341953	.23669926	.16662638	.21452919
	28.33	3.56	19.63	0.67	0.96	2.28
	0.0000	0.0004	0.0000	0.5040	0.3385	0.0225
SDROA	-.20184972	-.0673972	-.13954777	-.03352322	-.04338631	-.09187126
	-4.91	-1.32	-3.67	-0.08	-0.75	-2.43
	0.0000	0.1873	0.0002	0.9354	0.4558	0.0153
SIZE	.00809962	-.01545532	.00390509	-.03954773	-.03979891	.00202792
	5.37	-2.13	1.79	-0.64	-1.81	0.63
	0.0000	0.0330	0.0733	0.5201	0.0707	0.5299
GS	.00199708	.00476585	.00286284	.00566619	.00597178	.00142201
	0.89	2.61	1.72	0.36	1.96	0.44
	0.3754	0.0092	0.0851	0.7206	0.0501	0.6594
$D_{E/M}$	-.02462322	0	-.03037717			.00361784
	-0.32	.	-0.35			0.22
	0.7512	.	0.7288			0.8251
DIFF	-.02086794	-.00235735	-.0130003	.00943192	.00198738	.00239146
	-2.21	-0.29	-1.80	0.13	0.10	0.12
	0.0269	0.7749	0.0712	0.8946	0.9203	0.9009
OWNCON	-.00033053	0	-.00034615			1.091e-06
	-4.10	.	-2.98			0.00
	0.0000	.	0.0029			0.9974
LEV_2_*lagged*				.41944064	.38541868	.49835615
				0.80	4.19	12.81
				0.4225	0.0000	0.0000
_cons	-.04676583	.2979594	.01579153			-.01435659
	-0.63	3.29	0.15			-0.56
	0.5261	0.0010	0.8778			0.5737
F-test		4.99 (0.000)				
Hausman test		40.03 (0.000)				
N	6,434					
R-squared	0.1790	0.0670	0.1804			

Table 9: Regression results / Long-term debt / Sweden

The table presents regression results for long-term debt in Sweden (regression coefficients, t –test and p – values). Dependent variable is long-term debt ratio (LEV_2). Explanatory variables include employees' ownership rights ($D_{E/M}$) employees' entrenchment (*DIFF*), ownership concentration (*OWNCON*), profitability (*ROA*), tangibility of assets (*TANG*), earnings volatility (*SDROA*), firm size (*SIZE*), and firm's growth (*GS*), and lagged value of long-term debt ratio in dynamic model (LEV_2_*lagged*). All specifications include also industry dummies and year dummies. Besides, F-test, testing for the significance of individual effects, Hausman test, evaluating the significance of FE versus RE estimator, as well as number of observation and adjusted R-squared, are reported.

Variable	OLS	FE	RE	AH	AB	SE
ROA	-.06844753	-.07648509	-.06422695	-.01602792	-.025581	-.02942101
	-4.78	-5.55	-5.12	-0.83	-1.65	-3.01
	0.0000	0.0000	0.0000	0.4078	0.0998	0.0026
TANG	.19205633	.06473841	.13089018	.01519999	.04127215	.057854
	21.42	3.38	9.70	0.51	1.23	3.68
	0.0000	0.0007	0.0000	0.6069	0.2187	0.0002
SDROA	-.22162294	-.048641	-.07946637	-.01235634	-.01226474	-.05693559
	-6.56	-1.92	-3.24	-0.36	-0.61	-3.16
	0.0000	0.0544	0.0012	0.7177	0.5420	0.0016
SIZE	-.01036869	.00633463	-.0012144	-.00316837	-.00350207	-.00487747
	-7.34	1.94	-0.56	-0.65	-0.88	-3.11
	0.0000	0.0524	0.5783	0.5136	0.3779	0.0019
GS	.00021002	.00038741	.00045858	.00206713	.00200603	.00186448
	0.29	0.84	1.04	2.26	3.92	5.17
	0.7723	0.4000	0.3001	0.0237	0.0001	0.0000
$D_{E/M}$	.09077233	0	.08464933			.50828976
	1.64	.	0.77			0.57
	0.1012	.	0.4430			0.5669
DIFF	-.00109357	-.00086263	-.00040858	.01044487	.01070612	.01232173
	-0.21	-0.27	-0.13	2.70	2.33	3.12
	0.8374	0.7847	0.8957	0.0068	0.0196	0.0018
OWNCON	-.00041732	0	-.00038669			-.00013524
	-5.55	.	-2.49			-1.13
	0.0000	.	0.0128			0.2572
LEV_2_*lagged*				.60856857	.59137794	.62223528
				14.97	12.54	14.27
				0.0000	0.0000	0.0000
_cons	.2010769	.00112652	.08073226			.09334141
	6.12	0.02	1.41			4.33
	0.0000	0.9801	0.1598			0.0000
F-test		17.12 (0.000)				
Hausman test		34.38 (0.000)				
N	7,229					
R-squared	0.1825	0.0683	0.1698			

Table 10: Regression results /Long-term debt / UK

The table presents regression results for long-term debt in UK (regression coefficients, t –test and p – values). Dependent variable is long-term debt ratio (LEV_2). Explanatory variables include employees' ownership rights ($D_{E/M}$) employees' entrenchment (*DIFF*), ownership concentration (*OWNCON*), profitability (*ROA*), tangibility of assets (*TANG*), earnings volatility (*SDROA*), firm size (*SIZE*), and firm's growth (*GS*), and lagged value of long-term debt ratio in dynamic model (LEV_2_*lagged*). All specifications include also industry dummies and year dummies. Besides, F-test, testing for the significance of individual effects, Hausman test, evaluating the significance of FE versus RE estimator, as well as number of observation and adjusted R-squared, are reported.

Variable	OLS	FE	RE	AH	AB	SE
ROA	-.21390029	-.1474424	-.15287236	-.06144299	.015081	-.015949
	-11.85	-8.95	-9.95	-2.62	0.24	-0.55
	0.0000	0.0000	0.0000	0.0088	0.8069	0.5854
TANG	.19871782	.13880285	.17499005	.15432617	.15642084	.06165425
	24.39	9.21	15.22	6.90	4.62	5.82
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SDROA	-.05650116	.06538224	.03855614	.00402463	.04587026	-.00039438
	-1.65	2.67	1.64	0.12	1.32	-0.02
	0.0987	0.0075	0.1019	0.9007	0.1856	0.9853
SIZE	.01522209	.03249958	.01846443	.01022748	.01246861	.00412774
	12.12	7.87	8.01	1.81	2.06	4.53
	0.0000	0.0000	0.0000	0.0710	0.0398	0.0000
GS	.00011426	.00001077	8.975e-06	.01866504	.0234653	.02524639
	0.24	0.04	0.03	4.95	2.62	3.51
	0.8067	0.9676	0.9729	0.0000	0.0088	0.0004
$D_{E/M}$	.06391177	0	.07320402			.02554173
	5.07	.	2.57			2.14
	0.0000	.	0.0103			0.0326
DIFF	-.01140584	.00025564	-.0005581	.01914592	.03330632	.02776672
	-1.50	0.06	-0.12	3.39	2.48	2.93
	0.1334	0.9553	0.9010	0.0007	0.0133	0.0034
OWNCON	.00036785	0	.00032323			.0000322
	7.05	.	2.82			0.81
	0.0000	.	0.0049			0.4151
LEV_2_*lagged*				.71617702	.70915579	.78131453
				13.27	8.93	19.15
				0.0000	0.0000	0.0000
_cons	-.11599257	-.26257792	-.13580924			-.04631337
	-5.04	-5.74	-3.04			-4.38
	0.0000	0.0000	0.0023			0.0000
F-test		15.56 (0.000)				
Hausman test		165.11 (0.000)				
N	33,215					
R-squared	0.1890	0.0684	0.1842			

Table 11: Regression results / Long-term debt / CEB

The table presents regression results for long-term debt in CEB (regression coefficients, t –test and p – values). Dependent variable is long-term debt ratio (LEV_2). Explanatory variables include employees' ownership rights ($D_{E/M}$) employees' entrenchment (*DIFF*), ownership concentration (*OWNCON*), profitability (*ROA*), tangibility of assets (*TANG*), earnings volatility (*SDROA*), firm size (*SIZE*), and firm's growth (*GS*), and lagged value of long-term debt ratio in dynamic model (LEV_2_*lagged*). All specifications include also industry dummies and year dummies. Besides, F-test, testing for the significance of individual effects, Hausman test, evaluating the significance of FE versus RE estimator, as well as number of observation and adjusted R-squared, are reported.

Variable	OLS	FE	RE	AH	AB	SE
ROA	-.07358353	-.06709077	-.06504344	-.05003606	-.0389082	.18216177
	-6.34	-4.92	-5.69	-2.76	-1.92	2.23
	0.0000	0.0000	0.0000	0.0059	0.0547	0.0260
TANG	.07400672	.0801266	.07551461	.05539862	.04244196	.27339919
	10.09	5.87	7.99	2.82	1.50	2.90
	0.0000	0.0000	0.0000	0.0048	0.1334	0.0037
SDROA	.08057171	-.03016507	.00861892	.02099721	.03453117	.42591118
	2.87	-1.08	0.35	0.58	0.90	2.84
	0.0041	0.2788	0.7272	0.5617	0.3681	0.0045
SIZE	.00043847	-.00114734	.00066285	-.00219436	-.00028583	.04937914
	0.48	-0.30	0.47	-0.43	-0.05	2.80
	0.6303	0.7631	0.6413	0.6678	0.9568	0.0051
GS	.00293868	.00045169	.00084761	.00182767	.00184996	.00135726
	1.35	0.28	0.55	0.93	1.22	1.07
	0.1779	0.7803	0.5845	0.3521	0.2240	0.2834
$D_{E/M}$	-.03845668	0	-.03447308			114.0758
	-0.64	.	-0.33			2.74
	0.5212	.	0.7425			0.0061
DIFF	-.0014908	.00337841	.00237123	.00258161	.00131514	.01251782
	-0.38	1.11	0.83	0.70	0.32	2.48
	0.7048	0.2654	0.4084	0.4836	0.7505	0.0131
OWNCON	.00006417	0	.00002044			-.00177187
	1.15	.	0.21			-2.86
	0.2500	.	0.8309			0.0043
LEV_2_*lagged*				.66083744	.69015612	.77766155
				15.46	9.19	19.65
				0.0000	0.0000	0.0000
_cons	.01238723	.06405912	.03261538			-.67700447
	0.66	1.32	1.07			-2.76
	0.5094	0.1854	0.2837			0.0058
F-test		7.10 (0.000)				
Hausman test		21.14 (0.000)				
N	11,752					
R-squared	0.0417	0.0213	0.0428			

Table 12: Regression results / Total debt with interactive terms / France

The table presents regression results obtained when testing for the difference in the impact trough capital structure determinants in France (regression coefficients, t –test and p – values). Dependent variable is total debt ratio (LEV_1). Explanatory variables include employees' ownership rights ($D_{E/M}$) employees' entrenchment (D_{DIFF}), ownership concentration (*OWNCON*), profitability (*ROA*), tangibility of assets (*TANG*), earnings volatility (*SDROA*), firm size (*SIZE*), and firm's growth (*GS*), interactive terms ($D_{DIF}ROA$, $D_{DIF}TANG$, $D_{DIF}SDROA$) and lagged value of total debt ratio in dynamic model (LEV_1_lagged). All specifications include also industry dummies and year dummies. Besides, F-test, testing for the significance of individual effects, Hausman test, evaluating the significance of FE versus RE estimator, as well as number of observation and adjusted R-squared, are reported.

Variable	OLS	FE	RE	AH	AB	SE
ROA	-.44247939	-.39455195	-.40263833	-.31860286	-.32652661	-.24251109
	-27.49	-23.19	-26.60	-15.08	-11.18	-12.41
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TANG	-.0318711	.00304969	-.01073637	-.00549531	-.00232392	-.02209919
	-3.45	0.19	-0.92	-0.28	-0.08	-2.51
	0.0006	0.8455	0.3575	0.7818	0.9384	0.0119
SDROA	.3623825	.24351696	.26828507	.10512622	.13139946	.01012034
	6.53	5.92	6.82	2.25	1.84	0.11
	0.0000	0.0000	0.0000	0.0242	0.0655	0.9135
SIZE	.02476928	.02682194	.02352761	.02385309	.02652591	.01376042
	24.90	9.51	14.49	7.51	4.52	10.17
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
GS	.00025202	.00064559	.00060295	.00102542	.00107176	.00160006
	0.55	2.14	2.08	3.40	4.84	5.51
	0.5825	0.0321	0.0372	0.0007	0.0000	0.0000
$D_{E/M}$	-.05701255	0	-.06829643			-.00528144
	-1.80	.	-0.99			-0.23
	0.0713	.	0.3206			0.8143
D_{DIFF}	.0062121	-.00556751	-.00478336	-.00203376	-.00180559	.00704379
	1.08	-1.56	-1.36	-0.54	-0.45	1.64
	0.2809	0.1197	0.1741	0.5888	0.6560	0.1016
OWNCON	.00008401	0	.00002252			.00023874
	1.44	.	0.19			4.23
	0.1495	.	0.8458			0.0000
D_{DIFF} *ROA*	-.08118896	-.00651773	-.01281297	.03086188	.05077821	-.00376244
	-2.73	-0.36	-0.71	1.62	2.02	-0.14
	0.0064	0.7210	0.4762	0.1051	0.0431	0.8881
D_{DIFF} *TANG*	-.00568461	.00511562	.00443733	-.0008482	.00347543	.00259977
	-0.33	0.48	0.42	-0.08	0.27	0.19
	0.7431	0.6330	0.6740	0.9392	0.7849	0.8485
D_{DIFF} *SDROA*	-.32765447	-.27136511	-.27043979	-.13614109	-.16472882	-.04005907
	-3.49	-4.51	-4.62	-2.08	-2.05	-0.41
	0.0005	0.0000	0.0000	0.0373	0.0407	0.6807
LEV_1_lagged				.21972271	.23837181	.52934942
				4.49	5.38	19.13
				0.0000	0.0000	0.0000
_cons	.0793969	.0635296	.07112848			-.00290712
	2.61	2.01	1.38			-0.21
	0.0091	0.0449	0.1673			0.8342
F-test		14.50 (0.000)				
Hausman test						
N	20,297					
R-squared	0.1927	0.1037	0.1917			

Table 13: Regression results / Total debt with interactive terms / Germany

The table presents regression results obtained when testing for the difference in the impact trough capital structure determinants in Germany (regression coefficients, t –test and p – values). Dependent variable is total debt ratio (LEV_1). Explanatory variables include employees' ownership rights ($D_{E/M}$) employees' entrenchment (D_{DIFF}), ownership concentration (*OWNCON*), profitability (*ROA*), tangibility of assets (*TANG*), earnings volatility (*SDROA*), firm size (*SIZE*), and firm's growth (*GS*), interactive terms ($D_{DIF}ROA$, $D_{DIF}TANG$, $D_{DIF}SDROA$) and lagged value of total debt ratio in dynamic model (LEV_1_lagged). All specifications include also industry dummies and year dummies. Besides, F-test, testing for the significance of individual effects, Hausman test, evaluating the significance of FE versus RE estimator, as well as number of observation and adjusted R-squared, are reported.

Variable	OLS	FE	RE	AH	AB	SE
ROA	-.16354031	-.2219577	-.20247804	-.25434576	-.2418597	-.0894336
	-5.59	-6.43	-7.81	-5.27	-4.68	-3.34
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0008
TANG	.27045593	.15824875	.23889537	.00495315	.02386962	.05429029
	18.36	5.26	14.09	0.10	0.35	5.19
	0.0000	0.0000	0.0000	0.9234	0.7299	0.0000
SDROA	-.14417474	.0329516	-.00455074	-.01031998	.00665152	-.05472534
	-2.10	0.71	-0.11	-0.16	0.16	-1.53
	0.0358	0.4776	0.9150	0.8708	0.8693	0.1258
SIZE	.01344561	-.00086888	.00869274	-.01449594	-.02051446	.00595639
	7.08	-0.14	3.13	-1.67	-1.01	3.38
	0.0000	0.8893	0.0017	0.0941	0.3149	0.0007
GS	.00582898	.01064608	.00936597	.01159763	.01296175	.00756604
	2.09	6.94	6.48	4.99	4.61	7.02
	0.0367	0.0000	0.0000	0.0000	0.0000	0.0000
$D_{E/M}$	-.08837577	0	-.05617871			-.01816137
	-0.93	.	-0.50			-0.74
	0.3549	.	0.6160			0.4567
D_{DIFF}	.00527131	.0115905	.01135067	.01836084	.01688193	.0105601
	0.42	1.56	1.62	1.88	1.76	1.41
	0.6720	0.1178	0.1050	0.0608	0.0786	0.1582
OWNCON	-.00115268	0	-.00106478			-.00051152
	-11.36	.	-6.79			-5.92
	0.0000	.	0.0000			0.0000
D_{DIFF} *ROA*	.05770689	.02051253	.02659466	.01817194	.02620718	.01801242
	1.15	0.65	0.90	0.44	0.71	0.54
	0.2498	0.5138	0.3656	0.6624	0.4755	0.5895
D_{DIFF} *TANG*	.01688559	-.01289359	-.01186844	-.02097763	-.01884885	-.00026543
	0.65	-0.86	-0.83	-1.08	-1.14	-0.02
	0.5189	0.3872	0.4062	0.2788	0.2539	0.9845
D_{DIFF} *SDROA*	-.17248973	-.29339247	-.26914587	-.30887414	-.30958693	-.06117894
	-1.60	-3.47	-3.85	-2.83	-2.91	-1.07
	0.1106	0.0005	0.0001	0.0047	0.0036	0.2858
LEV_1_lagged				.61535228	.42795453	.6509828
				3.71	3.19	22.46
				0.0002	0.0014	0.0000
_cons	.05473152	.28081075	.15756214			.05075472
	0.60	3.61	1.15			2.19
	0.5471	0.0003	0.2488			0.0285
F-test		13.06 (0.000)				
Hausman test						
N	6,434					
R-squared	0.1766	0.0407	0.1755			

Table 14: Regression results / Total debt with interactive terms / Sweden

The table presents regression results obtained when testing for the difference in the impact trough capital structure determinants in Sweden (regression coefficients, t –test and p – values). Dependent variable is total debt ratio (LEV_1). Explanatory variables include employees' ownership rights ($D_{E/M}$) employees' entrenchment (D_{DIFF}), ownership concentration (*OWNCON*), profitability (*ROA*), tangibility of assets (*TANG*), earnings volatility (*SDROA*), firm size (*SIZE*), and firm's growth (*GS*), interactive terms ($D_{DIF}ROA$, $D_{DIF}TANG$, $D_{DIF}SDROA$) and lagged value of total debt ratio in dynamic model (LEV_1_lagged). All specifications include also industry dummies and year dummies. Besides, F-test, testing for the significance of individual effects, Hausman test, evaluating the significance of FE versus RE estimator, as well as number of observation and adjusted R-squared, are reported.

Variable	OLS	FE	RE	AH	AB	SE
ROA	-.16461538	-.1524352	-.14082098	-.08253143	-.09476447	-.08974411
	-6.54	-7.23	-7.15	-2.93	-2.91	-4.00
	0.0000	0.0000	0.0000	0.0034	0.0036	0.0001
TANG	.11111284	.03631675	.0648295	-.00064657	.04343476	.0305494
	7.84	1.52	3.59	-0.02	1.02	1.62
	0.0000	0.1282	0.0003	0.9860	0.3090	0.1052
SDROA	-.27085308	-.01443318	-.04902888	-.03048729	-.02995134	-.12184561
	-4.23	-0.37	-1.29	-0.62	-0.70	-3.91
	0.0000	0.7123	0.1973	0.5364	0.4839	0.0001
SIZE	-.00504884	.01977305	.00847301	.00756706	.00565459	-.0004632
	-2.64	4.95	2.96	1.33	1.17	-0.17
	0.0084	0.0000	0.0031	0.1830	0.2403	0.8620
GS	-.00005817	.00005782	.00022362	.00193045	.00177596	.00279612
	-0.06	0.10	0.41	1.62	0.91	1.85
	0.9528	0.9186	0.6824	0.1060	0.3628	0.0647
$D_{E/M}$	.09676803	0	.07027455			-1.9352807
	1.29	.	0.45			-1.55
	0.1959	.	0.6494			0.1207
D_{DIFF}	-.02995623	-.02707124	-.02815943	-.0093805	-.01343814	-.01503253
	-2.70	-4.63	-4.84	-1.36	-2.22	-2.62
	0.0069	0.0000	0.0000	0.1750	0.0262	0.0089
OWNCON	-.00055859	0	-.00039249			-.00056021
	-5.48	.	-1.81			-3.09
	0.0000	.	0.0708			0.0020
D_{DIFF} *ROA*	.0481569	.02401542	.02894564	-.01526527	.00521609	.01941666
	1.16	1.03	1.26	-0.54	0.14	0.59
	0.2452	0.3047	0.2072	0.5896	0.8910	0.5549
D_{DIFF} *TANG*	.01375167	.05635996	.05672962	.0309924	.0293452	.03128039
	0.56	4.40	4.45	2.06	2.10	2.10
	0.5727	0.0000	0.0000	0.0399	0.0354	0.0358
D_{DIFF} *SDROA*	.05711461	.05502132	.05966535	.11908463	.12005717	.10139604
	0.61	1.14	1.23	2.04	2.00	1.98
	0.5418	0.2533	0.2171	0.0411	0.0455	0.0475
LEV_1_lagged				.49591081	.40502662	.50466081
				8.61	6.33	9.71
				0.0000	0.0000	0.0000
_cons	.31700761	-.03799408	.13620109			.16634244
	7.08	-0.69	1.73			4.49
	0.0000	0.4934	0.0834			0.0000
F-test		21.86 (0.000)				
Hausman test						
N	7,229					
R-squared	0.1076	0.0094	0.0937			

Table 15: Regression results / Total debt with interactive terms / UK

The table presents regression results obtained when testing for the difference in the impact trough capital structure determinants in UK (regression coefficients, t –test and p – values). Dependent variable is total debt ratio (LEV_1). Explanatory variables include employees' ownership rights ($D_{E/M}$) employees' entrenchment (D_{DIFF}), ownership concentration (*OWNCON*), profitability (*ROA*), tangibility of assets (*TANG*), earnings volatility (*SDROA*), firm size (*SIZE*), and firm's growth (*GS*), interactive terms ($D_{DIF}ROA$, $D_{DIF}TANG$, $D_{DIF}SDROA$) and lagged value of total debt ratio in dynamic model (LEV_1_lagged). All specifications include also industry dummies and year dummies. Besides, F-test, testing for the significance of individual effects, Hausman test, evaluating the significance of FE versus RE estimator, as well as number of observation and adjusted R-squared, are reported.

Variable	OLS	FE	RE	AH	AB	SE
ROA	-.74150658	-.50460247	-.53011677	-.31684742	-.35146481	-.26138889
	-22.83	-19.93	-22.08	-9.19	-5.50	-6.35
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TANG	.06525954	.01700595	.04293327	.01511098	.01097308	.01814076
	5.04	0.85	2.73	0.52	0.31	2.38
	0.0000	0.3940	0.0063	0.6023	0.7585	0.0173
SDROA	.16719904	.05356511	.05884152	-.09591337	-.10702661	-.14123442
	2.80	1.49	1.67	-2.05	-1.18	-1.91
	0.0052	0.1369	0.0941	0.0405	0.2364	0.0557
SIZE	.00892663	.03160605	.01423814	.00212545	-.00451953	.00210817
	4.96	5.86	4.53	0.28	-0.58	1.93
	0.0000	0.0000	0.0000	0.7767	0.5637	0.0539
GS	.00018739	.00044025	.00040891	.00477551	.00399252	.01146677
	0.28	1.29	1.20	0.97	0.37	1.13
	0.7777	0.1986	0.2314	0.3309	0.7090	0.2571
$D_{E/M}$	.11475035	0	.11399415			.03554615
	6.39	.	2.88			2.39
	0.0000	.	0.0040			0.0167
D_{DIFF}	-.00832494	-.00882068	-.0098064	.00976234	.00224245	.00716035
	-0.68	-1.33	-1.49	1.23	0.31	1.05
	0.4981	0.1849	0.1369	0.2169	0.7596	0.2951
OWNCON	.00139791	0	.00143354			.00027413
	18.70	.	9.00			3.91
	0.0000	.	0.0000			0.0001
D_{DIFF} *ROA*	.13824136	.12581748	.13302467	-.00634857	.03522688	.03492258
	2.43	3.98	4.26	-0.17	0.75	0.78
	0.0151	0.0001	0.0000	0.8681	0.4548	0.4369
D_{DIFF} *TANG*	-.00825219	.00069014	.00220282	.00341981	.00875251	.00683224
	-0.35	0.05	0.18	0.23	0.68	0.55
	0.7245	0.9564	0.8602	0.8175	0.4943	0.5840
D_{DIFF} *SDROA*	-.34476802	-.10243146	-.12965553	-.00862627	-.02827526	.09283956
	-3.14	-1.70	-2.19	-0.12	-0.26	0.90
	0.0017	0.0889	0.0287	0.9040	0.7946	0.3702
LEV_1_lagged				.66962732	.56105853	.7617164
				11.04	7.94	18.86
				0.0000	0.0000	0.0000
_cons	.2440837	.12331138	.20490745			.06594182
	7.40	2.06	3.33			3.51
	0.0000	0.0392	0.0009			0.0005
F-test		18.70 (0.000)				
Hausman test						
N	33,215					
R-squared	0.1560	0.0473	0.1500			

Table 16: Regression results / Total debt with interactive terms / CEB

The table presents regression results obtained when testing for the difference in the impact trough capital structure determinants in CEB (regression coefficients, t –test and p – values). Dependent variable is total debt ratio (LEV_1). Explanatory variables include employees' ownership rights ($D_{E/M}$) employees' entrenchment (D_{DIFF}), ownership concentration (*OWNCON*), profitability (*ROA*), tangibility of assets (*TANG*), earnings volatility (*SDROA*), firm size (*SIZE*), and firm's growth (*GS*), interactive terms ($D_{DIF}ROA$, $D_{DIF}TANG$, $D_{DIF}SDROA$) and lagged value of total debt ratio in dynamic model (LEV_1_lagged). All specifications include also industry dummies and year dummies. Besides, F-test, testing for the significance of individual effects, Hausman test, evaluating the significance of FE versus RE estimator, as well as number of observation and adjusted R-squared, are reported.

Variable	OLS	FE	RE	AH	AB	SE
ROA	-.4707725	-.40068463	-.42057851	-.27113459	-.2472945	-.25799529
	-18.61	-15.47	-18.73	-7.79	-5.53	-9.31
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TANG	-.19159878	-.06963692	-.14387548	-.03718142	-.06309528	-.12099158
	-13.32	-3.06	-8.57	-1.15	-1.54	-6.41
	0.0000	0.0022	0.0000	0.2489	0.1237	0.0000
SDROA	.4606918	.13164262	.23149659	-.03363034	.01207893	.03440985
	7.08	2.40	4.61	-0.48	0.16	0.49
	0.0000	0.0162	0.0000	0.6302	0.8703	0.6234
SIZE	-.00879687	.0054909	-.00504693	.00799748	-.00661278	.00062113
	-5.60	0.90	-2.03	1.00	-0.55	0.22
	0.0000	0.3695	0.0423	0.3154	0.5826	0.8257
GS	.01038958	.00064963	.00209831	-.00066799	-.00173509	.0017063
	2.78	0.25	0.84	-0.21	-0.27	0.27
	0.0054	0.8024	0.4024	0.8312	0.7900	0.7847
$D_{E/M}$	-.18014208	0	-.16455805			-.72616932
	-1.76	.	-0.89			-0.13
	0.0789	.	0.3746			0.8930
D_{DIFF}	.01958455	-.01379293	-.00724404	.00057984	-.00809961	.00574464
	1.33	-1.35	-0.73	0.05	-0.52	0.41
	0.1838	0.1777	0.4656	0.9627	0.6000	0.6826
OWNCON	-.00034012	0	-.00045797			-.00028133
	-3.54	.	-2.68			-2.20
	0.0004	.	0.0075			0.0275
D_{DIFF} *ROA*	.03285832	.01367861	.01598087	-.01940012	-.01238923	-.0214433
	0.77	0.46	0.55	-0.53	-0.29	-0.50
	0.4430	0.6486	0.5815	0.5946	0.7726	0.6155
D_{DIFF} *TANG*	.00926182	.02860367	.02464118	.01194537	.01912729	.00713767
	0.37	1.62	1.44	0.56	0.83	0.34
	0.7121	0.1052	0.1497	0.5729	0.4085	0.7302
D_{DIFF} *SDROA*	-.60595184	-.30704376	-.38933846	-.03405905	-.00831347	-.01725136
	-5.98	-4.23	-5.61	-0.37	-0.07	-0.14
	0.0000	0.0000	0.0000	0.7124	0.9433	0.8883
LEV_1_lagged				.52016713	.44595696	.55635113
				9.61	7.14	13.04
				0.0000	0.0000	0.0000
_cons	.44449585	.31598624	.42049909			.22184345
	13.72	4.06	7.88			5.06
	0.0000	0.0000	0.0000			0.0000
F-test		9.56 (0.000)				
Hausman test						
N	11,752					
R-squared	0.2012	0.0582	0.1975			

Appendix 3

Table 17: Regression results / Debt maturity / France
Table 18: Regression results / Debt maturity / Germany
Table 19: Regression results / Debt maturity / Sweden
Table 20: Regression results / Debt maturity / UK
Table 21: Regression results / Debt maturity / CEB
Table 22: Regression results / Debt maturity with the value of the firm's leverage / France
Table 23: Regression results / Debt maturity with the value of the firm's leverage / Germany
Table 24: Regression results / Debt maturity with the value of the firm's leverage / Sweden
Table 25: Regression results / Debt maturity with the value of the firm's leverage / UK
Table 26: Regression results / Debt maturity with the value of the firm's leverage / CEB

Table 17: Regression results / Debt maturity / France

The table presents regression results for debt maturity in France (regression coefficients, t –test and p – values). Dependent variable is debt maturity (*MAT*). Explanatory variables include employees' ownership rights ($D_{E/M}$) employees' entrenchment (*DIFF*), ownership concentration (*OWNCON*), profitability (*ROA*), tangibility of assets (*TANG*), earnings volatility (*SDROA*), firm size (*SIZE*), and firm's growth (*GS*). All specifications include also industry dummies and year dummies. Besides, F-test, testing for the significance of individual effects, Hausman test, evaluating the significance of FE versus RE estimator, as well as number of observation and adjusted R-squared, are reported.

Variable	OLS	FE	RE
ROA	-.02701229	-.05268219	-.04556926
	-2.07	-2.75	-2.96
	0.0388	0.0060	0.0031
TANG	.17711589	.07991628	.15088827
	22.20	4.14	12.85
	0.0000	0.0000	0.0000
SDROA	-.10416136	.02054935	-.02439822
	-2.42	0.47	-0.61
	0.0154	0.6405	0.5407
SIZE	.02508042	-.00254836	.01888691
	25.52	-0.72	11.92
	0.0000	0.4736	0.0000
GS	.00002913	-.00028796	-.00056744
	0.06	-0.76	-1.60
	0.9488	0.4481	0.1106
$D_{E/M}$	.00999049	0	.02675515
	0.32	.	0.44
	0.7493	.	0.6605
DIFF	.00617331	.00018789	.00280227
	0.76	0.03	0.45
	0.4455	0.9770	0.6520
OWNCON	-.00175705	0	-.00165054
	-30.46	.	-16.03
	0.0000	.	0.0000
_cons	-.04494878	.07767993	.02067736
	-1.49	1.95	0.44
	0.1352	0.0515	0.6605
F-test		6.76 (0.000)	
Hausman test		81.71 (0.000)	
N	20,297		
R-squared	0.1750	0.0385	0.1739

Table 18: Regression results / Debt maturity / Germany

The table presents regression results for debt maturity in Germany (regression coefficients, t –test and p – values). Dependent variable is debt maturity (*MAT*). Explanatory variables include employees' ownership rights ($D_{E/M}$) employees' entrenchment (*DIFF*), ownership concentration (*OWNCON*), profitability (*ROA*), tangibility of assets (*TANG*), earnings volatility (*SDROA*), firm size (*SIZE*), and firm's growth (*GS*). All specifications include also industry dummies and year dummies. Besides, F-test, testing for the significance of individual effects, Hausman test, evaluating the significance of FE versus RE estimator, as well as number of observation and adjusted R-squared, are reported.

Variable	OLS	FE	RE
ROA	-.13923322	.02663528	-.10551283
	-3.93	0.45	-2.73
	0.0001	0.6528	0.0063
TANG	.54899117	.12757978	.48855176
	28.34	1.99	18.96
	0.0000	0.0469	0.0000
SDROA	-.43066178	-.04397537	-.26349722
	-5.57	-0.46	-3.67
	0.0000	0.6428	0.0002
SIZE	.01286761	.00730839	.0088155
	4.53	0.54	2.11
	0.0000	0.5895	0.0351
GS	.00245767	.0083587	.00676489
	0.59	2.51	2.22
	0.5552	0.0121	0.0267
$D_{E/M}$	.06911812	0	.04912412
	0.48	.	0.30
	0.6277	.	0.7651
DIFF	-.04713008	-.0132419	-.03793682
	-2.62	-0.85	-2.76
	0.0089	0.3963	0.0058
OWNCON	-.00076522	0	-.00100223
	-5.05	.	-4.49
	0.0000	.	0.0000
_cons	.09753048	.31674951	.17664812
	0.72	1.87	0.91
	0.4720	0.0615	0.3622
F-test		4.98 (0.000)	
Hausman test		65.04 (0.000)	
N	6,434		
R-squared	0.2523	0.1866	0.2531

Table 19: Regression results / Debt maturity / Sweden

The table presents regression results for debt maturity in Sweden (regression coefficients, t –test and p – values). Dependent variable is debt maturity (*MAT*). Explanatory variables include employees' ownership rights ($D_{E/M}$) employees' entrenchment (*DIFF*), ownership concentration (*OWNCON*), profitability (*ROA*), tangibility of assets (*TANG*), earnings volatility (*SDROA*), firm size (*SIZE*), and firm's growth (*GS*). All specifications include also industry dummies and year dummies. Besides, F-test, testing for the significance of individual effects, Hausman test, evaluating the significance of FE versus RE estimator, as well as number of observation and adjusted R-squared, are reported.

Variable	OLS	FE	RE
ROA	-.1515214	-.12822032	-.11483459
	-4.97	-3.86	-3.86
	0.0000	0.0001	0.0001
TANG	.3573178	.0430385	.24148691
	18.69	0.92	7.99
	0.0000	0.3561	0.0000
SDROA	-.52954826	-.09045786	-.18880813
	-7.37	-1.48	-3.22
	0.0000	0.1378	0.0013
SIZE	-.0164865	.00195785	-.00598336
	-5.47	0.25	-1.24
	0.0000	0.8043	0.2168
GS	.00135372	.00067808	.00089122
	0.88	0.61	0.83
	0.3803	0.5410	0.4038
$D_{E/M}$	.23433456	0	.23909779
	1.99	.	1.05
	0.0466	.	0.2942
DIFF	.00080567	.00906717	.00879482
	0.07	1.19	1.16
	0.9435	0.2359	0.2461
OWNCON	-.00127195	0	-.00123155
	-7.93	.	-3.83
	0.0000	.	0.0001
_cons	.46423916	.23164256	.32142239
	6.53	2.11	2.63
	0.0000	0.0347	0.0085
F-test		11.88 (0.000)	
Hausman test		56.56 (0.000)	
N	7,229		
R-squared	0.1890	0.0537	0.1815

Table 20: Regression results / Debt maturity / UK

The table presents regression results for debt maturity in UK (regression coefficients, t –test and p – values). Dependent variable is debt maturity (*MAT*). Explanatory variables include employees' ownership rights ($D_{E/M}$) employees' entrenchment (*DIFF*), ownership concentration (*OWNCON*), profitability (*ROA*), tangibility of assets (*TANG*), earnings volatility (*SDROA*), firm size (*SIZE*), and firm's growth (*GS*). All specifications include also industry dummies and year dummies. Besides, F-test, testing for the significance of individual effects, Hausman test, evaluating the significance of FE versus RE estimator, as well as number of observation and adjusted R-squared, are reported.

Variable	OLS	FE	RE
ROA	-.15478079	-.09705773	-.1027999
	-5.03	-3.25	-3.76
	0.0000	0.0012	0.0002
TANG	.40720558	.20837296	.32191788
	29.25	7.60	16.45
	0.0000	0.0000	0.0000
SDROA	-.15426824	.06266736	.00464451
	-2.65	1.42	0.11
	0.0081	0.1570	0.9127
SIZE	.03429381	.05837266	.03603691
	15.99	7.74	9.57
	0.0000	0.0000	0.0000
GS	.00006254	-.00061417	-.00058603
	0.08	-1.28	-1.23
	0.9371	0.1992	0.2200
$D_{E/M}$	.0616805	0	.0851518
	2.88	.	1.92
	0.0040	.	0.0551
DIFF	-.01107095	.00094042	-.00078507
	-0.86	0.11	-0.10
	0.3916	0.9093	0.9229
OWNCON	-.0002055	0	-.00029781
	-2.31	.	-1.66
	0.0210	.	0.0963
_cons	-.1938472	-.4272959	-.17890911
	-4.95	-5.11	-2.52
	0.0000	0.0000	0.0116
F-test		13.26 (0.000)	
Hausman test		43.71 (0.000)	
N	33,215		
R-squared	0.2281	0.0804	0.2231

Table 21: Regression results / Debt maturity / CEB

The table presents regression results for debt maturity in CEB (regression coefficients, t –test and p – values). Dependent variable is debt maturity (*MAT*). Explanatory variables include employees' ownership rights ($D_{E/M}$) employees' entrenchment (*DIFF*), ownership concentration (*OWNCON*), profitability (*ROA*), tangibility of assets (*TANG*), earnings volatility (*SDROA*), firm size (*SIZE*), and firm's growth (*GS*). All specifications include also industry dummies and year dummies. Besides, F-test, testing for the significance of individual effects, Hausman test, evaluating the significance of FE versus RE estimator, as well as number of observation and adjusted R-squared, are reported.

Variable	OLS	FE	RE
ROA	.0493771	.06133204	.04044366
	1.88	1.74	1.47
	0.0606	0.0826	0.1415
TANG	.34675291	.2421909	.31437219
	20.86	6.80	14.71
	0.0000	0.0000	0.0000
SDROA	-.0267124	-.13514742	-.0723622
	-0.42	-1.88	-1.20
	0.6764	0.0599	0.2320
SIZE	.01738171	-.02642793	.01291316
	8.46	-2.70	4.31
	0.0000	0.0070	0.0000
GS	.00084351	.00344228	.00129419
	0.17	0.84	0.33
	0.8630	0.4029	0.7394
$D_{E/M}$	-.12389179	0	-.11671682
	-0.93	.	-0.56
	0.3535	.	0.5764
DIFF	.00659895	.00981907	.00678609
	0.74	1.25	0.93
	0.4608	0.2113	0.3504
OWNCON	-.00009052	0	-.00006238
	-0.71	.	-0.32
	0.4749	.	0.7518
_cons	-.09455865	.42927839	.00395371
	-2.24	3.45	0.06
	0.0254	0.0006	0.9495
F-test		4.83 (0.000)	
Hausman test		37.63 (0.000)	
N	11,752		
R-squared	0.0948	0.0329	0.0963

Table 22: Regression results / Debt maturity with the value of the firm's leverage / France

The table presents regression results for debt maturity in France (regression coefficients, t –test and p – values). Dependent variable is debt maturity (*MAT*). Explanatory variables include employees' ownership rights ($D_{E/M}$) employees' entrenchment (*DIFF*), ownership concentration (*OWNCON*), profitability (*ROA*), tangibility of assets (*TANG*), earnings volatility (*SDROA*), firm size (*SIZE*), firm's growth (*GS*), and the value of firm's leverage (LEV_1). All specifications include also industry dummies and year dummies. Besides, F-test, testing for the significance of individual effects, Hausman test, evaluating the significance of FE versus RE estimator, as well as number of observation and adjusted R-squared, are reported.

Variable	OLS	FE	RE
ROA	.07225888	.11619064	.0941487
	5.47	6.33	6.21
	0.0000	0.0000	0.0000
TANG	.18435235	.07783348	.15366922
	23.66	4.31	13.42
	0.0000	0.0000	0.0000
SDROA	-.15594001	-.02828816	-.0754048
	-3.71	-0.69	-1.99
	0.0002	0.4920	0.0470
SIZE	.01983592	-.01443528	.01037302
	20.32	-4.33	6.60
	0.0000	0.0000	0.0000
GS	-.00001644	-.00056789	-.00075832
	-0.04	-1.60	-2.25
	0.9704	0.1098	0.0245
$D_{E/M}$	.02285427	0	.05156973
	0.75	.	0.85
	0.4540	.	0.3954
DIFF	.01510939	.01624185	.01586028
	1.91	2.66	2.69
	0.0560	0.0079	0.0071
OWNCON	-.00177544	0	-.00165912
	-31.53	.	-16.19
	0.0000	.	0.0000
LEV_1	.21440322	.44582236	.3492604
	29.11	44.18	41.56
	0.0000	0.0000	0.0000
_cons	-.06349957	.04927863	-.00117326
	-2.16	1.32	-0.03
	0.0307	0.1867	0.9799
F-test		7.93 (0.000)	
Hausman test		372.03 (0.000)	
N	20,297		
R-squared	0.2137	0.0382	0.1967

Table 23: Regression results / Debt maturity with the value of the firm's leverage / Germany

The table presents regression results for debt maturity in Germany (regression coefficients, t –test and p – values). Dependent variable is debt maturity (*MAT*). Explanatory variables include employees' ownership rights ($D_{E/M}$) employees' entrenchment (*DIFF*), ownership concentration (*OWNCON*), profitability (*ROA*), tangibility of assets (*TANG*), earnings volatility (*SDROA*), firm size (*SIZE*), firm's growth (*GS*), and the value of firm's leverage (LEV_1). All specifications include also industry dummies and year dummies. Besides, F-test, testing for the significance of individual effects, Hausman test, evaluating the significance of FE versus RE estimator, as well as number of observation and adjusted R-squared, are reported.

Variable	OLS	FE	RE
ROA	-.06678592	.17361805	.00112562
	-2.00	3.22	0.03
	0.0451	0.0013	0.9752
TANG	.40577608	-.02357363	.31591536
	21.43	-0.40	12.66
	0.0000	0.6864	0.0000
SDROA	-.31443202	-.01842901	-.17179265
	-4.34	-0.21	-2.58
	0.0000	0.8300	0.0099
SIZE	.00602526	.00947316	.00215914
	2.26	0.77	0.54
	0.0242	0.4397	0.5859
GS	-.00053036	-.00157999	.0010313
	-0.14	-0.52	0.37
	0.8920	0.6032	0.7130
$D_{E/M}$	.11441873	0	.08908932
	0.86	.	0.57
	0.3917	.	0.5664
DIFF	-.04296568	-.01088448	-.0329861
	-2.55	-0.77	-2.61
	0.0109	0.4411	0.0090
OWNCON	-.00017429	0	-.00031427
	-1.21	.	-1.47
	0.2257	.	0.1404
LEV_1	.52219591	.92675426	.66303398
	26.62	25.49	28.96
	0.0000	0.0000	0.0000
_cons	.06674127	.04498207	.09146206
	0.53	0.29	0.50
	0.5994	0.7697	0.6192
F-test		5.62 (0.000)	
Hausman test		137.60 (0.000)	
N	6,434		
R-squared	0.3436	0.1230	0.3380

Table 24: Regression results / Debt maturity with the value of the firm's leverage / Sweden

The table presents regression results for debt maturity in Sweden (regression coefficients, t –test and p – values). Dependent variable is debt maturity (*MAT*). Explanatory variables include employees' ownership rights ($D_{E/M}$) employees' entrenchment (*DIFF*), ownership concentration (*OWNCON*), profitability (*ROA*), tangibility of assets (*TANG*), earnings volatility (*SDROA*), firm size (*SIZE*), firm's growth (*GS*), and the value of firm's leverage (LEV_1). All specifications include also industry dummies and year dummies. Besides, F-test, testing for the significance of individual effects, Hausman test, evaluating the significance of FE versus RE estimator, as well as number of observation and adjusted R-squared, are reported.

Variable	OLS	FE	RE
ROA	-.01626408	.01680701	.00979485
	-0.67	0.59	0.39
	0.5021	0.5564	0.6952
TANG	.24589509	-.01273053	.15955734
	16.11	-0.32	6.49
	0.0000	0.7488	0.0000
SDROA	-.25313771	-.08446705	-.12692095
	-4.44	-1.63	-2.57
	0.0000	0.1038	0.0102
SIZE	-.01225342	-.01905484	-.01145629
	-5.14	-2.82	-2.93
	0.0000	0.0048	0.0034
GS	.00133621	.00055161	.00058339
	1.10	0.58	0.65
	0.2732	0.5593	0.5176
$D_{E/M}$	.1536057	0	.16554678
	1.65	.	0.92
	0.0988	.	0.3552
DIFF	.01268463	.01801107	.01743672
	1.41	2.76	2.72
	0.1585	0.0058	0.0066
OWNCON	-.000716	0	-.00080111
	-5.63	.	-3.17
	0.0000	.	0.0015
LEV_1	.96512935	1.0372891	1.0140491
	51.77	37.52	43.74
	0.0000	0.0000	0.0000
_cons	.16582607	.28732224	.14656775
	2.94	3.08	1.51
	0.0033	0.0021	0.1316
F-test		9.44 (0.000)	
Hausman test		38.93 (0.000)	
N	7,229		
R-squared	0.4935	0.4022	0.4907

Table 25: Regression results / Debt maturity with the value of the firm's leverage / UK

The table presents regression results for debt maturity in UK (regression coefficients, t –test and p – values). Dependent variable is debt maturity (*MAT*). Explanatory variables include employees' ownership rights ($D_{E/M}$) employees' entrenchment (*DIFF*), ownership concentration (*OWNCON*), profitability (*ROA*), tangibility of assets (*TANG*), earnings volatility (*SDROA*), firm size (*SIZE*), firm's growth (*GS*), and the value of firm's leverage (LEV_1). All specifications include also industry dummies and year dummies. Besides, F-test, testing for the significance of individual effects, Hausman test, evaluating the significance of FE versus RE estimator, as well as number of observation and adjusted R-squared, are reported.

Variable	OLS	FE	RE
ROA	.0350163	.03481099	.04261563
	1.12	1.15	1.54
	0.2642	0.2514	0.1242
TANG	.39009774	.20374996	.30901788
	28.73	7.59	16.25
	0.0000	0.0000	0.0000
SDROA	-.15728933	.06273531	.0049579
	-2.77	1.45	0.12
	0.0056	0.1479	0.9047
SIZE	.03200518	.04936494	.03244701
	15.31	6.67	8.90
	0.0000	0.0000	0.0000
GS	.00004439	-.0007262	-.0006862
	0.06	-1.55	-1.47
	0.9541	0.1211	0.1421
$D_{E/M}$	.03049472	0	.05195626
	1.46	.	1.21
	0.1444	.	0.2248
DIFF	.00497389	.00762237	.00723991
	0.39	0.94	0.91
	0.6931	0.3463	0.3619
OWNCON	-.00059065	0	-.00072481
	-6.66	.	-4.17
	0.0000	.	0.0000
LEV_1	.2741362	.28727451	.29548599
	20.50	16.22	19.76
	0.0000	0.0000	0.0000
_cons	-.26124258	-.46258373	-.24395463
	-6.82	-5.65	-3.56
	0.0000	0.0000	0.0004
F-test		13.15 (0.000)	
Hausman test		-267.11*	
N	33,215		
R-squared	0.2686	0.1349	0.2646

* Model fitted on these data fails to meet the asymptotic assumptions of Hausman test.

Table 26: Regression results / Debt maturity with the value of the firm's leverage / CEB

The table presents regression results for debt maturity in CEB (regression coefficients, t –test and p – values). Dependent variable is debt maturity (*MAT*). Explanatory variables include employees' ownership rights ($D_{E/M}$) employees' entrenchment (*DIFF*), ownership concentration (*OWNCON*), profitability (*ROA*), tangibility of assets (*TANG*), earnings volatility (*SDROA*), firm size (*SIZE*), firm's growth (*GS*), and the value of firm's leverage (LEV_1). All specifications include also industry dummies and year dummies. Besides, F-test, testing for the significance of individual effects, Hausman test, evaluating the significance of FE versus RE estimator, as well as number of observation and adjusted R-squared, are reported.

Variable	OLS	FE	RE
ROA	.13859883	.12517763	.11867901
	5.13	3.47	4.22
	0.0000	0.0005	0.0000
TANG	.38625184	.25400025	.34783966
	23.05	7.17	16.34
	0.0000	0.0000	0.0000
SDROA	-.073123	-.1364333	-.09348262
	-1.15	-1.91	-1.56
	0.2489	0.0561	0.1195
SIZE	.01893695	-.02645096	.01426399
	9.30	-2.72	4.85
	0.0000	0.0066	0.0000
GS	-.00125831	.00316488	.00056082
	-0.26	0.77	0.15
	0.7949	0.4393	0.8847
$D_{E/M}$	-.08869733	0	-.08404131
	-0.67	.	-0.41
	0.5019	.	0.6815
DIFF	.01181575	.01260978	.01072988
	1.33	1.61	1.48
	0.1824	0.1068	0.1377
OWNCON	-.00002171	0	.00001443
	-0.17	.	0.07
	0.8626	.	0.9406
LEV_1	.19498944	.17504052	.19212301
	12.19	7.57	10.95
	0.0000	0.0000	0.0000
_cons	-.18540654	.3600286	-.08432901
	-4.36	2.90	-1.36
	0.0000	0.0038	0.1725
F-test		4.80 (0.000)	
Hausman test		44.77 (0.000)	
N	11,752		
R-squared	0.1144	0.0395	0.1158

Appendix 4

Table 27: Regression results / Cost of debt / France
Table 28: Regression results / Cost of debt / Germany
Table 29: Regression results / Cost of debt / Sweden
Table 30: Regression results / Cost of debt / UK
Table 31: Regression results / Cost of debt / CEB

Table 27: Regression results / Cost of debt / France

The table presents regression results for cost of debt in France (regression coefficients, t –test and p – values). Dependent variable is cost of debt (*COST*). Explanatory variables include employees' ownership rights ($D_{E/M}$) employees' entrenchment (*DIFF*), ownership concentration (*OWNCON*), profitability (*ROA*), tangibility of assets (*TANG*), earnings volatility (*SDROA*), firm size (*SIZE*), firm's growth (*GS*), and the value of firm's leverage (LEV_1). All specifications include also industry dummies and year dummies. Besides, F-test, testing for the significance of individual effects, Hausman test, evaluating the significance of FE versus RE estimator, as well as number of observation and adjusted R-squared, are reported.

Variable	OLS	FE	RE
ROA	-.26216709	-.29415132	-.33252756
	-2.75	-1.53	-2.82
	0.0061	0.1256	0.0049
TANG	.03992912	-.23630357	.01069041
	0.72	-1.28	0.14
	0.4711	0.2012	0.8864
SDROA	-.22652528	-.25339549	-.34801002
	-0.75	-0.59	-1.04
	0.4539	0.5543	0.2986
SIZE	.00182985	-.25463148	-.01236764
	0.26	-7.38	-1.28
	0.7930	0.0000	0.1997
GS	-.00071362	.00458797	-.00054413
	-0.23	1.29	-0.18
	0.8172	0.1980	0.8600
$D_{E/M}$	-.05078583	0	-.05950109
	-0.24	.	-0.18
	0.8114	.	0.8546
DIFF	-.13881755	-.19999423	-.16432917
	-2.48	-3.20	-2.96
	0.0133	0.0014	0.0031
OWNCON	.00046869	0	.00043151
	1.17	.	0.76
	0.2405	.	0.4497
LEV_1	-.39954225	-.61858405	-.47499467
	-7.61	-6.02	-7.33
	0.0000	0.0000	0.0000
_cons	.15630328	3.2246887	.33872149
	0.76	8.34	1.24
	0.4477	0.0000	0.2157
F-test		1.60 (0.000)	
Hausman test		70.42 (0.000)	
N	20,297		
R-squared	0.0030	0.005	0.0043

Table 28: Regression results / Cost of debt / Germany

The table presents regression results for cost of debt in Germany (regression coefficients, t –test and p – values). Dependent variable is cost of debt (*COST*). Explanatory variables include employees' ownership rights ($D_{E/M}$) employees' entrenchment (*DIFF*), ownership concentration (*OWNCON*), profitability (*ROA*), tangibility of assets (*TANG*), earnings volatility (*SDROA*), firm size (*SIZE*), firm's growth (*GS*), and the value of firm's leverage (LEV_1). All specifications include also industry dummies and year dummies. Besides, F-test, testing for the significance of individual effects, Hausman test, evaluating the significance of FE versus RE estimator, as well as number of observation and adjusted R-squared, are reported.

Variable	OLS	FE	RE
ROA	-.07066653	-.1755767	-.14433519
	-0.89	-1.69	-1.69
	0.3724	0.0918	0.0913
TANG	-.13086033	-.15858348	-.16655075
	-2.88	-1.41	-2.40
	0.0040	0.1600	0.0163
SDROA	-.17593579	.05504545	-.01770486
	-0.99	0.31	-0.11
	0.3204	0.7571	0.9093
SIZE	-.00507683	-.0621745	-.02101616
	-0.80	-2.34	-1.74
	0.4265	0.0194	0.0819
GS	-.00183243	.0011202	-.00202117
	-0.20	0.19	-0.38
	0.8414	0.8461	0.7072
$D_{E/M}$	-.11903885	0	-.15399927
	-0.38	.	-0.32
	0.7035	.	0.7459
DIFF	.1301747	-.05190112	-.01978936
	3.25	-1.92	-0.78
	0.0012	0.0548	0.4351
OWNCON	.0008359	0	.00097629
	2.45	.	1.43
	0.0145	.	0.1520
LEV_1	-.29648591	-.36508338	-.36278924
	-6.35	-5.26	-6.54
	0.0000	0.0000	0.0000
_cons	.23665945	1.0324544	.47957813
	0.78	3.09	0.82
	0.4339	0.0020	0.4128
F-test		8.96 (0.000)	
Hausman test		34.22 (0.000)	
N	6,434		
R-squared	0.0154	0.0071	0.0165

Table 29: Regression results / Cost of debt / Sweden

The table presents regression results for cost of debt in Sweden (regression coefficients, t –test and p – values). Dependent variable is cost of debt (*COST*). Explanatory variables include employees' ownership rights ($D_{E/M}$) employees' entrenchment (*DIFF*), ownership concentration (*OWNCON*), profitability (*ROA*), tangibility of assets (*TANG*), earnings volatility (*SDROA*), firm size (*SIZE*), firm's growth (*GS*), and the value of firm's leverage (LEV_1). All specifications include also industry dummies and year dummies. Besides, F-test, testing for the significance of individual effects, Hausman test, evaluating the significance of FE versus RE estimator, as well as number of observation and adjusted R-squared, are reported.

Variable	OLS	FE	RE
ROA	-.36520983	-.24726821	-.36488033
	-1.88	-0.73	-1.86
	0.0608	0.4649	0.0629
TANG	.11124748	-.1682574	.10877737
	0.90	-0.36	0.87
	0.3664	0.7198	0.3836
SDROA	-1.3363895	-.95885536	-1.3344291
	-2.83	-1.56	-2.82
	0.0046	0.1184	0.0048
SIZE	-.04409799	-.27464228	-.04550871
	-2.29	-3.44	-2.33
	0.0220	0.0006	0.0197
GS	-.00328432	-.11428985	-.00602337
	-0.31	-9.54	-0.58
	0.7535	0.0000	0.5641
$D_{E/M}$	.1458784	0	.15097398
	0.20	.	0.20
	0.8440	.	0.8406
DIFF	-.0512952	-.02775367	-.04995431
	-0.71	-0.36	-0.69
	0.4769	0.7175	0.4878
OWNCON	.00110136	0	.00109392
	1.07	.	1.05
	0.2825	.	0.2929
LEV_1	-.88227884	-1.0760445	-.88544868
	-5.87	-3.24	-5.82
	0.0000	0.0012	0.0000
_cons	.80478714	4.3589792	.82808005
	1.73	3.95	1.76
	0.0840	0.0001	0.0789
F-test		1.74 (0.000)	
Hausman test		612.53 (0.000)	
N	7,229		
R-squared	0.0110	0.0042	0.0171

Table 30: Regression results / Cost of debt / UK

The table presents regression results for cost of debt in UK (regression coefficients, t –test and p – values). Dependent variable is cost of debt (*COST*). Explanatory variables include employees' ownership rights ($D_{E/M}$) employees' entrenchment (*DIFF*), ownership concentration (*OWNCON*), profitability (*ROA*), tangibility of assets (*TANG*), earnings volatility (*SDROA*), firm size (*SIZE*), firm's growth (*GS*), and the value of firm's leverage (LEV_1). All specifications include also industry dummies and year dummies. Besides, F-test, testing for the significance of individual effects, Hausman test, evaluating the significance of FE versus RE estimator, as well as number of observation and adjusted R-squared, are reported.

Variable	OLS	FE	RE
ROA	-.01770723	-.03037364	-.01999497
	-1.11	-1.21	-1.11
	0.2677	0.2276	0.2658
TANG	.01204769	.01727443	.01445042
	1.77	0.78	1.62
	0.0764	0.4374	0.1051
SDROA	.11054193	.04809228	.11653828
	3.50	1.18	3.55
	0.0005	0.2376	0.0004
SIZE	.00290378	-.00262169	.00273438
	2.78	-0.42	1.89
	0.0054	0.6713	0.0588
GS	-.00021487	-.00014428	-.00019969
	-0.57	-0.39	-0.56
	0.5677	0.6984	0.5759
$D_{E/M}$	.00144211	0	.0035744
	0.14	.	0.24
	0.8908	.	0.8115
DIFF	-.00518461	.00741001	-.00123634
	-0.83	1.12	-0.21
	0.4087	0.2634	0.8371
OWNCON	1.705e-06	0	6.247e-06
	0.04	.	0.10
	0.9696	.	0.9206
LEV_1	-.06866199	-.13623171	-.07838895
	-10.01	-9.14	-9.31
	0.0000	0.0000	0.0000
_cons	.03533646	.12686946	.03920234
	1.85	1.86	1.50
	0.0637	0.0634	0.1344
F-test		2.07 (0.000)	
Hausman test		53.23 (0.000)	
N	33,215		
R-squared	0.0294	0.0194	0.0330

Table 31: Regression results / Cost of debt / CEB

The table presents regression results for cost of debt in CEB (regression coefficients, t –test and p – values). Dependent variable is cost of debt (*COST*). Explanatory variables include employees' ownership rights ($D_{E/M}$) employees' entrenchment (*DIFF*), ownership concentration (*OWNCON*), profitability (*ROA*), tangibility of assets (*TANG*), earnings volatility (*SDROA*), firm size (*SIZE*), firm's growth (*GS*), and the value of firm's leverage (LEV_1). All specifications include also industry dummies and year dummies. Besides, F-test, testing for the significance of individual effects, Hausman test, evaluating the significance of FE versus RE estimator, as well as number of observation and adjusted R-squared, are reported.

Variable	OLS	FE	RE
ROA	-.35802953	-.2670451	-.35802953
	-1.42	-0.54	-1.42
	0.1559	0.5904	0.1558
TANG	-.19436456	-.41921965	-.19436456
	-1.24	-0.87	-1.24
	0.2144	0.3854	0.2143
SDROA	.84601185	-1.5769554	.84601185
	1.43	-1.68	1.43
	0.1529	0.0931	0.1529
SIZE	-.02202919	.00180068	-.02202919
	-1.19	0.01	-1.19
	0.2357	0.9894	0.2356
GS	-.01080793	-.01081441	-.01080793
	-0.24	-0.20	-0.24
	0.8135	0.8382	0.8135
$D_{E/M}$	-.15402244	0	-.15402244
	-0.14	.	-0.14
	0.8885	.	0.8885
DIFF	.01577724	.16263712	.01577724
	0.20	1.64	0.20
	0.8419	0.1013	0.8419
OWNCON	.00100487	0	.00100487
	0.87	.	0.87
	0.3856	.	0.3856
LEV_1	-.42921163	-.41325571	-.42921163
	-2.85	-1.26	-2.85
	0.0043	0.2061	0.0043
_cons	.41908543	.56810414	.41908543
	1.09	0.33	1.09
	0.2774	0.7384	0.2773
F-test		1.16 (0.000)	
Hausman test		28.73 (0.000)	
N	11,752		
R-squared	0.0004	0.0006	0.0054

Deležniško proti delničarsko usmerjenemu podjetju in struktura kapitala

Povzetek

V doktorski disertaciji raziskujem odločitve o strukturi kapitala v deležniško-orientiranemu podjetju oziroma podjetjih, v katerih vladajo zaposleni in managerji. Odločitve o strukturi kapitala so danes eno najbolj raziskovanih področij v poslovnih financah. Moderna teorija strukture kapitala, ki je bila razvita v zadnjih petdesetih letih, je predlagala različne faktorje, ki naj bi pojasnili strukturo kapitala. Modigliani in Miller (1963) v enem izmed prvih prispevkov na tem področju ugotavljata, da se podjetja odločajo za uporabo dolga zaradi davčnega ščita, ki ga predstavlja dolg. Kasneje gre raziskovanje v smeri ugotavljanja, zakaj podjetja niso v celoti financirana z dolgom, saj so takrat koristi iz davčnega ščita največje. Modigliani in Miller (1963) npr. menita, da podjetja vzdržujejo sposobnost zadolževanja in da se inkrementalni davčni učinek dolga zmanjšuje, ker realizacija le-tega s povečevanjem zadolženosti postaja vse manj gotova. Miller (1977) upošteva osebne davke, DeAngelo in Masulis (1980) pa davčne ščite, ki ne izhajajo iz dolga, kot je npr. amortizacija. Novejša literatura se osredotoča na stroške agentov in njih izvirajoče učinke (Jensen in Meckling, 1976) ter asimetrične informacije (Myers, 1984). Danes moderno teorijo strukture kapitala sestavljata dve konkurenčni teoriji: teorija tehtanja in teorija vrstnega reda. Teorija tehtanja predpostavlja, da ima vsako podjetje optimalno strukturo kapitala, pri kateri so stroški kapitala podjetja najnižji in vrednost podjetja največja. Optimalna struktura kapitala je določena s tehtanjem koristi, ki izhajajo iz financiranja z dolgom, kot so npr. davčni učinki in sposobnost dolga pri zmanjševanju stroškov agentov, in stroškov dolga, kot so npr. stroški stečaja in stroški agentov, do katerih prihaja s povečevanjem zadolženosti. Po teoriji vrstnega reda optimalna struktura kapitala ne obstaja. Financiranje podjetja zaradi asimetrije informacij poteka po vrstnem redu, tako da podjetja najprej porabijo vse notranje vire, šele nato posežejo po zunanjih virih financiranja, pri tem pa se najprej odločijo za dolg in šele nazadnje za lastniški kapital.

Vendar empirične raziskave kažejo, da z moderno teorijo ne moremo zadovoljivo pojasniti odločitev o strukturi kapitala podjetij. Empirične raziskave sicer pokažejo na značilen vpliv davkov (Mackie-Mason, 1991; Graham, 1996; Masulis, 1980; Kemsley in Nissim, 2002), stroškov stečaja (Warner, 1977; Altman, 1984; Opler in Titman, 1994; Bradley et al., 1984), stroškov agentov (Long in Malitz, 1985) in tendence k gibanju zadolženosti proti optimalni strukturi kapitala (Taggert, 1977; Marsh, 1982; Auerbach, 1985; Julilvand in Harris, 1984; Opler in Titman, 1994; Hovakimian et al., 2001; Flannery in Rangan, 2006). Po drugi strani nekatere raziskave govorijo v prid teorije vrstnega reda (Shyam-Sunder in Myers, 1999; Bharath et al., 2008). Spet tretji ugotavljajo, da je ključni vpliv donosnost delnice oziroma gibanje njihovih cen

(Welch, 2004). Moderna teorija pa ni sposobna razložiti relativno nizke zadolženosti podjetij. Poleg tega s predlaganimi faktorji pojasni relativno majhen delež razlik v zadolženosti med podjetji. Lemmon in Zender (2001) ugotavljata, da podjetja sprejemajo odločitve o strukturi kapitala zelo konservativno in da je za strukturo kapitala značilna izredna stabilnost v času. Lemmon et al. (2006) pokažejo, da je le malo razlik v zadolženosti mogoče pojasniti s predlaganimi faktorji in da večino razlik v zadolženosti med podjetji pojasni neopazovani učinek, ki se s časom ne spreminja. Nekaj torej mora biti narobe z moderno teorijo strukture kapitala.

Moderna teorija strukture kapitala predpostavlja, da v podjetjih vladajo lastniki in da je cilj poslovanja podjetja maksimizacija tržne vrednosti podjetja in s tem njihovega premoženja. Če bi to bilo res, potem bi podjetja izbrala tako strukturo kapitala, kot jo predlaga teorija. Moja hipoteza je, da so podjetja bistveno manj zadolžena kot predlaga moderna teorija strukture kapitala, zato ker v podjetjih na splošno ne vladajo izključno lastniki in je moderna teorija strukture kapitala zgrajena na napačni predpostavki o cilju poslovanja podjetja. Vse bolj jasno postaja, da na poslovanje podjetja vplivajo tudi ostali deležniki v podjetju, kot so zaposleni in managerji. Zato pogosto cilj poslovanja podjetja odstopa od koncepta vrednosti za delničarje. Menim, da je za razvoj teorije strukture kapitala, ki bo sposobna pojasniti odločitve o strukturi kapitala, potrebno ponovno preučiti korporativno upravljanje, se najprej vprašati, kaj sploh je podjetje, kateri deležniki vladajo v podjetju, kakšni so njihovi cilji in kaj je cilj poslovanja podjetja.

Deležniško-orientirano podjetje

Po pregledu sistemov korporativnega upravljanja po svetu ugotavljam, da na obnašanje podjetij v številnih državah vplivajo poleg lastnikov tudi drugi deležniki. V Nemčiji npr. zakonodaja jasno določa, da podjetja nimajo poslanstva zasledovati izključno interese njihovih lastnikov. Tako imenovani sistem soupravljanja omogoča zaposlenim aktivno vključevanje v procese odločanja, tako na nižjih ravneh v okviru delavskih svetov kot tudi v upravnih odborih in nadzornih svetih. Nemčija seveda ni edina država, kjer ostali deležniki poleg lastnikov vplivajo na obnašanje podjetij oziroma kjer lahko pri cilju poslovanja podjetja zasledimo odstopanje od koncepta vrednosti za delničarje. Odstopanje od obstoječe paradigme korporativnega upravljana opažam tudi na Japonskem, večini evropskih držav in nenazadnje tudi v Združenih državah Amerike.

Zavedajoč se dejstva, da v podjetjih lahko vladajo tudi zaposleni in managerji, ponovno analiziram teorijo podjetja. Poiščem teorijo, ki v nasprotju z obstoječo teorijo v podjetje pripelje poleg lastnikov tudi ostale deležnike. Tako imenovana nova teorija podjetja identificira alternativne vire moči in bistveno drugače definira podjetje. V skladu z uveljavljeno neoklasično teorijo podjetja (teorija lastniških pravic) moč izvira iz lastništva, podjetje pa sestavljajo sredstva podjetja (Grossman in Hart, 1986). Ne preseneča dejstvo, da po tej teoriji deležniki niso del podjetja, saj si ljudi ne moremo lastiti. Seveda pa lastništvo ni edini vir moči v podjetju. Rajan in

Zingales (1998) npr. menita, da moč v podjetju izvira iz kontrole nad za poslovanje podjetja pomembnimi sredstvi, medtem ko naj bi mehanizem za dodeljevanje moči predstavljal dostop oziroma možnost uporabe teh sredstev. Agentu, ki je omogočen dostop do sredstev oziroma njihova uporaba tako ne pridobi rezidualne pravice kontrole, temveč le možnost za specializacijo svojega človeškega kapitala, s čimer pridobi moč v podjetju. V skladu z novo teorijo podjetje sestavljajo za podjetje pomembna sredstva kot tudi različni agenti, ki jim je omogočen dostop do teh sredstev oziroma njihova uporaba. Poleg tega nova teorija poleg lastnikov v podjetje pripelje druge deležnike. Za razliko od obstoječe teorije podjetja nova teorija podjetja obravnava zaposlene in managerje kot pomemben del podjetja.

Z namenom razpoznave ciljev različnih deležnikov v podjetju in tako cilja poslovanja deležniško usmerjenega podjetja, v nadaljevanju analiziram njihove terjatve v podjetju. Z uporabo modelov za ocenjevanje vrednosti opcij, ki so jih razvili Black in Scholes (1973) ter Merton (1973, 1974), po analogiji z izpeljavo rezidualne in fiksne terjatve (Merton, 1974) izpeljem enačbo za vrednost terjatev zaposlenih in managerjev. Na podlagi analize njihovih terjatev ugotavljam, da so zaposleni nagnjeni k maksimizaciji plač in minimizaciji verjetnosti stečaja, medtem ko naj bi bil cilj managerjev nekje med maksimizacijo plač in drugih denarnih in nedenarnih prejemkov ter maksimizacijo vrednosti podjetja, ki vpliva na njihovo nagrajevanje.

To mi omogoči sklepati o cilju poslovanja podjetja, v katerem vladajo zaposleni, in podjetja, v katerem vladajo managerji. Sklepam, da je cilj poslovanja podjetja, v katerem vladajo zaposleni, maksimizacija plač in minimizacija verjetnosti stečaja. Ker je kariera zaposlenih omejena, sklepam, da so cilji zaposlenih v primerjavi s cilji lastnikov bolj kratkoročni, poleg tega tudi manj naklonjeni tveganju. Managerji naj bi maksimizirali plače in druge denarne in nedenarne prejemke in šele nato vrednost podjetja, ki vpliva na njihovo nagrajevanje. Zaradi ugleda, ki bi ga izgubili ob morebitnem stečaju, pa v praksi pogosto opazimo nagnjenost k maksimizaciji preživetja podjetja. To se kaže v maksimizaciji prihodkov oziroma rasti podjetja.

Struktura kapitala v podjetju, v katerem vladajo zaposleni, in podjetju, v katerem vladajo managerji

Na podlagi poznavanja ciljev poslovanja podjetij, v katerih vladajo zaposleni oziroma managerji, raziskujem strukturo kapitala v teh podjetjih. Raziskujem ponudbo dolga in povpraševanje po dolgu s strani teh podjetij. Moja hipoteza je, da so podjetja, v katerih vladajo zaposleni oziroma managerji, manj zadolžena, poleg tega obstajajo drugi kanali, preko katerih prihaja do vplivov na strukturo kapitala. To je posledica omejene ponudbe dolžniških virov financiranja in manjšega povpraševanja po dolgu s strani teh podjetij ter njihovih specifičnih ciljev in nenaklonjenosti tveganju.

Ponudbo dolga raziskujem z uporabo tako imenovanih modelov omejevanja ponudbe kreditov (*angl*. credit rationing models), ki so jih razvili Jaffe in Russell (1976), Keeton (1979) in Stiglitz in Weiss (1981, 1983). Za trg dolga je namreč značilno omejevanje ponudbe dolga. Omejevanje ponudbe dolga je pojav, ko posojilojemalec ne more pridobiti posojila, čeprav je pripravljen plačati tržno obrestno mero ali celo višjo obrestno mero od tržne. Če na trgu povpraševanje presega ponudbo, navadno pride do zvišanja cene, ki povzroči zmanjšanje povpraševanja in/ali povečanje ponudbe, dokler se povpraševanje in ponudba ne izenačita. Na trgu dolga pa obrestna mera ne opravi svoje funkcije. Jaffe in Russell (1976), Keeton (1979) in Stiglitz in Weiss (1981, 1983) trdijo, da je razlog v asimetriji informacij med posojilojemalci in posojilodajalci oziroma problema nepravilne izbire in moralnega hazarda. Zaradi asimetrije informacij oziroma problema nepravilne izbire in moralnega hazarda nekateri posojilojemalci ne morejo pridobiti posojila, medtem ko so ostali, ki ga dobijo, soočeni z zmanjšano sposobnostjo zadolževanja. Ker menim, da je za podjetja, v katerih vladajo zaposleni oziroma managerji, značilna večja asimetrija informacij, poleg tega so omejena pri signaliziranju svoje kreditne sposobnosti in zmanjševanju asimetrije, pričakujem, da je vpliv problema nepravilne izbire ter tako problem omejevanja ponudbe dolga na ta podjetja večji kot na podjetja, v katerih vladajo lastniki. Dodatno na omejevanje ponudbe dolga oziroma zmanjšano sposobnost zadolževanja v teh podjetij vplivajo višji stroški agentov in moralni hazard v primerjavi s podjetji, v katerih vladajo lastniki.

O povpraševanju po dolgu s strani podjetij, v katerih vladajo zaposleni oziroma managerji, sklepam na podlagi poznavanja ciljev teh podjetij in njihove nenaklonjenosti tveganju. Nenaklonjenost tveganju je posledica dejstva, da donos zaposlenih in managerjev, za razliko od finančnih investitorjev (delničarjev – lastnikov), ne izvira iz razpršenega finančnega premoženja, temveč nerazpršenega človeškega kapitala. Zaposleni in managerji ne morejo človeškega kapitala razpršiti med več zaposlitev, kot to lahko stori finančni investitor z razpršitvijo svojega finančnega premoženja med različne naložbe, saj so lahko istočasno zaposleni samo v enem podjetju. Izsledki obstoječih raziskav jasno kažejo, da bodo podjetja, v katerih vladajo managerji, kot tudi podjetja, v katerih vladajo zaposleni, izbrala manjšo zadolženost v primerjavi s podjetji, v katerih vladajo lastniki. Odločitve o strukturi kapitala pa so posledica drugih mehanizmov. Morellec (2004) npr. ugotavlja, da bo zadolženost, ki jo izbere manager, ki tehta med željo po gradnji imperijev in potencialno izgubo kontrole, v primerjavi z zadolženostjo, ki maksimizira vrednost podjetja in bi jo radi implementirali lastniki, nižja za skoraj 20 odstotnih točk (manager izbere 17,6 %, lastniki pa izberejo 37 %). Še bolj prepričljive so ugotovitve raziskav, ki ugotavljajo vplive nenaklonjenosti tveganju pri managerjih na zadolženost, kjer so si avtorji enotni o značilnem negativnem vplivu (Friend in Lang, 1988; Berger et al.,1997). Podobni so sklepi za podjetja, v katerih vladajo zaposleni. Chang (1992) analizira optimalno pogodbo med lastniki in zaposlenimi, ki vključuje tudi izbor strukture kapitala, z upoštevanjem stroškov, ki jih nosijo zaposleni pri prestrukturiranju podjetja, in pokaže, da je zadolženost, ki izhaja iz optimalne pogodbe, nižja od zadolženosti, ki maksimizira vrednost podjetja. Berk et al. (2007) analizirajo optimalno pogodbo upoštevaje stroške potencialnega stečaja, ki bi jih nosili zaposleni,

in trdijo, da bodo podjetja imela nizko zadolženost navkljub koristi, ki bi jih prinesel davčni ščit pri višji zadolženosti. Trdijo, da so odločitve o strukturi kapitala tesno povezane z za podjetje značilnim odnosom do tveganja. Njihove hipoteze so bile tudi empirično potrjene. Chemmanur et al. (2009) namreč empirično potrdijo pozitivno povezanost med zadolženostjo in višino plač zaposlenih in pokažejo, da dodatni stroški plač več kot odtehtajo dodatne koristi, izhajajoče iz davčnega ščita.

Empirična študija strukture kapitala v podjetjih, v katerih vladajo zaposleni

V empirični študiji se omejim na raziskovanje vpliva vladanja zaposlenih na strukturo kapitala. Kot že rečeno, je moja hipoteza, da so podjetja, v katerih vladajo zaposleni, v primerjavi s podjetji, v katerih vladajo lastniki, soočena z manjšo ponudbo dolga, poleg tega imajo ta podjetja tudi manjše povpraševanje po dolžniškem financiranju. Poleg nižje zadolženosti pričakujem, da podjetja, v katerih vladajo zaposleni, v primerjavi s podjetji, v katerih vladajo lastniki, v večji meri uporabljajo notranje vire financiranja, pri zadolževanju morajo zastaviti več premoženja in so ob enaki variabilnosti donosov manj zadolžena. Pričakujem tudi, da je v ročnostni strukturi dolžniških virov v podjetjih, v kateri vladajo zaposleni, več kratkoročnega dolga in da so ta podjetja soočena z višjimi stroški dolga. Črnigoj in Mramor (2009) ugotavljata, da se podjetja, v katerih vladajo zaposleni, načeloma izogibajo financiranju z dolgom, če pa je to že potrebno, se raje odločijo za kratkoročni dolg. Flannery (1986) in Diamond (1991) pa pokažeta, da lahko podjetja z izbiro kratkoročnega namesto dolgoročnega dolga in zagotovitvijo manjšega obsega sredstev, kot ga bodo potrebovala v prihodnosti, signalizirajo svojo kreditno sposobnost, saj s tem pokažejo, da so pripravljena refinancirati dolg. Ker imajo podjetja, v katerih vladajo zaposleni, omejene zmožnosti uporabe ostalih načinov signaliziranja, kot so npr. investiranje lastnih sredstev v podjetje, zastavljanje premoženja in politika dividend, pričakujem, da so ta podjetja bolj nagnjena k uporabi tega načina signaliziranja. Hipoteza o višjih stroških dolga v podjetjih, v katerih vladajo zaposleni, pa sledi iz nenaklonjenosti finančnega trga do poslovanja z »demokratičnimi« podjetji oziroma preferiranja podjetij, v katerih vladajo lastniki, ki naj bi zaradi sledenja maksimizaciji vrednosti bolje upravljali z njihovimi sredstvi. Vpliv zaposlenih preučujem na podlagi treh različnih vzvodov. Analiziram vpliv lastništva zaposlenih, zmožnost vplivanja na odločitve, ki jo imajo zaposleni ne glede na lastništvo in se kaže v utrjevanju zaposlenih, in koncentracije lastništva, ki vpliva na izvajanje nadzora. Moja hipoteza je, da je zmožnost vplivanja na odločitve, ki jo imajo zaposleni ne glede na lastništvo, in se kaže v utrjevanju zaposlenih, negativno povezana z zadolženostjo. Prav tako pričakujem negativno povezanost med koncentracijo lastništva, ki vpliva na izvajanje nadzora in zadolženostjo, medtem ko na podlagi raziskovanja vpliva lastništva ne moremo postaviti enoznačne hipoteze.

S ciljem obravnave podjetij, ki izhajajo iz različnih pravnih okolij, obravnavam podjetja iz 12 evropskih držav: štirih zahodno evropskih držav (Francije, Nemčije, Švedske in Združenega kraljestva), petih centralno evropskih držav (Češke, Poljske, Madžarske, Slovaške in Slovenije)

in treh baltskih držav (Estonije, Latvije in Litve). Vir je baza podatkov AMADEUS (Bureau van Dijk). AMADEUS je obsežna vse-evropska baza podatkov, ki vključuje več kot 10 milijonov javnih in privatnih podjetij iz 38 evropskih držav, ki vsebuje računovodske podatke kot tudi podatke o lastništvu v primerljivem formatu, ki je potreben za tovrstno raziskovanje.

Vpliv vladanja zaposlenih na strukturo kapitala raziskujem z uporabo regresijske analize oziroma panelnih metod ocenjevanja. Panelne metode ocenjevanja postajajo standard empiričnega raziskovanja na področju strukture kapitala. Njihovo uporabo narekujejo že omenjene ugotovitve, da večino razlik v zadolženosti med podjetji pojasni neopazovani učinek, ki se s časom ne spreminja (Lemmon et al., 2006). Ocenjevanje regresijskega modela z uporabo metode najmanjših kvadratov, ki ne kontrolira vplivov tovrstnih učinkov, bi namreč rezultiralo v nekonsistentnih ocenah regresijskih koeficientov. V mojem primeru na neopazovani učinek, ki se s časom ne spreminja, pokaže že analiza zadolženosti podjetij po letih. S spremljanjem gibanja zadolženosti skupin podjetij v obdobju od leta 1998 do leta 2007, razvrščenih po zadolženosti v letu 1998 v skupine z nizko zadolženostjo, srednjo, visoko in zelo visoko zadolženostjo, opažam sicer ob manjši konvergenci relativno stabilnost politike strukture kapitala. Razlik pa ne morem pojasniti z uveljavljenimi faktorji.

Rezultati regresijske analize kažejo, da so podjetja, v katerih vladajo zaposleni, manj zadolžena od podjetij, v katerih vladajo drugi deležniki. Rezultati kažejo na negativno povezanost zadolženosti podjetja in utrjevanja s strani zaposlenih in nekoliko manj značilen negativen vpliv lastništva zaposlenih. V nasprotju s pričakovanji pa rezultati kažejo na negativno povezanost med zadolženostjo in koncentracijo lastništva podjetja oziroma učinkovitostjo izvajanja nadzora. Izgleda, da večinski lastniki ne uporabljajo dolga za usklajevanje obnašanja zaposlenih z njihovimi lastnimi interesi. V skladu s pričakovanji opažam tudi značilne razlike v vplivu ostalih faktorjev, ki vplivajo na odločitve o strukturi kapitala. Podjetja, v katerih vladajo zaposleni, so pri enaki variabilnosti donosov manj zadolžena. Rezultati pa ne potrjujejo hipoteze, da se podjetja, v katerih vladajo zaposleni, naslanjajo na uporabo notranjih virov financiranja v večji meri in morajo pri zadolževanju zastaviti več premoženja kot podjetja, v katerih vladajo drugi deležniki. Prav tako se podjetja, v katerih vladajo zaposleni, ne odločajo za več kratkoročnega dolga in niso soočena z višjimi stroški dolga.

Z ugotovitvami, predstavljenimi v doktorski disertaciji, sem prispeval k maloštevilnim prispevkom na področju raziskav strukture kapitala v podjetjih, v katerih vladajo deležniki, kot so npr. managerji in zaposleni. Odločitve o strukturi kapitala sem raziskoval z ločeno obravnavo ponudbe dolga in povpraševanja po dolgu. Navadno se pri raziskavah odločitev o strukturi kapitala dejavnikov na strani ponudbe in dejavnikov na strani povpraševanja ne razlikuje, zato menim, da to predstavlja nov pristop, ki bi lahko dodatno osvetlil problematiko financiranja podjetij. Poleg tega sem prišel do pomembnih empiričnih ugotovitev o strukturi kapitala v podjetjih, v kateri vladajo zaposleni. Nenazadnje sem v doktorski disertaciji podal natančen

pregled sistemov korporativnega upravljanja po svetu in nove teorije podjetja ter razvil novo paradigmo korporativnega upravljanja, ki odraža deležniško-orientirano podjetje. Izpeljal sem terjatve različnih deležnikov v podjetju, ki definirajo njihove cilje in sklepal o cilju poslovanja deležniško-orientiranega podjetja. Omejitve pa se nanašajo predvsem na nezmožnost pojasnjevalnih spremenljivk, uporabljenih za oceno moči zaposlenih, ki kljub temu da zadovoljivo pojasnijo konzervativnost podjetij pri njihovih finančnih odločitvah, ne uspejo pojasniti primarnega faktorja, ki vpliva na strukturo kapitala – neopazovanega učinka, ki se s časom ne spreminja. Menim, da bi z bolj natančno oceno moči zaposlenih lahko v večji meri pojasnili neopazovani učinek, ki se s časom ne spreminja, in tako tudi večji delež razlik v strukturi kapitala med podjetji. Druge omejitve se nanašajo na nezmožnost razpoznave vpliva lastništva zaposlenih in koncentracije lastništva, ki vpliva na izvajanje nadzora, ki pa izvirajo iz pomanjkljivosti baze podatkov, ki ni najbolj primerna za analizo lastniške strukture podjetij.