The Theory of Corporate Finance

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à Naïs, Margot, et Romain

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I am, of course, entirely responsible for any remaining errors and omissions. Needless to say, I will be grateful to have these pointed out; comments on this book can be either communicated to me directly or uploaded on the following website:

http://www.pupress.princeton.edu/titles/8123.html

Note that this website also contains exercises, answers, and some lecture transparencies which are available for lecturers to download and adapt for their own use, with appropriate acknowledgement.

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Introduction

This introduction has a dual purpose: it explains the book's approach and the organization of the chapters; and it points up some important topics that receive insufficient attention in the book (and provides an inexhaustive list of references for additional reading). This introduction will be of most use to teachers and graduate students. Anyone without a strong economics background who is finding it tough going on a first reading should turn straight to Chapter 1.

Overview of the Field and Coverage of the Book

The field of corporate finance has undergone a tremendous mutation in the past twenty years. A substantial and important body of empirical work has provided a clearer picture of patterns of corporate financing and governance, and of their impact for firm behavior and macroeconomic activity. On the theoretical front, the 1970s came to the view that the dominant Arrow–Debreu general equilibrium model of frictionless markets (presumed perfectly competitive and complete, and unhampered by taxes, transaction costs, and informational asymmetries) could prove to be a powerful tool for analyzing the pricing of claims in financial markets, but said little about the firms' financial choices and about their governance. To the extent that financial claims' returns depend on some choices such as investments, these choices, in the complete market paradigm of Arrow and Debreu, are assumed to be contractible and therefore are not affected by moral hazard. Furthermore, investors agree on the distribution of a claim's returns; that is, financial markets are not plagued by problems of asymmetric information. Viewed through the Arrow–Debreu lens, the key issue for financial economists is the allocation of risk among investors and the pricing of redundant claims by arbitrage.

Relatedly, Modigliani and Miller in two papers in 1958 and 1963 proved the rather remarkable result that under some conditions a firm's financial structure, for example, its choice of leverage or of dividend policy, is irrelevant. The simplest set of such conditions is the Arrow–Debreu environment (complete markets, no transaction costs, no taxes, no bankruptcy costs).[1] The value of a financial claim is then equal to the value of the random return of this claim computed at the Arrow–Debreu prices (that is, the prices of state-contingent securities, where a state-contingent security is a security delivering one unit of numéraire in a given state of nature). The total value of a firm, equal to the sum of the values of the claims it issues, is thus equal to the value of the random return of the firm computed at the Arrow–Debreu prices. In other words, the size of the pie is unaffected by the way it is carved.

Because we have little to say about firms' financial choices and governance in a world in which the Modigliani–Miller Theorem applies, the latter acted as a detonator for the theory of corporate finance, a benchmark whose assumptions needed to be relaxed in order to investigate the determinants of financial structures. In particular, the assumption that the size of the pie is unaffected by how this pie is distributed had to be discarded. Following the lead of a few influential papers written in the 1970s (in particular, Jensen and Meckling 1976; Myers 1977; Ross 1977), the principal direction of inquiry since the 1980s has been to introduce agency problems at various levels of the corporate structure (managerial team, specific claimholders).

1. For more general conditions, see, for example, Stiglitz (1969, 1973, 1974) and Duffie (1992).

This shift of attention to agency considerations in corporate finance received considerable support from the large empirical literature and from the practice of institutional design, both of which are reviewed in Part I of the book. Chapters 1 and 2 offer introductions to corporate governance and corporate financing, respectively. They are by no means exhaustive, and do not do full justice to the impressive body of empirical and institutional knowledge that has been developed in the last two decades. Rather, these chapters aim at providing the reader with an overview of the key institutional features, empirical regularities, and policy issues that will motivate and guide the subsequent theoretical analysis.

The theoretical literature on the microeconomics of corporate finance can be divided into several branches.

The first branch, reviewed in Part II, focuses entirely on the incentives of the firm's *insiders*. Outsiders (whom we will call investors or lenders) are in a principal–agent relationship with the insiders (whom we will call borrowers, entrepreneurs, or managers). Informational asymmetries plague this agency relationship. Insiders may have private information about the firm's technology or environment (adverse selection) or about the firm's realized income (hidden knowledge);[2] alternatively outsiders cannot observe the insiders' carefulness in selecting projects, the riskiness of investments, or the effort they exert to make the firm profitable (moral hazard). Informational asymmetries may prevent outsiders from hindering insider behavior that jeopardizes their investment.

Financial contracting in this stream of literature is then the design of an incentive scheme for the insiders that best aligns the interests of the two parties. The outsiders are viewed as passive cash collectors, who only check that the financial contract will allow them to recoup on average an adequate rate of return on their initial investment. Because outsiders do not interfere in management, the split of returns among them (the outsiders' return is defined as a residual, once insiders' compensation is subtracted from profit) is irrelevant. That is, the Modigliani–Miller Theorem applies to outside claims and there is no proper security design. One might as well assume that the outsiders hold the same, single security.

Chapter 3 first builds a fixed-investment moral-hazard model of credit rationing. This model, together with its variable-investment variant developed later in the chapter, will constitute the workhorse for this book's treatment. It is then applied to the analysis of a few standard themes in corporate finance: the firm's temptation to overborrow, and the concomitant need for covenants restricting future borrowing; the sensitivity of investment to cash flow; and the notion of "debt overhang," according to which profitable investments may not be undertaken if renegotiation with existing claimants proves difficult. Third, it extends the basic model to allow for an endogenous choice of investment size. This extension, also used in later chapters, is here applied to the derivation of a firm's borrowing capacity. The supplementary section covers three related models of credit rationing that all predict that the division of income between insiders and outsiders takes the form of inside equity and outside debt.

Chapter 4 analyzes some determinants of borrowing capacity. Factors facilitating borrowing include, under some conditions, diversification, existence of collateral, and willingness for the borrower to make her claim illiquid. In each instance, the costs and benefits of these corporate policies are detailed. In contrast, the ability for the borrower to renegotiate for a bigger share of the pie reduces her ability to borrow. The supplementary section develops the themes of group lending and of sequential-projects financing, and draws their theoretical connection to the diversification argument studied in the main text.

Chapter 5 looks at multiperiod financing. It first develops a model of liquidity management and shows how liquidity requirements and lines of credit for "cash-poor" firms can be natural complements to the standard solvency/maximum leverage requirements imposed by lenders. Second, the chapter shows that the optimal design of debt maturity and the "free-cash-flow problem" encountered by cash-rich firms form the mirror image of the "liquidity

2. The distinction between adverse selection and hidden knowledge is that insiders have private information about exogenous (environmental) variables at the date of contracting in the case of adverse selection, while they acquire such private information after contracting in the case of hidden knowledge.

shortage problem" faced by firms generating insufficient net income in the short term. In particular, the model is used to derive comparative statics results on the optimal debt maturity structure. It is shown, for example, that the debt of firms with weak balance sheets should have a short maturity structure. Third, the chapter provides an integrated account of optimal liquidity and risk management. It first develops the benchmark case in which the firm optimally insulates itself from any risk that it does not control. It then studies in detail five theoretical reasons why firms should only partially hedge. Finally, the chapter revisits the sensitivity of investment to cash flow, and demonstrates the possibility of a "soft budget constraint."

Chapter 6 introduces asymmetric information between insiders and outsiders at the financing stage. Investors are naturally concerned by the prospect of buying into a firm with poor prospects, that is, a "lemon." Such adverse selection in general makes it more difficult for insiders to raise funds. The chapter relates two standard themes from the contract-theoretic literature on adverse selection, market breakdown, and cross-subsidization of bad borrowers by good ones, to two equally familiar themes from corporate finance: the negative stock price reaction associated with equity offerings and the "pecking-order hypothesis," according to which issuers have a preference ordering for funding their investments, from retained earnings to debt to hybrid securities and finally to equity. The chapter then explains why good borrowers use dissipative signals; it again revisits familiar corporate finance observations such as the resort to a costly certifier, costly collateral pledging, short-term debt maturities, payout policies, limited diversification, and underpricing. These dissipative signals are regrouped under the general umbrella of "issuance of low-information-intensity securities."

Chapter 7, a topics chapter, first analyzes the two-way interaction between corporate finance and product-market competition: how do market characteristics affect corporate financing choices? How do other firms, rivals or complementors, react to the firm's financial structure? Direct (profitability) and indirect (benchmarking) effects are shown to affect the availability of funds as well as financial structure decisions (debt maturity, financial muscle, corporate governance).

The chapter then extends the class of insider incentive problems. While the standard incentive problem is concerned with the possibility that insiders waste resources and reduce average earnings, managers can engage in moral hazard in other dimensions, not so much to reduce their efforts or generate private benefits, but rather to alter the very performance measures on which their reward, their tenure in the firm, or the continuation of the project are based. We call such behaviors "manipulations of performance measures" and analyze three such behaviors: increase in risk, forward shifting of income, and backward shifting of income.

The second branch of corporate finance addresses both *insiders' and outsiders' incentives* by taking a less passive view of the role of outsiders. While they are disconnected from day-to-day management, outsiders may occasionally affect the course of events chosen by insiders. For example, the board of directors or a venture capitalist may dismiss the chief executive officer or demand that insiders alter their investment strategy. Raiders may, following a takeover, break up the firm and spin off some divisions. Or a bank may take advantage of a covenant violation to impose more rigor in management. Insiders' discipline is then provided by their incentive scheme *and* the threat of external interference in management.

The increased generality brought about by the consideration of outsiders' actions has clear costs and benefits. On the one hand, the added focus on the claimholders' incentives to control insiders destroys the simplicity of the previous principal–agent structure. On the other hand, it provides an escape from the unrealism of the Modigliani–Miller Theorem. Indeed, claimholders must be given proper incentives to intervene in management. These incentives are provided by the return streams attached to their claims. The split of the outsiders' total return among the several classes of claimholders now has real implications and *security design* is no longer a trivial appendix to the design of managerial incentives.

This second branch of corporate finance can itself be divided into two subbranches. The first, reviewed

in Part III, analyzes the *monitoring* of management by one or several securityholders (large shareholder, main bank, venture capitalist, etc.). As we just discussed, the monitors in a sense are insiders themselves as they must be given proper incentives to fulfill their mission. The material reviewed in Part III might therefore be more correctly described as the study of financing in the presence of multiple insiders (managers plus monitors). We will, however, maintain the standard distinction between nonexecutive parties (the securityholders, some of which have an active monitoring role) and executive officers. But we should keep in mind the fact that the division between insiders and outsiders is not a foregone conclusion.

Chapter 8 investigates the social costs and benefits of passive monitoring, namely, the acquisition, by outsiders with purely speculative motives, of information about the value of assets in place; and it shows how they relate to the following questions. Why are entrepreneurs and managers often compensated through stocks and stock options rather than solely on the basis of what they actually deliver: profits and losses? Do shareholders who are in for the long term benefit from liquid and deep secondary markets for shares?

The main theme of the chapter is that a firm's stock market price continuously provides a measure of the value of assets in place and therefore of the impact of managerial behavior on investor returns.

In Chapter 9, by contrast, active monitoring curbs the borrower's moral hazard (alternatively, it could alleviate adverse selection). Monitoring, however, comes at some cost: mere costs for the monitors of studying the firms and their environment, monitors' supranormal profit associated with a scarcity of monitoring capital, reduction in future competition in lending to the extent that incumbent monitors acquire superior information on the firm relative to competing lenders, block illiquidity, and monitors' private benefits from control.

Part IV develops a control-rights approach to corporate finance. Chapter 10 analyzes the allocation of formal control between insiders and outsiders. A firm that is constrained in its ability to secure financing must allocate (formal) control rights between insiders and outsiders with a view to creating pledgeable income; that is, control rights should not necessarily be granted to those who value them most. This observation generates a rationale for "shareholder value" as well as an empirically supported connection between firms' balance-sheet strength and investors' scope of control. The chapter then shows how (endogenously) better-informed actors (management, minority block shareholders) enjoy (real) control without having any formal right to decide; and argues that the extent of managerial control increases with the strength of the firm's balance sheet and decreases with the (endogenous) presence of monitors. Finally, Chapter 10 analyzes the allocation of control rights among different classes of securityholders. While the paradigm reviewed in Part III already generated conflicts among the securityholders by creating different reward structures for monitors and nonmonitors, this conflict was an *undesirable* side-product of the incentive structure required to encourage monitoring. As far as monitoring was concerned, nonmonitors and monitors had congruent views on the fact that management should be monitored and constrained. Chapter 10 shows that conflicts among securityholders may arise *by design* and that control rights should be allocated to securityholders whose incentives are least aligned with managerial interests when firm performance is poor.

Chapter 11 focuses on a specific control right, namely, raiders' ability to take over the firm. As described in Chapter 1, this ability is determined by the firm's takeover defense choices (poison pills, dual-vote structures, and so forth), as well as by the regulatory environment. In order not to get bogged down by country- and time-specific details, we first develop a "normative theory of takeovers," identifying their two key motivations (bringing in new blood and ideas, and disciplining current management) and studying the social efficiency of takeover policies adopted by the firms. The chapter then turns to the classical theory of the tendering of shares in takeover contests and of the free-rider problem, and studies firms' choices of poison pills and dual-class voting rules.

A third branch of modern corporate finance, reviewed in Part V, takes into account the existence of *investors' clienteles* and thereby returns to the

classical view that securityholders differ in their preferences for state-contingent returns. For instance, it emphasizes the fact that individual investors as well as corporations attach a premium to the possibility of being able to obtain a decent return on their asset portfolio if they face the need to liquidate it. Chapter 12 therefore studies consumer liquidity demand. Consumers who may in the future face liquidity needs value flexibility regarding the date at which they can realize (a decent return on) their investment. It identifies potential roles for financial institutions as (a) liquidity pools, preventing the waste associated with individual investments in low-yield, short-term assets, and (b) insurers, allowing consumers to smooth their consumption path when they are hit by liquidity shocks; and argues that the second role is more fragile than the first in the presence of arbitrage by financial markets. It then studies bank runs. Finally, the chapter argues that heterogeneity in the consumers' preference for flexibility segments investors into multiple clienteles, with consumers with short horizons demanding safe (low-information-intensity) securities and those with longer horizons being rewarded through equity premia for holding risky securities.

Part VI analyzes the implications of corporate finance for *macroeconomic activity and policy*. Much evidence has been gathered that demonstrates a substantial impact of liquidity and leverage problems on output, investment, and modes of financing. As we will see, the agency approach to corporate finance implies that economic shocks tend to be amplified by the existence of financial constraints, and offers a rationale for some macroeconomic phenomena such as credit crunches and liquidity shortages. Economists since Irving Fisher have acknowledged the role of credit constraints in amplifying recessions and booms. They have distinguished between the "balance-sheet channel," which refers to the influence of firms' balance sheets on investment and production, and the "lending channel," which focuses on financial intermediaries' own balance sheets. Chapter 13 sets corporate finance in a general equilibrium environment, enabling the endogenous determination of factor prices (interest rates, wages). It also shows that transitory balance-sheet effects may have long-term (poverty-trap) effects on individual families or countries altogether, and investigates the factors of dynamic complementarities or substitutabilities.

Capital reallocations (mergers and acquisitions, sales of property, plants and equipment) serve to move assets from low- to high-productivity uses, and, as emphasized in several chapters, may further be driven by managerial discipline and pledgeable income creation concerns. Chapter 14 endogenizes the resale value of assets in capital reallocations. It first focuses on specialized assets, which can be resold only within the firm's industry. Their resale value then hinges on the presence in the industry of other firms that have (a) a demand for the assets and (b) the financial means to purchase them. A central focus of the analysis is whether firms build too much or too little "financial muscle" for use in future acquisitions. Second, the chapter studies nonspecialized assets, which can be redeployed in other industries, and looks at the dynamics of credit constraints and economic activity depending on whether these assets are or are not the only stores of value in the economy.

Chapter 15 investigates the very existence of stores of value in the economy, as these stores of value condition the corporate sector's ability to meet liquidity shocks in the aggregate. It builds on the analysis of Chapter 5 to derive individual firms' demand for liquid assets and then looks at equilibrium in the market for these assets. It is shown that the private sector creates its own liquidity and that this "inside liquidity" may or may not suffice for a proper functioning of the economy. A shortage of inside liquidity makes "outside liquidity" (existing rents, government-created liquidity backed by future taxation) valuable and has interesting implications for the pricing of assets.

Laws and regulations that affect the borrowers' ability to pledge income to their investors, and more generally the many public policies that influence corporate profitability and pledgeable income (tax, labor and environmental laws, prudential regulation, capital account liberalization, exchange rate management, and so forth) have a deep impact on the firms' ability to secure funding and on their design of financial structure and governance. Chapter 16 defines "contracting institutions" as referring to the

public policy environment at the time at which borrowers, investors and other stakeholders contract; and "property rights institutions" as referring to the resilience or time-consistency of these policies. Chapter 16 derives a "topsy-turvy principle" of policy preferences, according to which for a widespread variety of public policies, the relative preference of heterogeneous borrowers switches over time: borrowers with weak balance sheets have, before they receive funding, the highest demand for investor-friendly public policies, but they are the keenest to lobby to have these policies repudiated once they have secured financing. This principle is applied to public policies affecting the legal enforcement of collateral, income, and control rights pledges made by borrowers, and is shown to alter the levels of collateral, the maturity of debts, and the allocation of control. The chapter then shows that borrowers exert externalities (mediated by the political process) through their design of financial structures. Finally, it studies the emergence of public policies in an environment in which policies are set by majority rule.

The book contains a large number of exercises. While some are just meant to help the reader gain familiarity with the material, many others have a dual purpose and cover insights derived in contributions that are not surveyed or little emphasized in the core of the text; a few exercises develop results not available in the literature. I would like to emphasize that solving exercises is, as in other areas of study, a key input into mastering corporate finance theory. Students will find many of these exercises challenging, but hopefully eventually rewarding. With this perspective, the reader will find in Part VII answers and hints to most exercises as well as a few review questions and exercises. Also see the website for the book at http://www.pupress.princeton.edu/titles/8123.html, where these exercises, answers, and some lecture transparencies are available for lecturers to download and adapt for their own use, with appropriate acknowledgement.

Approach

While tremendous progress has been made on the theoretical front in the past twenty years, the lack of a unified framework often disheartens students of corporate finance. The wide discrepancy of assumptions across papers not only lengthens the learning process, but it also makes it difficult for outsiders to identify the key economic elements driving the analyses. This diversity of modeling approaches is a natural state of affairs and is even beneficial for a young, unexplored field, but is a handicap when we try to take stock of our progress in understanding corporate finance.

The approach taken here obeys four precepts. The first is to stick as much as possible to the same modeling choices. The book employs a single, elementary model in order to illustrate the main economic insights. While this unified apparatus does not do justice to the wealth of modeling tools encountered in the literature, it has a pedagogic advantage in that it economizes the reader's investment in new modeling to study each economic issue. Conceptually, this *controlled experiment* highlights new insights by minimizing modifications from one chapter to the next. (The supplementary material in Chapter 3 discusses at some length some alternative modeling choices.)

Second, the exposition aims at simplifying modeling as much as possible. I will try to indicate when this involves a loss of generality. But hopefully it will become clear that the phenomena and insights are robust to more general assumptions. In this respect, I will insist as much as possible on deriving the optimal structure of financing and corporate governance, so as to ensure that the institutions we derive are robust; that is, by exhausting contracting possibilities, we check that the incentive problems we focus on cannot be eliminated.

Third, original contributions have been reorganized and sometimes reinterpreted slightly, for a couple of reasons. First, it is common (and natural!) that authors do not realize the significance of their contributions at the time they write their articles; consequently, they may motivate the paper a bit narrowly, without fully highlighting the key insights that others will subsequently build on. Relatedly, a textbook must take advantage of the benefits of hindsight. Second, the book represents a systematic attempt at organizing the field in a coherent manner. Original articles are often motivated by a specific

application: dividend policy, capital structure, stock issues, stock repurchases, hedging, etc.; while such an application-driven approach is natural for research purposes, it does not fit well with a general treatment of the field since the same model would have to be repeated several times throughout a book that would be structured around applications. I do hope that the original authors will not take offense at this "remodeling" and will rather see it as a tribute to the potency and generality of their ideas.

Fourth, the book is organized in a "horizontal" fashion (by theoretical themes) rather than a "vertical" one (with a division according to applications: debt, dividends, collateral, etc.). The horizontal approach is preferable for an exposition of the theory because it conveys the unity of ideas and does not lead to a repetition of the same material in multiple locations in the book. For readers more interested in a specific topic (say, for empirical purposes), this approach often requires combining several chapters. The links indicated within the chapters should help perform the necessary connections.

Prerequisites and Further Reading

The following chapters are by and large *self-contained*. Some institutional and empirical background is supplied in Part I. This background is written with the perspective of the ensuing theoretical treatment. For a much more thorough treatment of the institutions of corporate finance, the reader may consult, for example, Allen, Brealey, and Myers (2005), Grinblatt and Titman (2002), or Ross, Westerfield, and Jaffe (1999).

Very little knowledge of contract theory and information economics is required. Familiarity with these fields, however, is useful in order to grasp more advanced topics (again, we will stick to fairly elementary modeling). The books by Laffont (1989) and Salanié (2005) offer concise treatments of contract theory. A more exhaustive treatment of contract theory will be found in the textbooks by Bolton and Dewatripont (2005) and Martimort and Laffont (2002). Shorter treatments can be found in the relevant chapters in Kreps (1990), Mas Colell, Whinston, and Green (1995), and Fudenberg and Tirole (1991, Chapter 7 on mechanism design). At a lower level, Milgrom and Roberts (1992) will serve as a useful motivation and introduction. Let us finally mention the survey by Hart and Holmström (1987), which offers a good introduction to the methodology of moral hazard, labor contracts, and incomplete contracting, and that by Holmström and Tirole (1989), which covers a broader range of topics and is nontechnical.

Similarly, no knowledge of the theory of corporate finance is required. Two very useful references can be used to complement the material developed here. Hart (1995) provides a much more complete treatment of a number of topics contained in Part IV, and is highly recommended reading. Freixas and Rochet (1997) offers a thorough treatment of credit rationing and, unlike this book, covers the large field of banking theory.[3] Further useful background reading in corporate finance can be found in Newman, Milgate, and Eatwell (1992), Bhattacharya, Boot, and Thakor (2004), and Constantinides, Harris, and Stulz (2003). Finally, the reader can also consult Amaro de Matos (2001) for a treatment at a level comparable with that of this book.

Some Important Omissions

Despite its length, the book makes a number of choices regarding coverage. Researchers, students, and instructors will therefore benefit from taking a broader perspective. Without any attempt at exhaustivity and in no particular order, this section indicates a few areas in which the omissions are particularly glaring, and includes a few suggestions for further reading.

Empirics

As its title indicates, the book focuses on theory. Some of the key empirical findings are reviewed in Chapters 1 and 2 and serve as motivation in later chapters. Yet, the book falls short of even paying an appropriate tribute to the large body of empirical results established in the last thirty years, let alone of providing a comprehensive overview of empirical corporate finance.

3. Another reference on the theory of banking is Dewatripont and Tirole (1994), which is specialized and focuses on regulatory aspects.

As in other fields of economics, some of the most exciting work involves tying the empirical analysis closely together with theory. I hope that, despite its strong theoretical bias, empirical researchers will find the book useful in their pursuit of this endeavor.

Theory

The book either does not cover or provides insufficient coverage of the following topics.

Taxes. To escape the Modigliani–Miller irrelevance results, researchers, starting with Modigliani and Miller themselves, first turned to the impact of taxes on the financial structure. Taxes affect financing in several ways. For example, in the United States and many other countries, equity is taxed more heavily than debt at the corporate level, providing a preference of firms for leverage.[4] The so-called "static tradeoff theory," first modeled by Kraus and Litzenberger (1973) and Scott (1976), used this fact to argue that the firms' financial structure is determined by a tradeoff between the tax savings brought about by leverage and the financial cost of the enhanced probability of bankruptcy associated with high debt. The higher the tax advantages of debt, the higher the optimal debt–equity ratio. Conversely, the higher the nondebt tax shields, the lower the desired leverage.[5] Taxes also affect payout choices; indeed, much empirical work has investigated the tax cost for firms of paying shareholders in dividends rather than through stock repurchases, which may bear a lower tax burden.[6]

For two reasons, the impact of taxes will be discussed only occasionally. First, the effects are usually conceptually straightforward, and the intellectual challenge is by and large the empirical one of measuring their magnitude. Second, taxes are country- and time-specific, making it difficult to draw general conclusions.[7]

Bubbles. Asset price bubbles, that is, the wedge between the price of financial claims and their fundamental,[8] have long been studied through the lens of aggregate savings and intertemporal efficiency.[9]

Some recent work was partly spurred by the dramatic NASDAQ bubble of the late 1990s, the accompanying boom in initial public offerings (IPOs) and seasoned equity offerings (SEOs), and their collapse in 2000–2001. Relative to the previous literature on bubbles, this new research further emphasizes the impact of bubbles on entrepreneurship and asset values. An early contribution along this line is Allen and Gorton (1993), in which delegated portfolio management, while necessary to channel funds from uninformed investors to the best entrepreneurs, creates agency costs and may generate short horizons[10] and asset price bubbles. Olivier (2000) and Ventura (2004) draw the implications of bubbles that are attached to investment and to entrepreneurship per se, respectively; for example, in Ventura's paper, the prospect of surfing a bubble at the IPO stage relaxes entrepreneurial financing constraints.

Bubbles matter for corporate finance for at least two reasons. First, and as was already mentioned, they may directly increase investment either by altering its yield or by relaxing financial constraints. Second, they create additional stores of value in an economy that may be in need of such stores. Chapter 15 will demonstrate that the existence of stores of value may facilitate firms' liquidity management. This may create another channel of complementarity between bubbles and investments. The research on the interaction between price bubbles and corporate

4. In order to avoid concluding that firms should issue only debt, and no equity, early contributions assumed that bankruptcy is costly. Because more leverage increases the probability of financial distress, equity reduces bankruptcy costs. (Bankruptcy costs, unlike taxes, will be studied in the book.)

5. These predictions have received substantial empirical support (see, for example, Mackie-Mason 1990; Graham 2003). There is a large literature on financial structures and the tax system (Swoboda and Zechner 1995). A recent entry is Hennessy and Whited (2005), who derive a tax-induced optimal financial structure in the presence of taxes on corporate income, dividends, and interest income (as well as equity flotation costs and distress costs).

6. See Lewellen and Lewellen (2004) for a study of the tax benefits of equity under dividend distribution and share repurchase policies.

7. For similar reasons, we will not enter into the details of bankruptcy law, which are highly country- and time-specific. Rather, we will content ourselves with theoretical considerations (in particular in Chapter 10).

8. Fundamentals are defined as the present discounted value of payouts estimated at the consumers' intertemporal marginal rate of substitution.

9. On the "rational bubble" front, see, for example, Tirole (1985), Weil (1987), Abel et al. (1989), Santos and Woodford (1997), and, for an interesting recent entry, Caballero et al. (2004a). Another substantial body of research has investigated "irrational bubbles" (see, for example, Abreu and Brunnermeier 2003; Scheinkman and Xiong 2003; Panageas 2004).

10. See Allen et al. (2004) for different implications (such as overreactions to noisy public information) of short trading horizons.

finance is still in its infancy and therefore is best left to future surveys.

Behavioral finance. An exciting line of recent research relaxes the rationality postulate that dominates this book. There are two strands of research in this area (see Baker et al. (2005), Barberis and Thaler (2003), Shleifer (2000), and Stein (2003) for useful surveys).

One branch of the behavioral corporate finance literature assumes irrational *entrepreneurs or managers*. For example, managers may be too optimistic when assessing the marginal productivity of their investment, the value of assets in place, or the prospects attached to acquisitions (see, for example, Roll 1986; Heaton 2002; Shleifer and Vishny 2003; Landier and Thesmar 2004; Malmendier and Tate 2005; Manove and Padilla 1999). They then recommend value-destroying financing decisions, investments, or acquisitions to their board of directors and shareholders.

In contrast, the other branch of behavioral corporate finance postulates irrrational *investors* and limited arbitrage (see, for example, Sheffrin and Statman 1985; De Long et al. 1990; Stein 1996; Baker et al. 2003). Irrational investors induce a mispricing of claims that (more rational) managers are tempted to arbitrage. For example, managers of a company whose stock is largely overvalued may want to acquire a less overvalued target using its own stocks rather than cash as a means of payment. Managers may want to engage in market timing by conducting SEOs when stock prices are high (see, for example, Baker and Wurgler (2002) for evidence of such market timing behavior). Conglomerates may be a reaction to an irrational investor appetite for diversification, and so forth.

As Baker et al. (2005) point out, the two branches of the literature have drastically different implications for corporate governance: when the primary source of irrationality is on the investors' side, economic efficiency requires insulating managers from the short-term share price pressures, which may result from managerial stock options, the market for corporate control, or an insufficient amount of liquidity (an excessive leverage) that forces the firm to return regularly to the capital market. By contrast, if the primary source of irrationality is on the managers' side, managerial responsiveness to market signals and limited managerial discretion are called for.

Wherever the locus of irrationality, the behavioral approach competes with alternative neoclassical or agency-based paradigms. For example, the managerial hubris story for overinvestment is an alternative to several theories that will be reviewed throughout the book, such as empire building and private benefits (Chapter 3), strategic market interactions (Chapter 7), herd behavior (Chapter 6), or posturing and signaling (Chapter 7). Similarly, market timing, besides being a rational manager's reaction to stock overvaluation, could alternatively result from a common impact of productivity news on investment (calling for equity issues) and stock values,[11] or from the presence of asset bubbles (see references above).

Despite its importance, there are several rationales for not covering behavioral corporate finance in this book (besides the obvious issue of overall length). First, behavioral economic theory as a whole is a young and rapidly growing field. Many modeling choices regarding belief formation and preferences have been recently proposed and no unifying approach has yet emerged. Consequently, modeling assumptions are still too context-specific. A theoretical overview is probably premature.

Second, and despite the intensive and exciting research effort in behavioral economics in general, behavioral corporate finance theory is still rather underdeveloped relative to its agency-based counterpart. For example, I am not aware of any theoretical study of governance and control rights choices that would be the pendant to the theory reviewed in Parts III and VI of the book in the context of irrational investors and/or managers. For instance, and to rephrase Baker et al.'s (2005) concern about normative implications in a different way, we may wonder why managers have discretion (real authority) over the stock issue and acquisitions decisions if shareholders are convinced that their own beliefs are correct. Arbitrage of mispricing often requires

11. See, for example, Pastor and Veronesi (2005). Tests that attempt to tell apart a mispricing rationale often focus on underperformance of shares issued relative to the market index (e.g., Gompers and Lerner 2003).

shareholders' consent, which may not be forthcoming if the latter have the posited overoptimistic beliefs.

International finance. Inspired by the twin (foreign exchange and banking) crises in Latin America, Scandinavia, Mexico, South East Asia, Russia, Brazil, and Argentina (among others) in the last twenty-five years, another currently active branch of research has been investigating the interaction among firms' financial constraints, financial underdevelopment, and exchange rate crises. Theoretical background on financial fragility at the firm and country levels can be found in Chapters 5 and 15, respectively, but financial fragility in a current-account-liberalization context will not be treated in the book.[12]

Financial innovation and the organization of the financial system. Throughout the book, financial market inefficiencies, if any, will result from agency issues. That is, transaction costs will not impair the creation and liquidity of financial claims. See, in particular, Allen and Gale (1994) for a study of markets with an endogenous securities structure.[13]

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12. Some of the earlier contributions are reviewed in Tirole (2002). A inexhaustive sample of more recent references includes Caballero and Krishnamurthy (2004a,b), Pathak and Tirole (2005), and Tirole (2003).

13. Also, while occasionally using simple market microstructure models (see Chapters 8 and 12), the book will not look at the large literature on the determinants of this microstructure and the liquidity of primary and secondary markets (as in, for example, Pagano 1989).

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