Universidade de Aveiro
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As Decisões de Estrutura de Capital das Empresas: Teoria e Evidência Empírica dos Bancos Portugueses

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dissertação apresentada à Universidade de Aveiro para cumprimento dos requisitos necessários à obtenção do grau de Doutor em Gestão Industrial realizada sob a orientação científica do Doutor Samuel L. Hayes III, Professor Emeritus da Harvard Business School da Universidade de Harvard, Boston USA e do Doutor Manuel de Oliveira Marques, Professor Associado da Faculdade de Economia da Universidade do Porto

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Firm's Capital Structure Decisions: Theory and Empirical Evidence from Portuguese Banks

dissertation presented to Universidade de Aveiro in fulfillment of the requirements for the degree of Doctor of Philosophy in Industrial Management produced under the scientific supervision of Samuel L. Hayes III, Professor Emeritus of the Harvard Business School of Harvard University, Boston USA, and Manuel de Oliveira Marques, Associate Professor of Faculdade de Economia of Universidade do Porto

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Resumo

A dissertação analisa, teórica e empiricamente, a problemática das decisões (voluntárias) de estrutura de capital da empresa bancária, com o propósito de promover o alargamento do conhecimento sobre o comportamento das empresas quando definem e reajustam a sua estrutura de financiamento estratégico.

Partindo da teoria geral da estrutura de capital, tipicamente associada com as empresas não-financeiras, desenvolve-se um quadro teórico de referência que suporta a formulação das hipóteses que se submetem a teste empírico. Este estudo foi desenvolvido com base na metodologia de *survey* por entrevista pessoal orientada por questionário estruturado.

A investigação dos determinantes das decisões de estrutura de capital incidiu sobre a população de os Presidentes (executivos) do Conselho de Administração de bancos Portugueses em funções no período compreendido entre 1989 e 1998.

Os resultados obtidos sugerem que a tomada de decisão de estrutura de capital pelos responsáveis das equipas de gestão dos bancos portugueses, durante o período em análise, é consistente com alguns dos determinantes teóricos tipicamente associados com a escolha da relação capital próprio / endividamento das empresas não-financeiras, uma vez levadas em consideração as especificidades inerentes à sua condição de intermediário financeiro. A evidência empírica produzida dá suporte às hipóteses da fiscalidade ao nível dos bancos, dos conflitos de agência e de governação e dos problemas de assimetria de informação como determinantes relevantes na tomada de decisões de estrutura de capital dos bancos Portugueses no período 1989-1998.

A dissertação está organizada como segue:

No capítulo 1é introduzido e formulado o problema da estrutura de capital ao nível da empresa. No capítulo 2 discute-se a teoria geral da estrutura de capital analisando os seus fundamentos teóricos e as suas principais proposições. Em seguida aborda-se a questão da estrutura de capital da empresa bancária desenvolvendo o quadro conceptual de suporte à elaboração do questionário utilizado no estudo empírico. O capítulo 4 contextualiza a selecção da amostra e dos dados bem como caracteriza o desempenho financeiro recente de uma amostra de bancos Portugueses. No capítulo 5 abordam-se alguns dos problemas metodológicos e de método relacionados com a investigação empírica neste domínio. Descreve-se em seguida o desenho da investigação e apresentam-se e discutem-se os resultados obtidos no *survey* realizado. O capítulo 6 apresenta um sumário dos resultados, as conclusões do trabalho e as pistas para investigação futura.

Abstract

The dissertation examines, at both the theoretical and empirical level, the problem of the banking firm's capital structure (voluntary) decisions aiming at broadening our understanding about firms' behavior when deciding about their strategic financing.

We build on the general theory of capital structure, typically associated with the non-financial firm, to develop a theoretical framework able to support the formulation of testable hypotheses. Such hypotheses framed the theoretical underpinnings of the empirical inquiry instrument.

To perform the empirical study of the determinants of such decisions, a comprehensive survey of Chief Executive Officers (CEOs) of Portuguese banks in office during the 1989-1998 period, was undertaken.

The findings indicate that Portuguese banks' capital structure decisions are consistent with a number of theoretical propositions typically associated with the debt-equity choice of non-financial firms once we account, among other factors, for the idiosyncrasy of their financial intermediary nature. Specifically, we provide empirical evidence supporting that taxation at the bank level, agency and governance conflicts and asymmetric information considerations are relevant factors influencing capital structure decision-making of Portuguese banks during the 1989-1998 time period. These results are consistent with the notion that the design of firm's financial structure may

The dissertation is organized as follows:

Chapter 1 introduces and formulates the capital structure problem at the firm level. Chapter 2 provides a comprehensive discussion of the general theory of capital structure. Chapter 3 discusses the capital structure problem at the banking firm level providing the basis for the development of the theoretical model that underlies the survey instrument. Chapter 4 contains a brief characterization of the recent financial performance of a sample of Portuguese banks and describes sample selection and data. Chapter 5 examines some methodological issues related to our empirical study, describes our survey design and reports the results of our survey. Chapter 6 summarizes and concludes the dissertation.

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Chapter 1

Introduction

CHAPTER 1 – Introduction

> Nonetheless, we are unlikely to ever be able to describe observed capital structures with scientific certainty, and every time a consensus seemed ready to emerge among capital structure researchers in the past, financial changes and innovations in the real business world conspired to render agreement impossible. While frustrating, this also makes the study of capital structure a fascinating and challenging pursuit.
>
> William Megginson, *Corporate Finance Theory*

1.1. THE FIRM CAPITAL STRUCTURE: AN OVERVIEW OF THE PROBLEM

It is a widely accepted notion that so-called *modern finance theory* encompasses the study of financial decision-making by individuals and firms, and the structure and operation of capital markets and financial intermediaries.[1] Financial economists have long sought to understand the behavior of firms and individuals in allocating their financial resources to productive activities (e.g., Merton 1995). Within this (general) scientific concern substantial interest has been directed at the question of how firms select the financing structure of their asset-bases. This *capital structure problem* has been a source of intense debate among both, scholars and practitioners. At the core of the debate is the central question of the relevance of strategic financing decisions on firm's valuation. Scientific curiosity about this issue has generated a truly large body of theoretical and empirical literature that collectively, address different aspects of the firm's debt/equity decision.[2] Traditionally, one major focus of the literature has been on the (absolute and relative) demand and supply of the most conventional financing instruments issued by firms, i.e., debt and equity securities. A central question has clearly emerged, though, from all that immense research effort: the wealth effects of corporate capital structure choice.[3] Metaphorically, we could say that corporate capital structure is *la pièce de résistance* of the exquisite *gourmet* menu of corporate finance theory.

Many studies have sought the optimal capital structure since the 'first' and certainly the most celebrated theoretical paper of modern finance theory was published by

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[1] The intersection with other fields of economic thinking is, as argued in Merton (1992, 3), "both permeable and flexible." See, for example, Sharpe (1994), and Fischer and Merton (1984) for a discussion of topics in finance that intersect with macroeconomic theory.

[2] Barclay, Smith, and Watts (1995), among others confirm this notion arguing that "[o]ver the past several decades, finance scholars have engaged in extensive theorizing about factors that might be important in determining a firm's leverage."

Modigliani and Miller in 1958. Their pioneering work, which showed the implications of market equilibrium conditions for firm financing structure and valuation, remains one of the most robust and influential contributions to modern finance theory. In fact, it is frequently associated with the *commencement* of modern finance theory (e.g., Constantinides 1989 and Harris and Raviv 1991).

Although these theoretical and empirical efforts are substantial in volume, the general view is that the topic lacks an empirically confirmed and accepted body of theory. Despite some contributions to our understanding of how managerial behavior shapes corporate capital structure, the research produced to date does not provide an unequivocal basis for establishing, in an unambiguous fashion, the empirical relevance of the different theoretical propositions.

Thus, the most eclectic, prevalent and noncontroversial views about corporate capital structure theory are Myers's *puzzle* argument,[4] mirrored by Kamath's (1997) *enigma*, Stiglitz's *dilemma*,[5] and The Economist's *mystery*.[6] Therefore, we still lack a comprehensive theory to satisfactorily explain for the determinants of the strategic financing choices made by managers. Nor have we achieved a conclusive understanding about the relationship between the firm's capital structure and its valuation.

1.2. The Capital Structure Problem: An Overview of the Literature

A very substantial part of the theoretical and empirical literature on capital structure springs from the observation of North American firms, and from attempts to mirror their idiosyncrasies into theoretic models. In the words of Demirgüç-Kunt and Maksimovic (1994) the "models of financial structure have been developed with the aim of explaining U. S. data" and "they are based on U. S. institutions."[7] Consequently, the generalization of those results to other countries with

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[3] Throughout this dissertation we have adopted the conventional procedure to use interchangeably the terms *capital structure, financing structure* and *long-term financing*.

[4] See Myers (1984).

[5] Stiglitz (1989, 349): "as long as resources are spent on thinking about (and implementing) a corporate financial strategy, we cannot simultaneously hold to the view that firms are rational profit maximizing (shareholders are rational investors) and that debt-equity ratios (and financial policies more generally) are irrelevant."

[6] See, "The Mystery of Corporate Debt," *The Economist*, January 6 1996: 61.

[7] See also, e.g., Saá-Requejo (1996) who points out that"… most of the research on the determinants of capital structure have been done using mainly US data."

(sometimes) remarkably dissimilar economic, financial, and institutional conditions might reveal scientifically inappropriate or imprudent.

Consequently, in the absence of empirically testing the robustness of theoretical propositions outside their environmental contexts of *space*, *time* and *productive activity* it is difficult to determine if these findings are mere circumstantial functional relationships, or if they support any particular theoretic proposition.[8] On the empirical front, this viewpoint is corroborated by Harris and Raviv (1992, 67) who observe that "it seems essential that empirical studies concentrate on testing particular models or classes of models in an attempt to discover the most important determinants of capital structure in given environments."

To mitigate the geographical bias there is a need to substantiate hypotheses about corporate capital structure in non-U.S. environments, as discussed in Rajan and Zingales (1995).[9] These additional scientific examinations could help us to better understand the implications of environmental and behavioral factors on capital structure decisions. Research in this area should therefore contribute for broadening the explicative and predictive relevance of the theory. Therefore, the empirical investigation of corporate finance topics in general, and capital structure issues in particular, in a non-U.S. context represent an opportunity to both extend empirical evidence and develop new theoretical hypotheses, as suggested by, e. g., Rajan and Zingales (1995),[10] and Saá-Requejo (1996).[11]

The rationale behind this conjecture is found in the remarkable disparities among different countries' market structures and institutional architectures and features. Factors, such as, firms' characteristics (e.g., size), regulatory frameworks, governance systems,[12] cultural environments, accounting principles and practices[13] — may account for some

[8] By implication, theories in those conditions could not fulfill Popper's (1979) verifiability requirements.

[9] As argue in Boudon (1990): "the major part of the 'macroscopic' realities to which a general validity was attributed only have a local validity" (translation and emphasis mine).

[10] See footnote 9: "To the extent that other countries are similar to the United States, they provide an independent sample to test the received wisdom. To the extent that they have different institutional structures, they increase our ability to discriminate among alternative theories."

[11] "... the study of decisions taken by firms operating in other financial environments should improve our understanding of the determinants of these decisions" (Ibid.,).

[12] As noted by Milgrom and Roberts (1992, 290) "… rights that come with ownership vary among countries and over time." See Porter (1992) for a discussion of the impact of corporate governance structures on capital allocation, in U.S., Germany, and Japan.

[13] See, e.g., Delbreil *et al*. (1997) for an illustration.

sources of capital structure variance across space, time, and industry.

Consequently, emphasis should be put on the identification of institutional and behavioral factors that may explain capital structure (dis)similarities. Those factors may include: (1) differences in fiscal systems;[14] (2) financial systems design, regulation, and degree of development;[15] (3) bankruptcy laws;[16] (4) relations between banks and firms; (5) national savings levels; and (6) risk preferences of capital market participants.[17]

There is compelling evidence that cross-national capital structures — either aggregated or at firm level — exhibit significant disparities, as Demirgüç-Kunt and Maksimovic (1994), among others, report using empirical results for ten countries for the 1980-1991 period.[18] This same research focus on capital structure in international diversified settings can be found in the works of Remolona (1990),[19] Prowse (1990),[20] Hodder and Senbet (1990),[21] Borio (1990), Kneeshaw (1995),[22] and Delbreil *et al*. (1997).[23]

This trend is expected to prevail in the years ahead as Brennan (1995) — elegantly surveying the literature on the developments of theory of corporate finance over the past

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[14] Such as the taxation of dividends, debt instruments income and capital gains, either at firm and personal levels.

[15] One of the institutional features that permeates finance literature, as Demirgüç-Kunt and Maksimovic (1996, 47) accurately observe, is "the existence of liquid, well-functioning stock markets". Furthermore, one can not take it for granted, that dissimilarities in allocative functions of financial markets across countries do not exist. Hence, the degree of development of capital markets is, arguably, "one possible determinant of corporate financing choices that theory has overlooked."

[16] See, e.g., White (1996), Franks, Nyborg and Torous (1996) and Kaiser (1996) for comparative analysis on bankruptcy issues, among U.S. and some European countries.

[17] This view is recognized by Saá-Requejo (1996, 44), who studied the financing behavior of Spanish firms. He argues that "only by comparing the decisions taken by firms operating in different financial environments, can we full analyze the effect of these institutional features."

[18] Burgman (1996) and Shao (1995) also support this approach, explicitly recognizing interest in research on patterns of firm behavior in determining capital structures. Appendix 2.1 to Chapter 2 presents a summary of the empirical literature on capital structure.

[19] Using a sample of British, German, Japanese, and North American firms, tested Myers' (1984) Pecking Order Hypothesis.

[20] Examined patterns of financial structure in Japanese firms between 1980 and 1984.

[21] They developed a capital structure model in an international setting; that model recognized both corporate and personal taxes.

[22] This study looks, at an aggregated level, at the financial structure of non-financial sectors in a sample of industrialized countries. An emphasis is put on the implications in terms of the mechanisms for monetary policy transmission.

[23] A comparative analysis of German, Austrian, Spanish, French and Italian corporations during the period 1991-1993 to compare financial autonomy of European industrial firms.

25 years — predicts. He argues that "the continuing trend towards the globalization of business activities suggests that transnational considerations will become more important in the future." In fact the ever-increasing interdependence of world economies, of which the globalization and integration of markets and firms are only some of the most prominent and visible manifestations, justifies a greater deal of attention to the issues of the corporate financing structure in a transnational perspective. One way of attempting to achieve this goal is through the study of decision-makers' behavior in different geographical settings, aiming at having more than "at most, a limited understanding of firm capital structure and financing decisions" Dowd (1996, 38).[24]

There is also abundant evidence — both empirical and anecdotal — of a significant variance in firms' capital structures across time. For instance, Taggart (1985) and Merton Miller, who, in his Nobel Memorial Prize Lecture[25] acknowledged the "rise of corporate debt ratios generally in 1980's". Likewise, Opler and Hooks (1995) observed significant distinct patterns in the financing practices of corporations, mostly in the post World War II period.[26] A number of circumstances accounted for this trend. According to Baskin and Miranti (1997) the most instrumental of these were "exogenous events" namely "changes in tax and regulatory policies and political events" and from "reduced risk perceptions" induced by differences in information available to investors and managers.[27]

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[24] As noted by as Demirgüç-Kunt and Maksimovic (1994) "testing the models with data from economies with less developed financial markets and very different institutions provide a test of robustness of these models". On these grounds, Chen, Lensink, and Sterken (1998) argue that "a better understanding of the capital structure determinants in a relatively small yet open industrialized economy is essential not only for enriching empirical studies in this field, but also for the purpose of cross country asset evaluation" may be understandable.

[25] Presented, to the Royal Swedish Academy of Sciences in Stockholm on December 7, 1990. See Miller (1991).

[26] For this evolution the modernization of financial systems was of paramount importance. The scope of financial instruments available grew significantly during the last 25 years. Between the most prominent developments in this area on U.S. corporate financing were the so-called Leverage Buyouts (generally initiated from the outside of the firm), but also the voluntary recapitalizations or, as Miller (1992) call them "self takeovers."

[27] Divergences in objective functions and differential information endowments are common sources of the conflicts that characterize the relationship between capital market participants and firm's insiders. Contracting, monitoring agents' behavior and enforcing, are effective (and costly) ways of mitigating the risks associated with agents' opportunistic behavior and misalignment of principals and agents' goals.

Empirical regularities across (industrial) firms' financial structures are well documented in the literature. Among others, Bowen, Daley and Huber (1982), Boquist and Moore (1984), Damodaran (1997), and Megginson (1997), report similarities in choice of financial leverage[28] at the firm level. Castanias (1983), and Bradley, Jarrell, and Kim (1984), among others, found empirical support for the hypothesis of the existence of a positive correlation between leverage at the firm and the industry level.

1.3. CORPORATE CAPITAL STRUCTURE: NEW CHALLENGES FOR RESEARCH

Despite the voluminous literature produced on this subject to date, capital structure theory remains an unfinished work. Although we have some knowledge about some important aspects of long-term financing decisions by firms,[29] does not imply that we (1) capture the *entire picture*, or (2) we were unable to add to that body of knowledge. One approach suggested in the literature for extending our knowledge of corporate capital structure theory, is to investigate of the determinants of financial leverage in sectors that represent *polar-cases*, i.e., "extreme leverage choices" (Masulis 1988). That would be the case, per Masulis' argument, of banking firms, which are recognized in the literature to be highly leveraged.[30, 31] Other authors, (e.g., Dowd 1996), emphasize the usefulness of comparing financial structures of banks and non-financial firms. Dowd argues that the "traditional banking literature tends to overemphasize the difference between banks and non-financial firms, and therefore overlooks important similarities between them."

However, literature is generally rather cautious on its discussions of financial intermediaries' capital structure issues. In the *milieu*, it is not hard to find capital structure

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[28] Webster's New World Dictionary & Thesaurus define leverage as "to speculate in (a business investment) largely through the use of borrowed funds, or credit, with the expectation of earning substantial profits."

[29] What Stewart Myers called the *tactical level* of the capital structure problem in one of his interventions at the "Vanderbilt University Roundtable on the Capital Structure Puzzle" (1998).

[30] Throughout this work I will use the terms "banking firm," "bank," "financial intermediary," and "deposit institution" interchangeably. Because banking firm model prevalent in the U.S. and Portugal have substantive differences, both in terms of scope and scale, each is an entity that "(1) accept[s] deposits that the depositor has a legal right to withdraw on demand and (2) engages in the business of making loans" (from the 1970 Amendment to the Bank Holding Company Act of 1956).

[31] According to Flannery (1994a, 320) U.S. banks' equity capital equaled 6.5 percent of total assets at year-end 1990. For U.S. non-financial firms, that ratio was 55 percent, at the same point in time. These results are consistent with Lewis' (1991) report that "non-financial enterprises which for the USA and UK typically have ratios of equity capital to assets around 50 per cent, banks … are remarkably highly leveraged". Jensen and Meckling (1976) argue in the same direction in attempting to explain "why regulated industries such as public utilities or banks will

theory papers including cautionary reminders about the non-financial nature of its object. Usually, two main justifications are offered for the inclusion of such remainders. The first, is rooted in the notion that banks are regulated entities managed "under significant regulatory constraints on book capital that may restrict their capacity to change leverage" Damodaran (1999, 280). The second, is based on the separation between financing and operational/marketing decisions, which is contentious and raises measurement problems in the estimation of a banking firm's balance sheet's debt-financing.[32]

Miller (1995), asked the question "Do the M&M Propositions Apply to Banks?" Other observers of the North American banking *scene*,[33] like Orgler and Taggart (1983), have suggested that corporate capital structure theory — generally associated with non-financial companies — could be "a useful framework for analyzing bank capital structure." Thus, it is clear that there is still no agreement about whether capital structure theory is an appropriate theoretical foundation to rationalize the strategic financing behavior of banking firms'.

Another crucial issue underlies the scientific examination of the determinants of banks' capital structure decisions: the organizational model of the banking firm. The boundaries and the organization of bank's activities, and its institutional framework are decisive forces that — whatever perspective we may espouse regarding the theory of the firm — require careful examination in order to develop of a theoretical construct that could support an empirical investigation. This means finding an answer to the question: what banking firm model is most appropriate to conceptualize, characterize, describe and predict its capital structure decisions?

According to Sharpe (1995, 97) both theoretical and empirical literature has shown "considerable interest in … the determinants of capital structure of US banks." Several articles, among them, Peltzman (1970), Mayne (1972) and

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have higher debt equity ratios for equivalent levels of risk than the average nonregulated firm."

[32] Rajan and Zingales (1995) explain the elimination of financial intermediaries from their sample arguing that "their leverage is strongly influenced by explicit (or implicit) investor insurance schemes such as deposit insurance. Furthermore, their debt-like liabilities are not strictly comparable to the debt issued by non-financial firms. Finally, regulations such as minimum capital requirements may directly affect capital structure."

[33] See, Dietrich and James (1983), Santomero (1984), Chen and Mazumdar (1994), Wall and Peterson (1996).

Mingo (1975), looked at the financing structure problem of banks but focus primarily on the effects of regulation and supervision activity on capital adequacy requirements.

Other investigations that look into the problem of banking firm capital structure include, among others, Orgler and Taggart (1983), Wall and Peterson (1987, 1988), Wall and Peterson (1991, 1996) Flannery (1994), Osterberg and Thomson (1996). However, the focus of these studies is not the investigation of banks' discretionary capital structure choice.[34] On this perspective Marcus (1983), Arshadi (1989), Cornett and Tehranian (1994), Sharpe (1995), Cornett, Mehran and Tehranian (1996, 1997), and Hasan (1997) are among the mainstream of the relevant literature.[35]

The majority of studies in this area of the banking literature are based on data from U.S. banking firms. One exception is Sharpe's (1995) examination of the determinants of capital structure of Australian trading banks.

Despite these significant research efforts "The bank capital structure debate" to use the words of Chen and Mazumdar (1994, 284) "remains unresolved."

From this preliminary and necessarily contained literature examination, we conclude that the problem of banks' capital structure decision is a promising topic for further scientific inquiry. It offers an opportunity to formulate interesting research questions about the capacity of corporate capital structure theory to explain and predict the strategic financing decisions of banking firms.

1.4. Motivation, Purpose and Objective of the Investigation

The object of this research is the study of the determinants of capital structure decisions by Chief Executive Officers (CEOs) of Portuguese bank during the decade 1989-1998. Building on previous theoretical and empirical literature, a conceptual framework is developed to identify and explain the motivations of capital structure decisions by those executives. To empirically test the ability of current capital structure models in explaining the Portuguese banks long-term financing behavior during the 1989-1998 period, CEOs of chartered Portuguese banks operating were surveyed.

Because the surveyed CEOs run firms that are regulated entities, namely in terms of their capital bases, their capital structures decisions are variously voluntary and

[34] Banks may be compelled to take (involuntary) capital structure decisions in order to comply with mandatory capital adequacy requirements.

involuntary.[36, 37] The former takes the form of the standard security offerings. The latter type is determined by regulatory constraints that aim to eliminate any gap between a bank's capital condition and the prevailing capital adequacy requirements.[38] Although the importance of involuntary capital structure decisions is recognized, we confine our investigation to the voluntary capital structure decisions made by Portuguese banks' CEOs.

The importance of empirically testing corporate capital structure hypotheses in a specific geographical setting seems logical as a means to extend their explanatory and predictive power. That is the purpose of this research. We focus on a different geographical reality while at the same time empirically analyzing the determinants of Portuguese banks' financial leverage.

As shown in an interesting paper by Barth, Nolle and Rice (1997) banks in North America, United Kingdom and Japan are arguably different from their counterparts established in continental Europe, in a number of important of dimensions. The most significant differences relate to banking market structures, the scope of lawful banking activities, regulatory structure, deposit insurance schemes, and supervisory practices. Many of these differences surface in any comparison of the U.S. and Portuguese banking systems. First and foremost, the market structures are different. In Portugal there is a much smaller number of banking market participants. Secondly, the process of liberalization and deregulation of the Portuguese financial system[39] only gained momentum in the late 1980s in the aftermath of joining the (at the time) European Economic Community in 1986. Thirdly, in Portugal, the *universal bank model* is the prevailing form of banking firm organization in contrast with the *bifurcated model* that has prevailed in the U.S., at least

[35] A discussion of this literature is included in Chapter 3.

[36] The rationale for the regulation of banking firms is related, typically, to the negative externalities associated to failures of banks in performing their crucial role as providers of liquidity to the economy and in administering the payment system. See Chapter 3 for a discussion in greater depth.

[37] See, among others, Cornett and Tehranian (1994) for evidence on US commercial banks wealth effects of voluntary and involuntary issuances of external equity.

[38] Mota (1994) analyzes descriptively the impact of capital adequacy regulatory framework on the Portuguese banking system.

[39] The Portuguese banking industry experienced dramatic structural change in the past 20 years. Following April 1974 political revolution, all Portuguese private banks were nationalized in 1975. New entries to the industry were severely restricted, and the management of banks and banking activity was heavily regulated. In the second half of the 1980s, and coinciding with the integration in the European Economic Community, a period of economic liberalization began to unfold, and the banking industry was reopened to the private investors. In 1989, a process of reprivatization was initiated. Financial markets that had been closed since the 1974 revolution were revamped and reopened in a new regulatory and operational framework.

until very recently.[40] Fourthly, banking activities of UE members are not bound by geographical restrictions.[41] Finally, the features of the Portuguese regulatory environment are different from those of the United States (e.g., deposit insurance rules).

The time frame under observation in this study, 1989-1998, represents additional challenges for research, because of the important events that unfolded, at both the firm and macro levels, during that decade. At the firm level, privatizations, hostile takeovers, mergers, others forms of restructuring, and internationalization, were among the phenomena that emerged in Portuguese banking. At the macro level, the consequences of global deregulatory trends were coupled with a process of compulsory restructuring dictated by the integration into the European community.

1.5. Methodology and Research Methods Issues

The amplitude of the debate and the magnitude of the disagreement over methodological issues involved in economic research has also permeated the emerging literature on corporate finance in general, and capital structure, in particular. One of the central issues of this problem is related to the fact that investigation of finance questions cannot follow the traditional scientific method since submitting hypotheses to repeated testing under strict control conditions is not feasible. Hence, if the context of the research problem cannot be experimentally replicated we must attempt to model it based on its idiosyncrasies.[42] This creates a number of concerns. The first concern relates to the ability of generalizing results from empirical research when such results were obtained using data, predominantly, from one geographical area. The second concern is associated with the dominant methodological paradigm in corporate finance empirical research.

It is generally agreed that theoretical models of capital structure incorporate a "large number of potential determinants of capital structure" (Harris and Raviv 1991). However, we must recognize that the empirical evidence has not

[40] Boyd, Chang, and Smith (1997) suggest that under the universal banking model "banks can make equity investments as well as loans, vote their equity shares, and even hold seats on the boards of directors of non-financial firms. In general, they can be actively involved in all aspects of firm decision-making."

[41] In the United States, passage of Glass-Steagall Act of 1933 restricted investment-banking activities to commercial banks. Also geographical restrictions, both at intrastate and interstate level, were in place. The former, constraining the ability of banks to branch within the state, was gradually but cautiously liberalized (Saunders 2000). Nevertheless, in 1995, nine U.S. states still had this type of restrictive branching regulation (Ibid.). Interstate restrictions were enforced through the McFadden Act of 1927 and its amendments. For a discussion of geographical restrictions see, among others, Saunders (Ibid.).

[42] See Chapter 5 for a broader examination of methodological issues in this framework.

yet validated their contextual relevance, and it is often a source of contradictory[43] results.[44] The method of scientific inquiry in corporate finance has also been a source of concern.[45] Some authors point out that few investigations take into account the behavioral features of managerial decision-making.[46] This may be viewed as a limitation in reflecting salient feature of agents' observed behaviors in model structures.[47] Since it is widely accepted that financial economics is concerned with the behavior of agents' in allocating resources (e.g., Fama and Miller 1972), it is arguable that empirical research designs should incorporate this aspect. This suggests a greater emphasis on the use of field-based methodologies in corporate finance investigations.[48] The aforementioned arguments were instrumental in shaping the research design of this investigation.

1.5.1. Research Design

Given the empirical setting of Portuguese banks, we decided that a survey-based research was an appropriate method to collect data for this investigation, and represented an uncommon opportunity to convey, understand and rationalize the managerial perspective of actual banks capital structure decision-makers. To that end we designed our survey aiming at mitigating some of potential debilities associated with this specific research method in order to enhance the significance of our results and findings. We conducted the survey via person-to-person interviews (supported by a detailed questionnaire) with the aim of achieving a high response rate and thus minimizing non-response bias. This survey design also contributed to eliminate the potential for response-

[43] Opler and Titman (1996) give an example: "in dynamic models like Fischer, Heinkel and Zechner (1989), a firm issues equity after its share price declines and repurchases equity after its share prices increase to adjust towards an optimal capital structure. […] existing research indicates that firms actually do the opposite."

[44] Frankfurter and Philippatos (1992) argue that the "weak correspondence to facts" is a non-trivial problem of corporate finance theory. Different factors, such as, identification problems, measurement problems, and model mispecification problems are often identified as potential contributors to this problem (see chapter 5 for further details).

[45] See, among others, Frankfurter and Philipattos (1992), and Frankfurter and McGoun (1996).

[46] See, e.g., Simon (1997). Chapter 5 gives a closer look into this question.

[47] A standard example relates to the difficulty in specifying (problem-free) empirical tests having the ability to account the influence of behavioral factors such as divergences in stakeholders' objective functions or opportunistic behavior due to differentially informed parties.

[48] Interestingly, two of the most enduring and influential contributions to corporate finance theory, John Lintner (1956) and Gordon Donaldson (1961) hypotheses on dividend and financing corporate policies, respectively, were both obtained in field-based investigations.

bias.[49] The target population of the survey was defined as the CEOs of all the banks incorporated as autonomous entities under the Portuguese law that were in office during the period 1989 to 1998 for, at least, two consecutive years.[50] Because we were surveying the whole population we can presume that *sampling bias* is not a problem.

The use of field-based research methods in this area was recently advocated in a conference organized by the Harvard Business School and sponsored by the Journal of Financial Economics.[51] The author anticipates that information collected directly from bank CEOs may provide an important opportunity to understand the perspective of decision-makers in determining bank capital structure.

1.6. Objectives and Organization of Dissertation

The main objective of this dissertation is to contribute to the capital structure theory. It also aims to extend the literature review, incorporating more recent contributions, particularly, empirical findings from non-U.S. locations. Empirical testing of capital structure hypotheses in an uncommon corporate and geographic setting, and using a survey-based method, can improve our understanding about of the explanatory and predictive power of existing hypotheses.

To the best of the author's knowledge no other research study has attempted to exam capital structure decisions in the banking field using a similar research design. Also research on capital structure and banks strategic financing in Portugal is very scarce.

A better understanding of the determinants of banks' capital structure would be helpful for future developments in a (comprehensive) banking firm capital structure theory. Moreover, it can offer an opportunity for banks' stakeholders — investors, customers, regulators, managers, policy-makers — as well as academics and practitioners to better understand the thinking behind banks' strategic financing behavior. Lastly, the author's expectation is that this study increases the awareness of the importance of capital structure decisions, and stimulates future research and debate at academic, industry, and policy-making levels.

The study itself is organized as follows. Chapter 1 has offered an introduction to the

[49] The anomaly arising from having someone not belonging to the target population filling out the questionnaire.

[50] The CEO population was identified through an examination of banks' annual reports.

problem of capital structure decision and has framed it in current mainstream of theoretical and empirical literature. It also identifies the motivation of the research, gives a brief discussion of some methodological concerns, and presents the rationale for the research design choice. The objectives of the study, as well as its contributions, and the structure of the dissertation close the chapter. Chapter 2 presents a discussion of corporate capital structure theory. A review of relevant findings of empirical literature in the field, including evidence from non-U.S. firms and results from survey-based papers on capital structure research is appended to this chapter. Chapter 3 discusses the theory of banking firm capital structure. This discussion creates the foundations for formulating the hypotheses included in the survey questionnaire. Chapter 4 describes briefly the Portuguese banking system and provides analysis of 1998 performance of a sample of 43 banks operating in Portugal. Chapter 5 discusses some methodological problems related to corporate finance empirical research. It also addresses the research design, survey development, administration underlying the author's investigation. Finally, it presents the theoretical model used to develop the questionnaire, the data and the findings of the investigation. Chapter 6 presents a summary and final conclusions as well as suggestions for future research. ■

[51] Conference on "Complementary Research Methodologies: The Interplay of Theoretical, Empirical and Field-Based Research in Finance" held at the Harvard Business School on July 8-9, 1999. See Chapter 5 for further details.

Chapter 2

Firm's Capital Structure Theory

CHAPTER 2 - Firm's Capital Structure Theory

> For a long time after the publication of Modigliani and Miller's (1958) classic paper there was a dearth of coherent explanations of the firm's choice of capital structure; there is an abundance of alternative theories today.
>
> Patrick Bolton, *The Theory of Organizations: Discussion of Harris and Raviv, and Tirole*

2.1. INTRODUCTION

The primary purpose of this chapter is to discuss of the central building blocks that shape capital structure theory. Here the discussion of theoretical and empirical literatures is treated separately.

Because the literature on capital structure is remarkably broad, an exhaustive review is beyond the scope of this work and will not be attempted.[52] Instead we build on previous research, review the more influential theoretical papers and attempt to interweave them in a manner that produces a coherent picture of the capital structure theory as it stands today. We will also highlight major unresolved questions.[53]

Finally, this examination of the literature concentrate on the choice between debt and equity financing ignoring, for the sake of parsimony, the possibility of issuing hybrid-financing instruments.

This chapter has fourteen sections. The first looks into some of the relationships between financing activity and the theory of the firm. The second section gives a perspective on the theory of finance and firm financing behavior. Section three examines the capital structure decision problem in a "perfect markets" setting, and makes a "digression" on the capital structure irrelevance controversy. Section four outlines the implications of relaxing the taxless economy and riskless debt assumptions. The impact of

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[52] For enlightening surveys of both theoretical and empirical corporate literatures on capital structure, see among others, Myers (1977), Masulis (1988), Copeland and Weston (1988), Harris and Raviv (1991), and Megginson (1997). Cools (1993) reviews empirical literature until the beginnings of the 1990s. Among them, Masulis and Harris and Raviv's analyses are, most probably, the more acclaimed. Albeit their comprehensiveness neither of them is a *complete* survey of the literature. The former is naturally somewhat dated concerning empirical literature and theoretical contributions. In what the latter is concerned, its authors (arguing with their noncompetitive advantage) explicitly and "[a]rbitrarily exclude [from their review] theories based primarily on tax considerations" as a major determinant of capital structure choice.

[53] The literature that relates to the issues of banking firms' capital structure is discussed in Chapter 3.

the agency conflicts and differential information on the capital structure decision comes next. Finally, we examine the influence of corporate governance and product-market considerations on the debt/equity choice problem. This sequence of topics has two purposes: (1) to "isolate" the impact of each determinant of the *capital structure equation*; and (2) to show the interaction of different determinants and the need of an integrative approach. In Appendix 2.1 we included a table containing a summary of a number of empirical studies to substantiate both the explanatory and the predictive relevance of this discussion of the firm's capital structure theory.

2.2. FINANCING IN THE CONTEXT OF THE THEORY OF THE FIRM

Physical capital — both productive and managerial resources — is pivotal for the fulfillment of the productive function of the firm. To acquire this essential capital, however, the firm must devise effective ways of attracting *financial capital* it needs to fund the real assets required by its investment opportunities and current operating requirements (e.g., Arrow 1974).[54]

Unfortunately, as suggested by Jensen (1983), this (neoclassical) theoretical perspective of the firm[55] "is not a positive theory of the firm, but rather a theory of markets" and therefore it is of little help in deriving implications for firm financial behavior.[56]

According to the *neoclassical paradigm* the firm is viewed as a production function (a *black-box*)[57] in which "there are no 'people' problems or information problems" (Jensen 1983). In this view the neo-classical firm is portrayed as a single economic agent (or a unanimous group) whose actions follow specific and pre-determined decision-making criteria.[58] Moreover, by (implicit or explicit) assumption, these agents

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[54] This model is consistent with the standard economic theory, which portrays the firm as a potential investment opportunity set, from which some projects are chosen. In this framework, as pointed out by Milgrom and Roberts (1992), among others, "the questions to be studied concern which investments ought to be undertaken, how the funds needed to pay for the investments ought to be raised."

[55] For a comprehensive review on the theory of the firm see, e.g., Holmström and Tirole (1989).

[56] According to (Jensen 1983) "research based on this model has no implications for how organizations are structured or how they function internally."

[57] Gavish and Kalay (1983) provides a similar view observing that "the firm as been viewed as a black "black box," namely, as one homogeneous unit whose clear objective is to maximize its market value." Additionally, as pointed out by (Hart 1995) the neoclassical theory of the firm ignores all incentives problems within the firm.

[58] As noted by Auerbach (1992, 475) the neoclassical theory of economics "does not distinguish managers from owners."

have free, complete and perfect information for their resource allocation decisions. However, the way neoclassical theory rationalizes the firm fails to account for important aspects of real world economic behavior by firms.[59] Hart (1995) identifies three main weaknesses of the neoclassical paradigm these relate to: (1) its unawareness of the firm's (endogenous) incentive problems; (2) its "silence" about organizational issues;[60] and (3) the absence of a convincing explanation for firm boundaries.[61] This suggests that we need a more robust theoretical framework, one that helps us to explain the financial behavior of actual real-world firms.

An alternative paradigm for that purpose is the so-called *contractual theories* of the firm. Although they differ — sometimes substantially — they all agreed on the importance of *property rights*,[62] asymmetric information, and some behavioral assumptions that extend the usual self-interest assumption — such as 'opportunism' or 'moral hazard'. Absence of such notions renders worthless potential explanations of why there should be firms in a market economy. In fact, the combined notions of property rights (and therefore incentives), asymmetric information and extended self-interest are recognized as *necessary* to rationalize the existence of firms in a market economy.

Economic conceptualization of the firm as a *nexus-of-contracts* is an insightful approach pioneered by Coase (1937) and more recently suggested by Alchien and Demsetz (1972).[63] This *nexus-of-contracts* view of the firm has received so widespread support

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[59] We may look at a firm from a broad range of theoretical perspectives, such as: an investment vehicle, a production function, a nexus of contracts, a trade-off between the costs of transacting and the costs of contracting (a choice between market and hierarchy), agency theory, incomplete contract approach and probably an handful more (e.g., Williamson 1985, Alchian and Demsetz 1972, Holmström 1982, and Grossman and Hart 1986). Besides their disagreements, these theories share a common contractual base, and an emphasis on the importance of property rights, asymmetric information, and some behavioral assumption that extends the usual self-interest assumption (such as 'opportunism' or 'moral hazard'). Interweaving the notions of property rights (and therefore incentives), asymmetric information and extended self-interest is crucial for explaining why there are firms in a market economy.

[60] Arguing in the same direction, Jensen (1983) contends that because in the neoclassical model of the firm "there are no 'people' problems or information problems, […] as a result the research based on this model has no implications for how organizations are structured or how they function internally."

[61] For a similar point of view see, among others, Salanié (1997, 1) who argues that "strategic interactions between agents indeed are heavily constrained in that [general equilibrium] model." He also contends that "the very existence of firms is difficult to justify in the context of general equilibrium models, since all interactions take place through the price system in these models."

[62] See, e.g. Hart (1995 for an excellent discussion of the property rights approach to the theory of the firm. Furubotn and Pejovich provide a synoptic although somewhat dated survey of this literature.

[63] In *Webster's New World Dictionary & Thesaurus* nexus is "a connection, tie, or link between individuals of a group, members of a series, etc."

(e.g., Milgrom and Roberts 1992; Jensen and Smith 1985; and Jensen and Meckling 1976), that Allen and Winston (1995) claim that it is the dominant paradigm in modern corporate finance. In their meticulous examination of Coase's argument, Jensen and Meckling (1976) fully develop the concept that a firm is a "legal entity that serves as a nexus for a complex set of contracts (written and unwritten) among disparate individuals."[64] The conceptual foundation of this theory, a corporation, is a legal entity embodying a network of a far-reaching and complex set of (explicit and implicit) contracts among disparate stakeholders.[65] The notion that firms are *legal fictions*[66] characterized by a system of bilateral contracts is increasingly well established in economics.[67] The ability to enter contracts (as well as reforming, redesigning, and abandoning the organization by rearranging contractual terms) is critical to one of the major approaches to the economic analysis of organizations. Jensen and Meckling (1976) are particularly emphatic about this "essential contractual nature of firms."

Thus, in terms of the economic theory of the firm most scholars now recognize the pivotal role of the intricate and massive web of contractual commitments that firms enter into, and the role that these commitments perform in the co-ordination of individual economic and productive inter-relationships.

This *contracting approach* to *organization theory* emphasizes the voluntary nature of people's involvement in (most) organizations, and assumes that markets and hierarchies are just two extreme forms of organizational contracting.[68]

Ownership is one fundamental element of the network of contractual relationships that nurtures the concept of firm.[69] Economists, in their analyses of firm ownership[70] have,

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[64] See Williamson (1990) for a general discussion.

[65] A similar view is supported by Zingales (1998) for whom "the corporation, in principle, is just an *empty legal shell*" (emphasis mine). In the same direction Milgrom and Roberts (1992) claim that "[o]ne theory views the firm as a legal fiction – a contracting entity that serves to economize on the number of bilateral contracts that are needed to coordinate activity."

[66] Jensen and Meckling (1976) conceptualize *legal fiction* as "[…] the artificial construct under the law which allows certain organizations to be treated as individuals." In the same vein, Williamson (1990) arguing that the notion is "somewhat broader," offers the view of a firm as a *nexus of treaties*. John and Senbet (1997) propose a *network of contracts*.

[67] This notion is also shared by Blair (1995) who asserts that "corporations are legal devices for assembling and organizing capital, labor, and other resources to produce and sell goods and services."

[68] Market-oriented organizations are characterized by voluntary bargaining, while hierarchy–based organizations are characterized by strict lines of authority.

[69] A manifestation of the importance of ownership, as argued by Stiglitz (1989) "is that the market puts a value on control. In some instances there are two kinds of shares that

typically, focused their attention on two key issues: (1) the allocation of residual rights of control[71] and (2) the appropriation of residual returns (e.g., Milgrom and Roberts 1992; Hansmann 1988). One reason for this particular emphasis may be related to the argument put forward by Hart (1995), who suggests that ownership provides more power[72] in an economic relationship since it grants all residual rights of control.

Moreover, and as explained in Jensen and Meckling (1976), it is the "specification of individual rights [that] determines how costs and rewards will be allocated among participants in any organization." However, and because that very specification is shaped — either implicitly or explicitly — in a contractual arrangement, the "individual behavior in organizations, including the behavior of managers, will depend upon the nature of these contracts" (ib.).

If ownership can be associated with holding residual control, then its importance must derive from the difficulty of writing contracts that, *ex ante* and comprehensively, stipulate all these control rights, as well as payoffs and penalties for each contracting party.[73] In this environment, and further assuming that it is both inexpensive and effortless

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are identical in their claims on the profits of the firm, but one of which is nonvoting (or has fewer voting rights). These shares often sell at a large differential."

[70] Hart and Moore (1990) and Grossman and Hart (1986) have provided some important contributions — generally known as the *property rights* paradigm. Their view of the nature of a firm's ownership is consubstantiated by the right residual control rights owners have over the use of the firm's non-human assets. In this approach, ownership is synonymous with control. Contrastingly, Berle and Means (1932) implicitly define ownership as claims on residual cash flows. In Grossman-Hart-Moore's approach shareholders are the "owners" because they have the voting power to determine how assets are deployed, whereas for Berle and Means shareholders are the "owners" because they have the rights to residual cash flows.

[71] That is having the right to make any decisions concerning the asset's use that are not explicitly controlled by law or contractually assigned to another part (see, among others, Grossman and Hart (1986).

[72] Because of ownership rights' diffuseness a significant amount of both power and rents is concentrated at the top of the organizational hierarchy of the firm (Rajan and Zingales 1998). Berle and Means (1932) conceptualize owning and controlling a firm as an expressive array of highly specialized non-human assets. Thus, ownership of *unique* non-human assets is, perhaps, the primary source of power in the corporation. However, in market economies, ownership is offered legal protection in the sense that the owner also is given the right to specify how the asset should be used in situations not covered by voluntary contracts. "This may seem inconsistent, […] with the view that power should refer to the rights of control over resources that are not specified in voluntary contracts. The apparent inconsistency is resolved when we recognize that contracts are typically incomplete, and do not specify rights and duties in all contingencies. The law, however, through some legal mechanisms, offers parties control rights in eventualities that are not covered through contract" Rajan and Zingales (1998).

[73] A plausible explanation for this inefficiency, not usually accounted in the literature, relates to the *bounded rationality* faced by economic agents in their decision-making. Williamson (1990) supports this view arguing that "[g]iven bounded rationality, all complex contracts are unavoidably

to write and enforce a *complete contract*,[74] then there would be no unforeseen contingencies. Therefore, no eventualities (for which plans had not been prepared) would occur unexpectedly. Likewise, no unpredicted adverse outcomes would ever happen, and no difficulties would arise in ensuring that the contracted actions (and distribution of income) would materialize. In this particular set of circumstances, residual rights would be totally meaningless. In addition, because no rights would be left unspecified, *everything* would become residual.

However, if the contracting parties could costlessly write a non-renegotiable contract contingent upon all possible states of the world and enforceable, for instance, in a court of law,[75] then the allocation of power in such contractual relationship would be a matter of irrelevancy. As a matter of fact, if every contingency could be anticipated and unambiguously contracted in advance and fully enforced through the legal system, then there would be little room for the exercise of power. In such a world all relevant decisions would be made *ex ante*, and the allocation of power would have distributional consequences but no efficiency consequences.

But, as asserted by Williamson (1990), writing *ex ante* all-inclusive voluntary contracts did not prove to be an effective governing mechanism for economic relationships between parties whose transactions were contingent on some future state of the nature. Thus, the acknowledgement of this ineffectiveness may be at the origin of the considerable effort made to develop an *incomplete contract theory* over the past ten to fifteen years.[76]

One of the distinctive features of incomplete contracts is the intrinsically embedded uncertainty inherent to their very nature. This feature, being a source of serious concerns regarding the opportunistic behavior of parties (Bolton and Scharfstein 1998), represents a promising analytical tool for framing the financial contracting behavior of firms. Among

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incomplete." As a consequence *bounded rationality* is the "operative behavioural assumption out of which the economics of contracting increasingly works" (ib.).

[74] One that specifies what everyone is to do in every relevant eventuality at every future date and how the resulting income in each such event should be divided. Thus, an arrangement with the ability to explicit procedures governing the behavior of contract participants in determining outcomes as well as the allocations resulting from those outcomes.

[75] Renegotiation would be superfluous any way.

[76] Although its development it is a contemporary endeavor, according to Hart (1988) the "insight that the firm as an institution takes on importance only in a world of incomplete contracts" has to be credited to Ronald Coase and Oliver Williamson. Hart and Moore (1998) and Bolton

other types of effects, incomplete contracts allow for ex-post *opportunism* in situations characterized by *asset specificity*. Furthermore, they raise the possibility of *hold-up* problems when there are *relationship-specific investments* (Bolton and Scharfstein 1998; Klein, Crawford, and Alchian 1978).[77]

2.3. AN INCOMPLETE CONTRACT VIEW OF THE CAPITAL STRUCTURE PROBLEM

The theory of capital structure is concerned with why financial contracts appear in certain patterns and why these patterns differ across industries and across countries (Hart 1987). According to the traditional property rights school, capital structure is not a matter of indifference.[78] Financial instruments in its view confer residual rights of control in addition to rights to share the economic rents.[79] Thus, its primary concern has been the identification of ownership and control rights and the effects on economic efficiency when these two types of rights are separated. However, the property rights school has little to say about debt and the relative importance of debt and equity, since ownership rights are, by definition, vested in the owners of the firm and no distinction is made between control in different states of world.

As seen earlier, the *property rights school* recognizes that shares of corporate stock confer rights to both return streams and control. The *incomplete contracting perspective*, differently, emphasizes the state-contingent nature of control rights (i.e., contractual stipulations make the allocation of control dependent on a future state of the world). The foundation here is that contracts are necessarily incomplete, in that they do not stipulate the parties' obligations for every conceivable eventuality. Incompleteness gives rise to the problem of how to allocate control in situations not covered by the initial contract, the so-

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and Scharfstein (1998) proclaim similar viewpoints. For comprehensive and rigorous account of the *state of the art* in incomplete contracts theory, see Tirole (1999), and Hart and Moore (1999).

[77] The *hold-up problem* was firstly explained by Klein, Crawford and Alchian (1978) and Williamson (1975, 1977 and 1979). These authors emphasized the importance of asset specificity and contracting costs on ownership and business relationships, arguing that relationship-specific assets create the potential for "holdup" costs between the firms involved in the relationship. Hart and Moore (1988) hypothesized that the hold-up problem will lead to underinvestment. For a hold-up to occur two conditions are necessary, "[f]irst, parties to a future transaction must make non-contractible specific investments prior to the transaction in order to prepare for it. Second, the exact form of the optimal transaction (e.g., how many units if any, what quality level, the time of delivery) cannot be specified with certainty ex ante" (Rogerson 1992).

[78] For a rigorous, elegant, and illuminating analysis of this topic, see Hart (1995).

[79] Financial contracts returns' allocation is endogenously contingent on investment policy and operating decision-making. Also Harris and Raviv (1992) observe that financial contract designing encompasses both the "assignment of control rights as well as the allocation of cash flow."

called residual control rights. Indeed, control is void of meaning if all future actions and states can be specified *ex ante*.

Financial contracts are defined in the incomplete contract literature in terms of how they allocate residual control rights. Applying this theoretical framework to capital structure decisions of firms provides both a *descriptive model* and an *analytical tool*, with the potential to generate a number of interesting research hypotheses.

The standard financial instruments, debt and equity, are viewed through the incomplete contract "lens" as conferring rights to both control over managerial decision-making and cash flow streams. Thus, looking at the firm's capital structure decisions in an incomplete contract approach provides insightful views into the underlying corporate governance framework, which is essential for consistent allocation of residual control and claims. According to Berglöf (1990) "a firm's capital structure can be viewed as describing the allocation of risk and control among investors." Lastly, Garvey and Hanka (1999) suggest that "corporate managers have discretion over capital structure choices, as the firm's founding shareholders cannot write a comprehensive *ex ante* contract specifying all future financing decisions."

Another weakness of the traditional neo-classical paradigm relates to the role ascribed to investment in a firm's securities, which are viewed as *pure financial assets* void of any underlying power of economic decision which, *autrement dit*, is not regarded as an *economic good*. This view is supported by Milgrom and Roberts (1992) who contend that "the classical theory regards financial securities as claims on streams of net receipts whose magnitude and variability are exogenously given." Berglöf (1990) is another example of the wide support provided to this criticism of the neo-classical paradigm: "in modern finance literature *à la* Modigliani and Miller (1958) […] financial instruments only entitle their holders to return streams."

However, if we want to build a corporate financing framework with the ability to explain financing behavior of actual firms, we do have to incorporate the notion that an equity

instrument grants property rights over the actions of corporate governance of the firm, and establishes a mechanism for the transfer of corporate control (Cobbaut 1994).[80]

2.4. FINANCING IN THE CONTEXT OF CORPORATE FINANCE THEORY

Firms have been making financing decisions for a long time, and financial economists have shown a great deal of interest in understanding the supply and the demand of the array of financing instruments issued by firms.[81]

The sources of financial capital required to fund the acquisition of risky assets needed to implement competitive and operational firm strategies are both internal and external. The former depends on the firm's ability to generate cash flows and the rate at which it retains it, and therefore reflects the firm's dividend payout policy.[82] The latter (external financing) is provided by investors who acquire equity and debt securities[83] through the capital markets and financial intermediaries[84] receiving, in return, residual claims on future cash flows streams, and management control rights.[85] Thus, issuing securities is, simultaneously, a source of capital and a process for exchanging the economic agents' different profiles of (intertemporal) consumption and investment, determining (as a *by-product*) securities' aggregate demand and supply.

Equityholders[86] receive shares of stock in exchange for their financial investment on the firm. As previously noted, these securities (within a limited liability environment)[87]

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[80] Those rights tend to be *residual* because the actions its holders may actually undertake are constrained, among other things, by the law, and other parties' rights.

[81] As noted by Auerbach (1992, 574), firms are making capital structure choices "dating back to the industrial revolution." Moreover, one of its most prominent characterizing factors — the (implicit) risk / return trade-off — was recognized by Adam Smith as early as in 1776 (Ibid.).

[82] Technically, internal equity financing, which is obviously provided by *existing* shareholders) is retained earnings. As Modigliani and Miller (1958, 266) observe, "as long as management is presumed to be acting in the best interests of the stockholders, retained earnings can be regarded as equivalent to a fully subscribed, pre-emptive issue of common stock." The preference, suggested by some authors (e.g. Myers 1984), for its prior exhaustion as a financing source, is rooted on an opportunity cost advantage over common stock issues derived from lower transactional and informational costs.

[83] Throughout this dissertation we use the terms security, financing instrument, and financial asset interchangeably.

[84] Actually, firms issue hybrid securities also with both features of debt and equity financial instruments. Thus, in addition to these two basic categories of claimants, there are others such as holders of convertible debentures, leases, preferred stock, nonvoting stock, and warrants.

[85] As pointed out by Jensen and Smith (1985, 98) "[t]he risks of residual claims are restricted only by limited-liability provisions, but even these provisions are not universal."

[86] Throughout this dissertation we refer to shareholders, stockholders, and equityholders as synonymous. The same applies bondholders, debtholders, and creditors.

entitle them to both a residual claim on the firm's cash flow and the ultimate control over its assets, if the firm does not default and after all creditors are fully paid.[88] Debtholders, in their turn, are contractually promised a specified return in non-default states, and a preemptive (risky) claim against the firm's assets in default states determined by the indentured provisions. Equityholders retain control of investment decision, while debtholders have no direct control except insofar as equityholder decisions are constrained by bond indenture provisions.[89]

In summary, financing a business firm may be viewed as a continuous process of contracting security issues, which are distinct in a number of ways. Among them, contractual arrangements related to investors' *returns*, *control rights*, and *ease of claim transferability*. Thus, differences among corporate securities are of paramount importance as they embody *property* and *corporate control rights*.

2.5. CAPITAL STRUCTURE THEORY

Prior to the seminal contribution of Modigliani and Miller (1958),[90] the mainstream literature on corporate capital structure was built "in large part on *ad hoc* theories and institutional detail" (Smith 1984), and was "largely institutionally oriented and a descriptive (in its broadest sense) subject" (Ryan, Scarpes, and Theobald 1992). Financial economists vacillated between several different approaches to valuation:[91] *the net income approach* (NI), the *net operating income* (NOI) approach, and the so-called *classical* (or *traditional*) approach.[92,93]

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[87] Limited liability is recognized as a distinguishing feature of corporate law, which is in its very nature a contractual device. For an extensive discussion of the limited liability mechanisms see, among others, Easterbrook and Fischel (1991).

[88] As accurately emphasized by Easterbrook and Fischel (1991) "[t]he distinctive aspect of the publicly held corporation — delegation of management to a diverse group of agents and risk bearing by those who contribute capital — depend on an institution like limited liability."

[89] According to modern economic theory, in a loan, the lender acquires a contingent claim, a promise by the borrower to pay an amount that can depend in any arbitrary, prespecified way on future events (Lacker 1991). In a debt contract, the payment is generally non-contingent in that the amount does not vary with future circumstances, such as the borrower's wealth. Of course a debt contract is contingent to the extent that the lender does not receive full repayment if the borrower defaults. Default is then of crucial importance for this type of financing arrangement (ib.).

[90] From now on I will use indistinctly throughout the dissertation, "Modigliani and Miller", and "M-M".

[91] What Karl Popper (1983) qualified as *ad hoc* theories.

[92] For the 'Net Income' model and the 'Net Operating Income' model see, e.g., Williamson (1982), or David Durand, "Cost of Debt and Equity for Business: Trends and Problems of Measurement," *Conference on Research on Business Finance*; New York: National Bureau of Economic Research, 1952 (also reprinted in Archer and D' Ambrosio 1967).

These traditional paradigms of corporate capital structure, were anchored on *common sense* arguments about the dividend capitalization rate, as a function of financial leverage (Cobbaut 1993). All predicted an *interior* optimal capital structure and a relationship between leverage and the value of the firm.[94]

Although recognizing this starting point, we share Taggart's (1985) view that "Modigliani and Miller's (1958) analysis of corporate capital structure is the logical place to begin." In their work, Franco Modigliani and Merton Miller made a formal proof — both logical and mathematical — that, under a specific set of restrictive and *artificial* assumptions, the capital structure decision of the firm was irrelevant to its market valuation. Inherent to this view was the belief that only decisions on the (real) asset portfolio had a determinant effect on a firm's market value.

To derive their celebrated theorem, Modigliani and Miller (M-M) started by assuming the presence of the assumptions that characterize the *perfect capital market paradigm*[95] Furthermore, they assumed the investment in the firm's assets invariant.

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[93] In a world with a taxless economy, the 'Net Income' approach hypothesizes constant interest cost on debt and equity capitalization rate, and prescribes an all-debt optimal capital structure, point of value maximization. The 'Net Operating Income' suggests independence between value, cost of capital and capital structure. The 'Classical' model supports the existence of an optimal capital structure, which minimizes the cost of capital specified as a U-function.

[94] For a discussion of this perspective see, e.g., Van Horne (1998), or Williamson (1982).

[95] Conceptualizes a capital market with frictionless demand and supply. For Beaver (1989, 50) "the concept of *perfect markets* means that (1) trading of commodities and claims take place at zero transaction costs, (2) no firm or individual has any special advantage or opportunity to earn abnormal returns on its investments, and (3) prices are invariant to the actions of any individual or firm." Megginson (1997) characterizes a perfect capital market as requiring: "(1) a large number of fully informed buyers and sellers, no one of whom has the power to influence market prices; (2) the absence of market frictions such as taxes, fees, information-acquisition or other transactions costs; (3) unanimity of opinion concerning the future value of asset prices, interest rates, and other relevant economic factors (this assumption is often called "homogeneous expectations"); (4) perfectly competitive product and factor markets that are always in equilibrium; and (5) costless and instantaneous market access for all potential buyers and sellers."
Copeland and Weston (1988, 331) require the following necessary conditions for perfect capital markets to hold: (1) "Markets are frictionless; i.e., there are no transaction costs or taxes, all assets are perfectly divisible and marketable, and there are no constraining regulations." (2) "There is perfect competition in product and security markets. In product markets this means that all producers supply goods and services at minimum average price, and in security markets it means that all participants are price takers." (3) "Markets are informationally efficient, i.e., information is costless, and it is received simultaneously by all individuals." (4) "All individuals are rational expected utility maximizers."
In a *circular fashion*, Brealey and Myers (1996, 462) quote a Ezra Solomon's comment saying, "a perfect capital market should be defined as one in which the Modigliani-Miller theory holds."

Besides the aforementioned (crucial) assumption of perfect capital markets,[96] to obtain their results, M-M also made use of (riskless) *arbitrage*[97] equilibrium conditions and of *risk class*[98] and *homemade leverage* concepts.[99, 100]

Although Modigliani and Miller derived three propositions: Proposition I (value proposition); Proposition II (cost of capital proposition); and Proposition III (investment decision proposition), the contribution recognized as the most important is Proposition I which states that:[101]

"The market value of any firm is independent of its capital structure and is given by capitalizing its expected return at rate ρ_k appropriate to its class."

Hence, within their environmental framework, M-M conclude that the capital structure of the firm has no relevance for its market valuation. Furthermore, they conclude there is no relationship between financing and investment decisions, which implies that financing and investment policies are independent,[102,103] and that internal and external financing are *perfect substitutes*.

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[96] Some authors, e.g., Milne (1975) and Ho and Robinson (1994), argue that there is also an implicit assumption of complete capital markets in the Arrow-Debreu sense. According to Beaver (1989, 50): "the concept on complete markets means that exist for all commodities or claims, and hence the market price for any commodity or claim is publicly observable." For a comprehensive discussion see, among others, Flood (1995).

[97] The practice of *arbitrage* in the marketplace by rational investors precludes two different assets in the same risk class and with equal expected returns, from selling at different prices (*Law of One Price*). For Hirshleifer and Riley (1992), *arbitrage* represents "commitments taking advantage of momentary price differentials over space or time, under conditions of market disequilibrium." For an authoritative discussion of the arbitrage concept in financial economics see, e.g., Varian (1987).

[98] If two firms belong to the same *risk class* then, they have similar pattern of returns across the states of nature and their expected risky operating cash flows should differentiate only by a scale factor. This implies a perfect positive correlation between the two cash flow streams.

[99] The concept of *homemade leverage* explains the process by which an individual replicates a firm's financial leverage offsetting any particular debt-equity combination. In Modigliani and Miller (1958) is assumed that, both individuals and firms, debt issues face the same riskless interest rate, with no discrepancies between borrowing and lending rates.

[100] In Bhattacharya (1988) viewpoint, the introduction of these concepts in the analysis of capital structure represents "key methodological contributions" of Franco Modigliani and Merton Miller.

[101] Copeland and Weston (1988), and Cobbaut (1994), among others, provide derivations of the Modigliani and Miller's propositions.

[102] According to Santos (1992) and Smith (1984), this result has been anticipated by Williams (1938).

[103] Under the same conditions we may argue that firm's real and financial decisions are independent, and consequently may be formulated separately. However, since the investment and operating or decisions are completely separable from the financing decisions, then a corollary follows the MM theorem, that corporate bankruptcy is inconsequential to the firm's value.

Using a *discrete time*/*discrete outcome* approach[104] the argument of Miller and Modigliani can be shown as follows: Let $X(s) \geq 0$, be the state contingent cash flows of a firm, and let D be, for the sake of simplicity, the outstanding face value of a single debt contract. Let Ω be a random variable denoting the set of all possible states of the nature and ω one of its elements, $\omega \in \Omega$.[105] It follows that in any state ω, the payoffs for the firm' equityholders can be defined as Max $\{X(\omega) - D, 0\}$, and the bondholders' payoffs as Min $\{D, X(\omega)\}$.[106] Therefore, the value of an unlevered firm (all-equity financed firm), V_U, is the value of the firm's equity when $D = 0$ can be represented by following *state price vector*:

$$V_U = \sum_{\omega} X(\omega) p(\omega),$$

where $p(\omega)$ is the price of a pure security,[107] which pays \$1 in state ω and \$0 otherwise.

For levered firm, V_L, the value its equity, V_{LE}, is then defined as:

$$V_{LE} = \sum_{\omega} \{\text{Max } X(\omega) - D, 0\} p(\omega),$$

and the value of its debt, V_{LD}, as:

$$V_{LD} = \sum_{\omega} \text{Min}\{D, X(\omega)\} p(\omega).$$

Because of the *Value Additivity Law*, we can determine the value of a levered firm, V_L, as the sum of the value of its equity and debt, i.e. $V_L = V_{LE} + V_{LD}$, or:

$$VL = \sum_{\omega} \left[\{\text{Max } X(\omega) - D, 0\} + \text{Min}\{D, X(\omega)\}\right] p(\omega) = \sum_{\omega} X(\omega) p(\omega).$$

Assuming an absence of arbitrage opportunities, the value of a levered firm equals the value of an identical but unlevered firm. This result shows that, in a taxless economy

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[104] Often denominated the *time-state paradigm* or the *Arrow-Debreu paradigm*, after the two authors who developed its basic characteristics. The "'time-state-preference' framework is a generalized version of that used in articles by Arrow, Debreu, and Hirshleifer" (Myers 1968).

[105] "A state of the nature is a complete description of the uncertain environment [...]" (Huang and Litzenberger 1988). Since the payoff of a financial security will depend on the state of the nature, and since investors do not know what it will be at the time of the investment, their payoff is uncertain.

[106] One way of incorporating uncertainty about the conditions of future periods, alternatively to a mean-variance framework, "is to say that one of a set of possible states of nature will occur at that time" (Myers 1968).

[107] Arrow and Debreu conceptualized a *primitive* security (a pure security, or a time-state claim) as a special kind of contingent contract (a contract "for delivery of goods or money contingent on the occurrence of [a] state of affairs) which provides one unit of money — or some notional commodity — at one date if and only if one of the many possible states of the world at that date obtains. A complete market is one in which all such claims may be purchased or sold explicitly or synthetically at stated prices.

with perfect capital markets, the only effect of capital structure decisions is upon the reallocation of cash flows among the firm's claimants, and therefore, the value of the firm is unaffected. Meanwhile, total cash flows remain unchanged.

2.6. THE CONTROVERSY OF CAPITAL STRUCTURE IRRELEVANCE

Despite its analytical elegance, rigor and scientific relevance, Modigliani and Miller's irrelevancy theory was received with some criticism. The central focus of that criticism was the implication that "*financial policy does not matter*."[108]

Authors, like (e.g.) Baskin and Miranti (1997) claimed that M-M's "underlying suppositions [...] are expressed as rules that state how the model's elements correspond to circumstances in the real world." This contention may well represent the primary source of debate caused by what some authors viewed as an oversimplification of the model's underlying assumptions versus the real world.

The relevant question to ask is whether or not M-M's set of assumptions are an accurate description of firms and markets in real world situations. Are these (so-called) simplifying assumptions "at such significant odds with reality that they invalidate the use of MM model as an abstraction from real-world operational behavior" (Archer and D'Ambrosio, 1972)? Several authors specifically addressed this question. Among them is Megginson (1997)[109] who very instructively contrasts environmental conditions in scientific inquiry between physics and finance, particularly in respect to systems frictions. Merton Miller (1992) himself came forward (perhaps a little too late) to answer that same criticism. And he did so with unquestionable elegance, acknowledging that "[t]he view that capital structure is literally irrelevant or that "nothing matters" in corporate finance, though still sometimes attributed to us, is far from what we ever actually said about the real-world applications of our theoretical propositions" (emphasis in the original). And he admitted that "[l]ooking back now, perhaps we should have put more emphasis on

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[108] See, among others, Durand (1959) and Brewer and Michaelson (1965).

[109] "Like the ideal gas laws of physics, the M&M model describes how a system will work without frictions, such as gravity in physics and transactions costs (brokerage fees, taxes) in finance. While this idealized world clearly does not reflect objective reality, it is possible to add elements of the 'real world' one by one and see how the theory's predictions will change until a working model of reality emerges."

the other, upbeat side of the "nothing matters" coin: showing what *doesn't* matter can also show, by implication, what *does*" (emphasis on the original).

Conceptually, perfect capital markets can be viewed as a *gravity-free* environment which allows us to exam financing decisions of firms unaffected by environmental frictions. Therefore, analyzing the capital structure problem in such conditions sheds light over the determinants that potentially underlie those decisions, i.e., taxes, transaction costs and other market frictions and imperfections.[110] Stewart Myers (1993) corroborates Miller's view, arguing that "it seems that financial leverage matters more than ever." He concludes that Modigliani and Miller practical message is "if there is an optimal capital structure, it should reflect taxes or some specifically identified market imperfections."

In summary, we can say that a firm's optimal capital structure can only exist in a world where market frictions and imperfections, which include transaction costs, asymmetric information and opportunistic behavior, are present. As pointed out by Ross' (1988, 127) the M-M analysis "was designed less to verify some mathematical truism than to capture a live and elusive scientific intuition."

2.7. EXTENSIONS TO MODIGLIANI AND MILLER'S (1958) MODEL

Although this thesis will not attempt of extend the Modigliani and Miller theorem, a self-contained digression on this theme is present for the sake of *completeness*.

As previously shown, Modigliani and Miller offered a formal proof that — under frictionless, perfect, and competitive capital markets — the value of a firm is independent of its capital structure; therefore its market value is unaffected by its financing choices. Despite the wide support for the theory (e.g., Ross 1988) the acclaim was not unanimous[111]

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[110] Forty years after the publication of their landmark paper (Miller 1998) addresses the real epistemological problem underlying the irrelevancy debate when he states that "the minute you start questioning the assumptions underlying a model you leave the world of pure logic behind. You have gone from deduction to induction, from an ideal world to the empirical world where terms like true or false no longer apply."

[111] Miller (1988) asserts that M-M theorem generated "three decades of intense scrutiny and often bitter controversy."

and some concerns with the framework required by the M-M's model were brought forward.[112, 113]

Not surprisingly, some authors made successful attempts to extending the M-M theory either by using a less stringent set of assumptions [114] (e.g., Baron 1974; Smith 1972)[115] or by a specifying different environmental framework (e.g., Stiglitz 1969). These generalizations show that under perfect competitive and frictionless markets, the irrelevance of corporate financing policy obtains even in the presence of risky debt and hybrid securities. Further, it is shown that the theorem also holds both in single and multiperiod setups, which makes the firm value unrelated to the structure of debt maturity, as well.

As discussed earlier, Modigliani and Miller based their propositions on a large set of assumptions. In addition to perfect and competitive capital markets, they assume the following: (1) risk class homogeneity; (2) no bankruptcy risk; (3) homemade leverage transactions;[116] (4) perfect, complete, and costless information; (5) a taxless economy; (6) perfect substitution between firm's and investors' borrowing; and (7) invariant scale of the firm's investment. These assumptions represent, as indicated in the literature, some of the major sources of concern. In 1969 Joseph Stiglitz undertook the formal proof that the M-M theorem obtains under more general conditions. Specifically, Stiglitz shows that, in a general equilibrium state preference framework, the validity of the theorem does not

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[112] See, e.g., Milne (1975), Lintner (1977), Mossin (1977), and Ho and Robinson (1994). For these authors the main sources of disagreement were essentially the assumptions required to obtain M-M's results.

[113] Mossin (1977, 83) provides an eloquent description of the reaction of M-M to theory: "such conclusions were naturally met with incredulity among financial practitioners and skepticism among their academic counterparts."

[114] Stiglitz (1969) provides his views on the limitations of the proof of Modigliani and Miller's theory: (1) it is conditional to the existence of risk classes; (2) seems to demand objective rather than subjective probability for outcome distribution specification; (3) develops within a partial equilibrium framework; (4) it is unclear if whether or not requires a competitive market setup; and (5) the theorem, under the presumption of firm's bankruptcy, appears to obtain only in specific instances.

[115] As Fama (1978, 272) observes a great deal of the controversy "centered in large part on which of the peripheral assumptions are important to the validity of the theorem."

[116] The arbitrage argument under an M-M setup develops within the following framework: assuming there are two firms belonging to the same risk class, with identical cash flow streams, firm *U* all-equity financed, and firm *L* financed with both equity and debt securities. Further is assumed that market valuation of firm *U* is higher than firm *L*. In this instances, buying the same percentage of the equity and the debt of firm *L* would be cheaper than buying the same fraction of firm's *U* equity, although both ownership claims entitled to identical amount of cash flow. Capital market would exposed this arbitrage opportunity and prices of both firms would be adjusted, upwards and downwards respectively, until reaching a new price of equilibrium, identical for both firms. Assuming now that firm *L* is overpriced in relation to firm *U*. Then with a portfolio of U firm's equity and borrowing (the so-called *homemade leverage*) an investor can replicate the return on

depend on the existence of risk classes,[117] on the competitiveness of the capital market, or on the agreement of individuals about the probability distribution of outcomes.[118] The author, however, acknowledges other assumptions as necessary conditions for his proof, namely that: (1) borrowing either by levered firms or by investors are perfect substitutes; and no-bankruptcy risk.

Stiglitz (1974) provides a more general proof of the M-M theorem, based on the presence of a costless financial intermediary that can reconstitute the firm and alter its financial leverage (as measured by the debt-equity ratio). Thus, the value of the firm must be unrelated to capital structure as long as a costless financial intermediary can be established to maintain the opportunity set available to individual investors. Under this framework, Stiglitz proves that individual wealth and consumption opportunities are unaffected by firms' capital structures. Moreover, he demonstrates that the finite probability of costless bankruptcy has no effect on the value of the firm.[119]

Vernon Smith (1972) also attempted to replicate M-M's results but under less restrictive conditions. He relaxed the assumption of riskless debt — i.e., assumed a positive probability of (costless) bankruptcy.[120] Additionally, he "focused on preferences of risk averse, expected-utility maximizing investors for various debt-equity ratios for firms." Smith's major focus was the assumptions that related to a positive probability of bankruptcy,[121] and to independence between the firm's cash flow and an invariant scale of firm's investment (which, in this formal setup is unavoidably "independent of capital market considerations"). The homemade leverage argument is proved to hold under a no-default risk premise. Otherwise, assuming a positive default risk on debt the theorem does

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Firm *L* but at a lower cost. (This strategy implies necessarily that investors are able to borrow personally in the same terms as levered firms).

[117] In a distinct though not unrelated perspective, Hamada (1971) showed that the assumption of homogeneous risk class is not necessary to derive the capital asset pricing model.

[118] Except that agents must on a zero probability of bankruptcy.

[119] This proof develops within a *general equilibrium* setting.

[120] Baxter (1967, 395) argues that the "risk of ruin" is equated as "a rising average cost of capital is perfectly consistent with rational arbitrage operations." "Allowing for the possibility of bankruptcy is tantamount to relaxing the assumption that the anticipated stream of operating earnings is independent of capital structure."

[121] According to Vernon Smith arising from the prospect of the rate of return on bonds becoming lower than the interest rate on debt. The likelihood of a (certainly high) degree of financial leverage could warrant this state.

not obtain.[122] Furthermore, in equilibrium, and allowing for unconstrained margin equity investments, individuals are not indifferent to financial leverage.[123] Lastly, it is demonstrated that if an individual margin investor is able to collateralize personal borrowing *only* with his shareholdings, then a putative lender will prefer to invest in corporate bonds himself, unless the personal borrowing rate exceeds the debt interest rate.[124] Smith's argument raises a number of issues. First, it brings out the important fact that return patterns for limited liability borrowing and lending depend on the composition of the portfolio that serves as collateral. If a firm goes bankrupt, pure equity collateral is worthless, whereas a collateral portfolio including some bonds might still earn a positive return because these securities have a privileged claim on the firms' remaining assets.[125] Second, it calls attention to the disincentive created by the increased exposure to default risk of individual investors when borrowing at the personal level versus acquiring debt securities of a levered firm. This becomes a disincentive for investors involve themselves in arbitrage, leading to different equilibria.[126]

Baron's (1974) paper discusses the effect of (1) abandoning the assumption of riskless debt (and therefore introducing a positive probability of default) and (2) assuming distinct (nominal) interest rates for the borrowing of firms and individuals.[127] In his derivation, Baron uses a stochastic dominance argument[128] to show that, provided investors and firms borrow in the same conditions or equity investors in levered firms also hold debt

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[122] Actually, investors "will prefer an increase or decrease in the corporate debt-equity ratio according to whether that ratio is greater or less than the investor's ratio of [debtholdings] to shareholdings."

[123] Investors, in equilibrium, will prefer an increase (decrease) in the corporate debt-equity ratio if his personal-account-borrowing rate is greater (less) than the corporate borrowing rate.

[124] Vernon Smith argues that a margin loan secured by a pure equity capital has a different return pattern from a direct loan to the firm and consequently they are not perfect substitutes as required by M-M's set of assumptions. See also David Baron. In a similar vein Stiglitz 1972.

[125] To illustrate his viewpoint the author discusses the case of a margin loan fully pledged with 100 percent equity securities. Within this arrangement, the return pattern of the loan is contingent on the firm's probability of bankruptcy, which in turn depends on the firm's financial leverage measured by its debt-to-equity ratio. If the firm's financial leverage rises, its probability of bankruptcy will increase, and the collateral will turn valueless.

[126] The differential in the exposure to default risk arises due to the absence of the limited liability feature when borrowing at individual level.

[127] His set of assumptions include: (1) stochastic gross earnings; (2) positive probability of bankruptcy, and as well as the probability of default on firm debt; (3) stochastic returns to scale; (4) investors are clustered around classes of expected-utility maximization; and (5) investors may (or may not) be risk averse.

[128] A risky asset *A* dominates risky asset *B* in the sense of (first degree) stochastic dominance, if all individuals having utility functions in wealth that are increasing and continuous either prefer *A* to B or are indifferent between *A* and *B*. For a formal discussion see, e.g., Copeland and Weston 1988, 92-95, and Huang and Litzenberger 1988, 39-55.

securities of the same risk class, "[t]he values of the levered and the unlevered firms will be equal if all economic agents are risk neutral." However, if risk aversion is present among investors and lenders, financial leverage may become relevant for the value of the firm.

Robert Merton (1974) produces a demonstration that the M-M theorem obtains even if the no-default risk assumption is relaxed. Further, he claims that, unlike Stiglitz (1969), his proof "did not require a specialized theory of capital market equilibrium (e.g. the Arrow-Debreu model or the Capital Asset Pricing Model) to prove the theorem when bankruptcy is possible."

In 1976 Baron rejoined the discussion to address the problem of the variability of the scale of the firm's investment. He then suggested that "if the financing-investment alters the space of available returns in the capital market, the implicit prices will depend on the firm's decision […]." Furthermore, he argues that whenever fixed-scale investment and financing choices do not affect available patterns of return in capital markets (and therefore security implicit prices) then investors "are indifferent to an alteration in the capital structure […], and the value of that firm is independent of its capital structure." Otherwise, shareholders of variable-sized firms (in terms of their total investment) are most likely to prefer more leveraged investments if, and only if, they enhance shareholders wealth.

Hagen (1976) reexamined Baron's (1974) proof of the M-M theorem under default risk. The major concern in his analysis appears to be the "assumption that investors are able to borrow at the same nominal interest rates as firms."[129] His underpinning arguments relate to the ability of investors who borrow to replicate the pattern of returns obtained by levered firms. If these investors can replicate firm returns, as Baron (1974) suggests, "lenders would be indifferent between lending to the investor and buying the risk bonds." This conjecture, however, does not ensure the validity of the theorem.[130] Although it is not questionable

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[129] However, as pointed out by the author "[i]t is not sufficient for the theorem to be valid that all equity investors in the levered firm also holds bonds in that firm, unless it would be optimal for each investor to hold the same fraction of the equity and bonds in that firm."

[130] To achieve such result "investors must be able to create any conceivable return pattern which the firm could have created itself by issuing different amounts of risky bonds, and for the lenders it must be immaterial whether these return

that, under the perfect capital market assumption, firms with similar cash flow streams should show identical market valuations, "this does not prove that the market values are independent of the way firms are financed."

Still other scholarly works have grappled with the M-M theorem and its many assumptions. Miller and Fama (1972), for example, demonstrate that the theorem "holds when debt is risky as long as stockholders and bondholders protect themselves from one another with [...] 'me-first-rules'." Later, Fama (1978) "shows that the me-first rules are also unnecessary."

Hellwig (1981) also examined the results of the M-M theorem in the presence of bankruptcy. He shows his doubts about the validity of the assumption of levered firms and investors borrowing in the same terms "when there is a positive probability that either the firm or the individual who borrows to invest in the firm goes bankrupt." As Hellwig points out, both, Stiglitz (1969) and Merton (1974) argued that M-M theorem holds under the presumption of no-default risk, provided investors have the ability to limit their margin borrowing liability to the collateral required by lenders. Additionally he observes what Smith (1972) hypothesized: that pure equity collateralized loans and straight loans to firms are not perfect substitutes because of intrinsic asymmetries in their return patterns. Whether or not this problem is relevant for the M-M theorem is viewed as an open question as far as Hellwig is concerned. [131]

Hellwig claims to identify "a gap in the standard proof of the M-M theorem." He argues that the arbitrage argument used by investors in adjusting their equity and debt security holdings in response to the firm leverage disregards other related securities, such as, the "[…] margin loans that serve to finance those margin investments." In his conclusions Hellwig emphasizes that the validity of the M-M theorem in the presence of a positive probability of bankruptcy depends on the composition of the margin borrowing collateral, and whether or not short selling is allowed. Therefore, he stresses that the conditions required for M-M theorem to obtain in the presence of bankruptcy "are so strong that the set of returns

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patterns are created by individuals or by firms." By modifying its capital structure the firm would simply "create an investment opportunity which is already available in the market and hence the feasible income space and firms' market values would remain unchanged."

[131] May be it "might be enough, if *some appropriate* margin loan could be used as a substitute for lending to the firm" (Ibid, italicized in the original).

patterns that are available to individual investors under these conditions is practically the same as in a complete system of contingent securities market." It is not surprising that these last considerations inspire a similar skepticism as the presumption that securities markets are *complete*.

More recently, Dybvig and Zender (1991) provided a proof of the M-M irrelevancy propositions (on capital structure and dividends) in the context of frictional markets. In their framework frictions arise because of the presence of differential endowments of information among market participants. Their proof requires the presumption that managerial compensation is chosen optimally.[132]

2.8. INCOME TAX EFFECTS ON FIRM'S CAPITAL STRUCTURE

As noted earlier, initial debate about the proposed irrelevance of firm capital structure focused on the assumptions of the Modigliani and Miller theorem and what would happen if these assumptions were relaxed. The first of the assumptions to be scrutinized was the absence of income taxation on costs of firms debt financing. Specifically, it was recognized that the tax-deductibility of interest payments were "potentially an important consideration in a firm's financing decisions" (Fama and French 1998) and incorporated in the capital structure problem.

In their former analysis (1958) Modigliani and Miller disregarded the effects of income taxes on firm financing behavior, implicitly assuming an economic environment with generic income tax neutrality in relation to equity and debt financing. However the observation of (real world) tax systems shows that fiscal neutrality does not prevail.[133] In the United States, for example, firms are allowed to deduct the interest payments they incur in using debt financing from their tax liabilities. Dividend payments to shareholders, however, are not deductible expenses. The income tax laws of a number of other countries share this same feature.

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[132] However, as argued by Fluck (1999, footnote 5), "the indifference result of Dybvig and Zender fails to hold if equity holders are granted the unconditional right to dismiss management."

[133] According to Swoboda and Zechner (1995, 767) "the tax systems currently adopted by most industrialized countries can be classified into classical systems and imputation systems." In the first kind of system, interest payments are tax deductible at the corporate level, whereas the dividends are not. At the personal level dividends and interest are taxed at the same rate. In the second kind, double taxation of dividends is reduce or eliminated by granting a tax credit to recipients of dividends equal to some fraction of the corporate tax paid on the dividends.
Examples of *Classical Tax Systems* are Australia, Austria, Belgium, Netherlands, Portugal, Sweden, Switzerland, and the US. Examples of *Imputation Tax Systems* are Canada, Japan, France, Germany, Greece, Italy, Norway, Spain, and UK. Source: Swoboda and Zechner (1995).

Typically, differential tax treatment of equity and debt securities creates an incentive for, under specific circumstances, a preference for debt financing.[134] A lack of neutrality in the taxation regime with respect to cash flow distributions to claimholders supports the development of a hierarchy of preferences in firm financing.[135] Thus if effective tax rates are exogenous and common at the firm and the individual levels, firms will tend to resort to the most tax-advantaged source of financing. The peculiarities of this behavior seem to be closely related to the idiosyncratic characteristics of particular tax systems.[136]

In 1963, Modigliani and Miller *corrected* their 1958 paper waiving the presumption of a taxless economy, and deriving a *corner solution* for the firm's optimal capital structure problem, which leads to an unambiguous (almost) infinite debt-to-equity ratio. The kernel of M-M's arguments is that, by making interest expense tax deductible, the government is subsidizing firms that finance their operations and projects by issuing debt securities. Therefore, *ceteris paribus*, firms would try to maximize their share of the government subsidy when choosing their capital structure.

Thus, when income-tax deductibility of interest payments at the firm level is present, the market value of the firm is an increasing function of its financial leverage. Therefore, the value of the firm is maximized with an all-debt capital structure.

As Modigliani (1988, 152) points out, M-M's (1963) result rests on the assumption that the tax saving stream[137] "is constant, perpetual, and absolutely certain like the coupon of a government bond." Modigliani and Miller recognized that "some uncertainty attaches [...] to the tax savings." The sources of this uncertainty, according to them, are (1) the likelihood of future changes

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[134] According to Faig and Shum (1999, 144) an "asymmetric corporate tax system is one in which the government does not treat firms' gains and losses equally." The recent decision of US government disallowing interest deductibility on very-long-term bonds (maturities of 40 and more years) and reclassifying them, for tax purposes, as equity is an example of reducing tax asymmetries between debt and equity securities.

[135] See, e.g., DeAngelo and Masulis (1980), Miller (1977), Stiglitz (1973), and Modigliani and Miller (1963). For more recent discussions of the tax effects on firm's investment and financing policies see also Faig and Shum (1999), and Gentry and Hubbard (1998).

[136] According to structure of U.S. Tax Code prior to the 1986 Tax Reform Act, internal equity (retained earnings) was tax-advantaged over new share issues.

[137] $\tau_c r D$, where τ_c stands for the firm's income tax rate, r the interest rate on debt, and D the outstanding debt.

in tax rates, and (2) the possibility of an erosion (or even an exhaustion) of taxable income to offset interest payments on debt.[138]

A much more disturbing problem, however, is raised by the presumption that capital structure policy is a *once and for all* (fixed) decision on the amount of debt to issue. As Modigliani (1988) observe "[t]his assumption seems untenable in a world in which the movement of expected profit and size of the firm is widely supposed to follow something like a random walk (or a martingale)."[139]

Retaining the notation previously introduced to derive M-M 1958 results, let τ_c represent the marginal tax rate on corporate income. We assume moreover, as a simplifying assumption (but without loss of generality) that all payments to debtholders are tax-deductible. In this case the payoff to equityholders in state *s* can be represented as Max $\{X(s) - D,\ 0\}(1-\tau_c)$, and the payment received by the bondholders can be represented as Min $\{D, X(s)\}$. The value of an unlevered firm, *VU*, can be represented as follows:

$$V_U = \sum_S X(s)(1-\tau_c)p(s)$$

Further, the value of a levered firm can be represented as

$$V_L = V_{LE} + V_{LD} = \sum_S \left[\{\text{Max } X(s) - D, 0\}(1-\tau_c) + \text{Min}\{D, X(s)\}\right]p(s)$$

$$= \sum_S \left[\{\text{Max } X(s) - D, 0\}(1-\tau_c) + \text{Min}\{D, X(s)\}(1-\tau_c) + \text{Min}\{D, X(s)\}\tau_c\right]p(s)$$

$$= \sum_S X(s)(1-\tau_c)p(s) + \sum_S \text{Min}\{D, X(s)\}\tau_c p(s)$$

Therefore

$$V_L - V_U = \sum_S \text{Min}\{D, X(s)\}\tau_c p(s) \geq 0$$

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[138] Modigliani (1988) confirm that in his 1963 paper with Merton Miller they already made an allusion to "some limitations to the validity of the assumption, on account of the possibility of changes in the tax code as well as profits falling below contractual interest."

[139] *Martingales* and *random walks* are theories of the time-series behavior of asset prices. A *martingale* is a fair game (which, on average, and across a large number of sample provides an expected return on an asset equal to its actual return) where tomorrow's price is expected to be the same as today's price. The *random walk* theory predicts that there is no difference between the distribution of returns conditional on a given information structure and the unconditional distribution of returns. For further details see, e.g., Campbell, Lo and Mackinley (1997), Copeland and Weston (1988), and Huang and Litzenberger (1988).

But $\sum_{S} \text{Min}\{D, X(s)\}\tau_c p(s)$ is just the present value of the interest tax shield. This implies that the value of a levered firm is greater than the value of an otherwise identical but unlevered firm. The above expression shows that a firm's value increases as its leverage increases, therefore implying that the firm can maximize its government subsidy by maximizing its leverage ratio.[140]

This addition to the firm's market value resulting from incorporating debt financing in its capital structure will be approximated by $\tau_c D$, if the firm's unlevered cash flows are capitalized at the opportunity cost of capital relevant to their risk class.

The all-debt debt financing optimality condition[141] implicit in the M-M 1963 analysis represents a corner solution determining a *unique* capital structure, which is clearly contradicted by the empirical observation of financial leverage levels of real-world firms.[142]

As argued earlier, the economic benefit associated with the income tax relief granted to borrowing costs should induce firms to leverage to the hilt. However, firms display capital structures showing a *conservative* use of financial leverage[143] and this pattern of financing behavior is consistently observed across time, countries and industries. Myers 1984 coined the term the *capital structure puzzle* to describe the disparity between the theoretical predictions and the observed reality.

2.9. Capital Structure in a Firm and Personal Income Taxes Framework

Taxation has significant implications on capital structure decisions made by firms, both in theory and (to a lesser extent) in practice. But those decisions are not made in a vacuum; they are also affected by the decisions of the investors who supply the capital. What impact do tax rules have on their decisions?

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[140] In the absence of constraints on leverage ratios, this would imply that the firm would choose to be 100% debt financed, which would imply that it is 100% equity financed, causing it to lose its government subsidy.

[141] Typically, the first explanation offered in the literature for real-world firms not having an all-debt capital structure is rooted on the existence of nontrivial bankruptcy costs. This argument will be pursued later in this chapter.

[142] This observation show, however, a substantively contrasting panorama with M-M 1963 optimal capital structure theoretical prediction, suggesting that firms' financing behavior is at odds with the shareholders value-maximizing paradigm. See, among others, for international evidence, Delbreil et al. 1997, Rajan and Zingales 1995, Remolona 1990. Taggart 1985, e.g., provide U.S. evidence. See Appendix 2.1 to this chapter for a summary of some studies on this area.

[143] Parrino and Weisbach (1999), among others, argue that "[f]irms use surprisingly large amounts of equity in their capital structures even though the deductibility of interest payments at the corporate level gives debt a tax advantage over equity."

In his 1977 Presidential address to the American Finance Association, Merton Miller provided an answer to this question. In this important contribution to the capital structure theory he extends the M-M's' 63 model by incorporating income taxes at the individual investor level and develops an equilibrium analysis of firm's optimal capital structure policy. He called attention to the dissimilar treatment of debt and equity securities at the level of personal taxation, and questioned the importance attributed to the firm's income tax deductibility of the cost of debt financing.[144] In his study, Miller reinstates the capital structure irrelevancy proposition but at an aggregated level. He shows that one firm's capital structure is irrelevant for its market valuation under the assumptions of (1) riskless debt; (2) no transaction costs; (3) and no taxation for equity income. He offers the explanation that the corporate tax advantage of debt is exactly offset by personal taxation of interest income. His argument develops as follows: the ability to deduct interest expense when computing taxable income at the firm level provides a subsidy for issuing debt securities. On the other hand, individual investors pay higher effective taxes on interest income than they do on income from owning equity. This disparity results from the lower tax rate on capital gains, as well as the ability of investors to defer the realization of capital gains.[145] Thus, at the individual level, there is a subsidy to owning equity, making it preferable for investors to invest in equity. To induce investors to invest in debt, firms have to pay investors a higher return on debt than on equity, i.e. they must concede part of their subsidy to investors. Miller demonstrates that in equilibrium, to induce investors to hold more bonds, firms may be required to share up to their entire tax subsidy with investors, leaving firms indifferent between issuing debt or equity.

DeAngelo and Masulis (1980) extended Miller's (1977) model obtaining an *interior* solution for the firm's optimal capital structure in the presence of personal income taxes. In deriving their results they assume that (1) corporations either pay a constant tax rate on positive taxable income (no progressiveness in firm's income tax rates) or pay no taxes if taxable income is less than or equal to zero; (2) debt-related tax shields,

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[144] As noted by Scholes and Wolfson (1989) "the premium required by bondholders in equilibrium to cover the tax penalty on interest income they earned on holding corporate bonds" was one material cost of issuing debt that had been neglected. They further suggest that "[t]o induce these individuals to hold bonds rather than tax-favored stock, issuers must pay a higher before-tax rate of interest." Lastly, they argue that Merton Miller made the proof that "the resulting corporate after-tax cost of debt finance could be exactly the same as the risk-adjusted after-tax cost of equity finance."

investment-related tax-shields (such as depreciation) tax credits, are (or may be) used to reduce taxable liability; (4) net operating tax-loss carry-backs and carry-forwards and markets for transferring tax losses are absent; and (5) investment scale is invariant while outstanding debt is allowed to vary.

As pointed out by Modigliani and Miller (1963), Brennan and Schwartz (1978), and others, firms are subject to transient and asymmetrical taxation regimes, and risk losing (at least partially) the value of some tax shields in years of low operating income. Therefore, the expected corporate tax advantage of borrowing is a monotonically declining function of financial leverage. Consequently, in the DeAngelo-Masulis framework, the probability of a firm being deprived of the economic benefits of interest expense tax-deductibility increases (holding before-tax earnings constant) as more debt and non-debt tax shelters become available. Therefore, the theory predicts that firms in these conditions are expected to use relatively less leverage in order to reduce the risk of losing the tax benefits of its interest deductions (DeAngelo and Masulis 1980, hypothesis 3). DeAngelo-Masulis model incorporates uncertainty and recognizes that tax laws at the firm level, besides the tax-deductibility of the costs of debt financing, provide also (1) investment-related tax-shelters, such as, fixed assets depreciation; and (2) input / product markets tax-shelters, such as provisions for bad debts. They argue that the marginal benefit of tax shields will differ across firms, due to differences in cash flow patterns and non-debt tax shields. On the other hand, all firms will incur the same marginal cost when issuing debt. Because all firms determine their capital structures by equating the marginal cost and marginal benefit of debt, each firm will have a different optimal debt level, i.e. the level of debt at which marginal cost equals marginal benefit of debt will vary across firms. Thus, firms will have different capital structures. Further, as non-debt tax shields reduce the marginal tax benefit from debt tax shields, a firm's debt level will be inversely correlated with the magnitude of its other tax shields.

DeAngelo and Masulis (1980) postulates, thus, a positive relationship between non-debt tax shields (arguably, investment-related tax shields) and the likelihood of losing the income-tax benefits associated with the interest expense. Hence, the model yields the testable hypothesis that, cross-sectionally, firms with greater investment-related tax shields

[145] This was the U.S. case in 1977, and may be again some time in the future.

should, *ceteris paribus*,[146] carry lower debt in their capital structures. The DeAngelo-Masulis model therefore predicts that a *substitution effect* might occur resulting in an inverse relation between debt and investment-related tax shields.

The assessment of the effects of income taxes, both at firm and personal levels, on capital structure is a very intricate problem to study due to the severe difficulties as pointed out by several academics.[147] Hamada and Scholes (1985), for example, argue that firm financing transactions reflect the complexity of an (worldwide) economic environment of ceaseless convolution and interaction. Firms and investors, in this setting, are confronted with (1) a growing number of tax provisions and rules; (2) many different (and more integrated) markets for the many different securities; and (3) extended mobility of agents searching for different tax liabilities. Therefore, agents can either supply or demand different financial assets in the various markets searching for after-tax profitable opportunities. Hamada and Scholes argue further that "because of this complexity, what is most important is to consider simultaneously the effects of seemingly many different tax provisions and the equilibrium requirements across many different markets."

Faig and Shum (1999) point to other sources of the difficulties in handling the problem of the tax effects on capital structure. A first difficulty is related with the restrictions to the full tax-deductibility of firms' opportunity cost capital. A second difficulty is associated with the asymmetry of corporate tax systems, "in the sense that taxes are payable immediately if taxable income is positive whereas losses are not refundable at the full corporate tax rate." Lastly, firms may be impelled to an undesired capital structure (for example through the influence of regulatory discipline) which will exert an upward pressure on the firm's opportunity cost of capital, which is not fully tax-deductible.[148]

Another major source of concern in studying the relationship between income taxes and a firm's capital structure problem relates to the likelihood that the firm's pre-tax

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[146] Namely, holding before-tax earnings constant.

[147] Also Faig and Shum (1999) argue that "[...] the US corporate tax, as in most countries, is not a simple tax on economic profits, and a number of issues complicate the assessment of its effects."

[148] A firm's capital-base takes time to build, but once build, Faig and Shum explain, "most costs cannot be recovered, so firms may be 'stuck' with more than they later desire. With uncertainty, such investment irreversibility increases the opportunity cost of capital. And the presence of a corporate tax further exacerbates this effect because the cost of capital inflexibility is not a deductible expense."

income might be lower than its interest expense, what brings the issue of the firm issuing risky, instead of riskless, debt securities. In this circumstance, the firm will suffer (incremental) costs commensurate with the risk of its security issues, and which will partially or entirely offset the income tax benefits associated with debt financing. This is the problem of financial distress and bankruptcy addressed in the following section.

2.10. FINANCIAL DISTRESS AND BANKRUPTCY ARGUMENTS

Not surprisingly, the debate that surrounds the relevance of financial distress[149] and bankruptcy as a determinant of capital structure choice is, indisputably, rooted in the inspired work of Modigliani and Miller (1958, 1963).[150] The existence of debt-favoring biases and the intuition that bankruptcy states are costly provided fertile ground for new hypotheses to sprout. The first theoretical developments in this area were conceptual *departures* from the Modigliani and Miller (1958, 1963) framework,[151] and were achieved through the relaxation of some of its assumptions. They focused, primarily, on the perplexing inconsistency between the capital structure optimality conditions described in M-M (1963) and empirical evidence of the use of financial leverage by real business firms. In short, new hypotheses attempted to solve the capital structure "puzzle". Among those hypotheses are: (1) the interrelation between financial insolvency states and a firm's capital structure policy; (2) the economic and financial implications of reorganization processes following financial distress and bankruptcy; and (3) the reciprocal influence of strategic behavior on product/input markets, dividend policy and corporate governance structures.[152] Each represents a different branch of inquiry. In an effort to control the scope of this study, no attempt is made here to survey all three branches of the literature.

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[149] John (1993, 61) provides a "*natural* definition of financial distress" (author's emphasis): "A firm is in financial distress at a given point in time when the liquid assets of the firm are not sufficient to meet the current requirements of its hard contracts." The author conceptualizes *hard contracts* as the contracts that upon firm's violation "the claimholders have specified and unspecified legal recourse to enforce the contract." By opposition, soft contracts are the ones missing that enforcement mechanism.

[150] Under Modigliani and Miller theorem, bankruptcy is a plausible but costless event, therefore, specifying the existence of bankruptcy costs violates the theorem's set of assumptions. Although yielding remarkably insightful contributions, their model ignores costs arising with incremental debt financing, which increase the financial risk of the firm.

[151] As shown in Myers and Robichek (1966) this conclusion still holds even dropping the assumption of absence of bankruptcy risk, but provided bankruptcy is costless.

[152] For a comprehensive and insightful account of theoretical and empirical literatures on financial distress and bankruptcy effects on capital structure see Senbet and Seward (1995).

There are no clear-cut boundaries between these three branches. Plainly, there are conspicuous *spillovers* between them, such as agency problems between stockholders and bondholders related to debt financing.

Alternatively, the first topic — the relationship between bankruptcy and corporate capital structure policy — is structured around two major setups. The first discusses the static trade-off model developed, either by the relaxation of some of its underpinning assumptions or by hypothesizing relationships with other considerations, such as managerial and owner incentives for risk taking and investment strategy. The second line of inquiry examines challenges to the both sides of the trade-off model's cost/benefit equation.[153]

Static Trade-off Models of Firm Capital Structure

Bankruptcy is a complex interaction of a multitude of financial and real factors. It is widely believed that the probability of bankruptcy is an increasing and positive function of financial leverage. Another potentially significant factor in helping to explain bankruptcy problems is related to the level of economic performance of the firm which is affect, among other, by technological reasons, product/input market considerations, or macroeconomic adverse effects (e.g., Kale and Noe 1987; Green and Talmor 1985; and Castanias 1983).[154, 155] A economically non-performing firm, *ceteris paribus*, is unlikely to fulfill all its contractual financial obligations *vis à vis* its creditors; it will become financially distressed and, eventually, bankrupted and even liquidated.[156] Firms in this distressed situation can expect to incur nontrivial losses of economic efficiency (bankruptcy costs).[157,158] Formal bankruptcy proceedings — *reorganization* and *liquidation*[159] — are the arrangements used to overcome this problem.[160]

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[153] This inescapable *option* restrained the examination of some non-trivial issues, such as details of the dichotomy between financial distress and economic distress and between bankruptcy and liquidation. Or the resolution of bankruptcy, either through a court-based process, or privately handled. This is the price to pay in avoiding a pervasive tendency for dispersion.

[154] Others suggested factors might be, among others, dishonest behavior, natural catastrophes.

[155] Competing theories attempt to explain firm's performance. Dominant paradigms in this area are, typically, the Mason-Bain's *Structure-Conduct-Performance* paradigm, and the Michael Porter's *Five Forces Competitive Model*.

[156] This problem results from an increased exposure to "business failure, insolvency, default on creditor claims and filing for bankruptcy" (Altman 1998).

[157] Throughout this work I adopt the conventional procedure to use interchangeably the terms *financial distress costs, insolvency costs,* and *bankruptcy costs*.

[158] Expected bankruptcy costs may be defined "as a product of the probability of bankruptcy and the [value of] direct and indirect costs of bankruptcy" (Damodaran 1998, 229), where

A key point for analyzing financial distress and bankruptcy is the acknowledgment that (1) financial contracts are inherently incomplete (Aghion and Bolton 1992), and (2) by implication, only in a incomplete contract framework is there a role for bankruptcy arrangements. If all debt-financing transactions could be made through the writing of complete (and costless) contracts, then every such instrument would stipulate, *ex-ante*, "what should happen if a firm could not meet its debt obligations" (Hart 1995). In such a case, bankruptcy and liquidation proceedings would be totally useless, and it is hard to see what role would be left for bankruptcy courts.

It is trivial that the probability of servicing contractual obligations of debt financing is an inverse function of financial leverage. But because cash flow streams are assumed invariant (at least in the short-term), then leveraging up the firm commits a larger part of cash flow to debt claimholders. Many firms are not able to fulfill these contractual commitments, triggering default. In such circumstances, shareholders may see their ownership rights severely constrained, either through a dilution (or even a transfer to creditors) of their residual control rights, or a reduction on their residual claims.

Static tradeoff capital structure theory aims to equate the advantages and disadvantages of financial leverage.[161] It suggests, as shown by Scott (1976), that the probability of bankruptcy associated with leveraging the firm leads to an optimal capital

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"the probability of bankruptcy is the likelihood that a firm's cash flows will be insufficient to meet its promised debt obligations" (Ibid.). Masulis (1988, 31) rationalizes the probability of bankruptcy as "a positive function of firm leverage."

[159] Bankruptcy and liquidation are sometimes related to each other in the literature. However, as pointed out in Haugen and Senbet (1978) they are separate and independent events. Liquidation, they argue, is a capital budgeting decision.

[160] Nonetheless the objectives of, both, the liquidation process and the reorganization process be consensual and shared among many countries, the actual legal framework "differs markedly from country to country" (Altman 1998). Under the U.S. Federal Bankruptcy Code, liquidation is regulated in chapter 7, and reorganization in chapter 11. In Portugal, liquidation and reorganization are regulated under the Decree of Law 132/92 from 23 of April 1992. Nonetheless the indisputable relevance of formal bankruptcy proceedings we do not describe in this work the details of the respective procedures. For a comparative analysis of US, UK, and German Insolvency Codes see Franks, Nyborg, and Torous (1996).

[161] The first use of this designation is, consensually, attributed to Myers (1984).

structure at the firm level.[162] Thus, the *downside* of using debt financing in the capital structure must be balanced with its alleged income tax benefits at the firm level.[163]

Trade-off models of capital structure confront both the expected value of bankruptcy costs and the expected value of tax benefits (e.g., Robichek and Myers 1966, and Baxter 1967). In this perspective, a firm should be adding debt to its capital structure until the present value of increased expected distress costs outweighs the expected value of the tax advantage of using additional debt. The theory predicts that an optimal capital structure exists at the point where these costs and benefits are in equilibrium, formally:

$$V = V_U + PV\ \tau_C - PV\ K_B,$$

where V stands for market value of the firm, V_U for the value of the unlevered firm, τ_C for the value of the debt tax shield, K_B for the value of the bankruptcy costs, and PV for value present value.

In this context, value-maximizing firms obtain an optimal capital structure at the point where the present value of the tax advantage of using additional debt financing equals the present value of the bankruptcy costs (among others Robichek and Myers 1966, and Baxter 1967).[164]This view implies that when bankruptcy is costly there should exist an optimal debt ratio, beyond which the tax advantage of additional debt is outweighed by the present value of increased bankruptcy costs.[165]

The presence of one or more of the various intrinsic features of these models, such as a one-period horizon, the presumption of risk-neutral economic agents, and the absence of optimal capital structure adjustment costs, diminish their ability to realistically portray some characteristics of real world firms.[166]

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[162] The complexity of the model did not permitted to produced closed-form solutions for the optimal debt policy. Therefore the author presents numerical solutions showing the trade-off between the tax advantages of debt and the increased bankruptcy costs associated with higher leverage. Firms will employ debt up to the point where the marginal tax advantage of debt is equal to the marginal costs of bankruptcy.

[163] A number of authors (e.g., Baxter 1967, Hirshleifer 1970, 264) have noted that bankruptcy costs might provide an economic rationale for the existence of finite optimal capital structure, and therefore contributing for a reconciliation between the M-M theorem and the real-world firms' observed financing behavior.

[164] Other authors that followed this conceptual framework to introduce formal bankruptcy considerations in capital structure models were Kraus and Litzenberger 1973, Scott (1976), and Kim 1978, Lee and Barker (1977), and Chen (1978, 1979).

[165] As previously shown, in a economy where M-M (1963) results obtain, financing decisions are not a matter of indifference to the equityholders. As long as firm's debt securities are fairly priced, the entire value of the additional tax shield generated when the firm, at the margin, increases its financial leverage accrues, unambiguously, to the equityholders.

[166] In the absence of adjustment costs and under the static tradeoff framework, firms' actual leverage ratios are optimal. Therefore, as appropriately pointed out by Myers (1984, 577) "there should be some

Their common argument was that the *actual* intensity of debt financing in firm capital structures was lower than predicted by theory, because of the expected costs associated with potential financial distress and bankruptcy. The theory prescribes that firms leverage their capital structures up to the point where the marginal tax benefits of debt financing equals the marginal bankruptcy costs. Therefore, an optimal, finite debt-equity ratio should exist as the result of trading-off the present value of the expected bankruptcy costs and the present value of the tax savings associated with the deductibility of interest payments.

One weakness of this theory relates to the qualitative nature of the arguments used to explain how the tax advantages of debt financing were offset by increased cost of financial distress. Baxter (1967) provides an early example of the use of this argument in suggesting the existence of an optimal interior capital structure.

Bankruptcy Costs

Earlier trade-off models provided an optimal interior solution for the capital structure problem in the presence of material bankruptcy costs. However, these models did not satisfactorily explain the presence of such costs. Thus, one might conjecture that such costs are either a consequence of some (unspecified) form of market imperfection or that there is no economic rationale for its exogenous determinations (Baxter 1967, Robichek and Myers 1966).[167] According to Lemma Senbet (New Palgrave Dictionary of Money and Finance, 173) we lack "economic justification for the existence and the relevance of significant bankruptcy costs in the determination of the firm's optimal capital structure."[168]

Typically, the explanation offered in the literature for real-world firms having equity in their capital structures is rooted on the nontriviality of costs of financial distress and bankruptcy.[169] The magnitude *of expected bankruptcy costs*, however, as pointed out by

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cross-sectional dispersion of actual debt ratios across a sample of firms having the same target ratio" as firms are unable to countervail the random chocks that make them diverge from their optimal leverage. Bankruptcy cost models proposed by Chen (1978, 1979) and Lee and Barker (1977) incorporate the *desirable* elements of multi-period horizon and risk-aversion.

[167] It has been shown in the literature (see, e.g., Higgins and Schall 1975, and Van Horne 1977) that bankruptcy costs are non-existent in perfect and frictionless economic environments.

[168] For Williamson (1988) "the early bankruptcy argument was […] a rather narrow, technical construction."

[169] Diamond (1994) argues that bankruptcy costs "can sometimes be negative (so bankruptcy becomes a net benefit), when bankruptcy allows claim holders to prevent a borrower from undertaking an unprofitable investment."

Senbet and Seward (1995) depends, among other factors, on the efficiency of resolution of financial distress.[170, 171]

An important question to raise concerning expected bankruptcy costs is related to its empirical measurement. The concept of bankruptcy costs is firmly predicated on the elusive nature of an economic opportunity cost and on the unobservable suboptimality of managerial decision-making. Both are hard to grasp and difficult to measure empirically. Bankruptcy costs are typically categorized in the literature as either direct or indirect. The former represent explicit (out-of-pocket) expenses incurred in bankruptcy procedures (reorganization/liquidation process), such as filing, lawyers and accounting/auditing fees, and managerial costs of administering the bankruptcy. The latter, which are hard to estimate are mainly opportunity costs related to losses of market power in contractual arrangements with customers, suppliers and employees, as well as business and profits, associated with the firm's financial insolvency.[172] Other sources of indirect bankruptcy costs relate to lost sales, profits, valuable investment opportunities, and tax shields, as well as having managerial efforts distracted from value-enhancing strategic management to survivorship management.

Theoretical Issues Related to Financial Distress and Bankruptcy Costs

As discussed earlier, the financial distress and bankruptcy problem carries the burden of the expected costs that are likely to arise, *ceteris paribus*, as a result of excessive financial leverage. In these instances bankruptcy costs might become substantial in relation to the value of the firm.[173] A highly leveraged firm is very likely to end up unable, at least partially, to honor its contractual payments to debtholders. In such instances, it must either renegotiate its obligations to creditors or declare bankruptcy. Bankruptcy can be voluntary or involuntary. In either case, once bankruptcy is declared, the future of a firm it is in the hands of the bankruptcy court, which will consider the trade-off between the value of the firm as a going concern and its value in liquidation.

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[170] This implies that models for empirical testing on this issue should be specified aiming at uncovering statistically significant causal relationships between bankruptcy costs and financial leverage.

[171] Grinblatt and Titman (1998, 494) argue that "[w]hen a firm goes bankrupt, control of the firm's assets move costlessly from the equity holders to the debt holders." However, it is our belief that this argument has to be, strictly, understood within the boundaries of the equityholders / bondholders relationship.

[172] Typically these costs are a direct consequence of reluctance of, for example, customers, suppliers, and employees to transact with a financially distressed firm unless they are opportunities for improving their own utility at the expense of the firm.

Several authors developed theoretical models to examine the implications of bankruptcy problems of capital structure. Brennan and Schwartz (1978), for example, used numerical methods to provide an examination of optimal capital structure using an option-pricing model[174] where the value of the assets follows a diffusion process with constant volatility.[175] They show that, at low levels of financial leverage, firm value is an increasing function of financial leverage, as the firm's income tax savings overweigh any bankruptcy costs. There is, however, a critical threshold (although not unambiguously defined by the authors) beyond which an increase in leverage reduces firm value. The authors suggest that raising the probability of bankruptcy increases the incertitude about tax savings materializing. They further argue that this is sufficient to lead to optimal capital structure even when bankruptcy costs are absent.[176] In the Brennan and Schwartz model, tax savings and the probability of bankruptcy both rise with increasing leverage, and, conjointly increase the likelihood that those tax savings will be lost. In these instances, the value of a firm will be an increasing/decreasing function of the prevailing outcome. This model rests on the underlying presumption that low leveraged firms can leverage up without substantial increase in the likelihood of becoming insolvent.[177] Thus, a firm will experience a positive net effect from increasing its leverage since its tax benefits overweigh any bankruptcy costs (first outcome prevails). For highly leveraged firms, in contrast, taking in additional debt will increase (an already large) probability of bankruptcy. In those instances, a firm increasing its leverage will see its probability of bankruptcy increase and will suffer the inherent loss in value (second outcome prevails). Because the Brennan and Schwartz results, as previously noted, are not in a closed form but rather are numerical solutions, their comparative statics may not have general validity.

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[173] However, how substantial still remains an empirical question.

[174] Brennan and Schwartz relax the assumption that debt-related tax shields constitute a "sure stream". Their rationale relates to the fact that a bankrupted firm cans no longer profit from the income tax benefits associated with the costs of debt financing. The authors incorporate in their model the uncertainty of debt tax shields due to the possibility that, in some future date, a firm may not have taxable income to offset with the interest payments on debt. As previously noted Modigliani and Miller in their 1963 paper made a remark on this issue but without any other analytical consequences.

[175] Brennan and Schwartz modeled the value of a levered firm, V_L as a function of: $V_L = f(V_U, D, r, t)$, where V_U = value of unlevered firm as a random variable following a Brownian motion (a Gauss-Wiener process); D = face value of the debt outstanding; r = coupon rate; and t = time to maturity.

[176] In their numerical solutions the authors assumed the value of expected bankruptcy costs (as a fraction of the firm value at bankruptcy) as zero.

[177] Miller (1990) points out that "aggregate risk might be unaffected by modest changes of leverage some might willingly concede, but not when leverage is pushed to the point that bankruptcy becomes a real probability."

Leland (1994) derived closed form solutions for the value of the long-term risky debt and yield spreads when the asset value of the firm follows the same diffusion process. He determined the optimal capital structure in the model in which shareholders endogenously decide when to declare bankruptcy. In addition, Leland determined the optimal capital structure when a positive net worth covenant triggers bankruptcy.[178] His results extend the work of Merton (1974) and Black and Cox (1976) in terms of the valuation of risky debt by the inclusion of taxes and bankruptcy cost variables.

DeAngelo-Masulis' (1980) model provides results that are consistent with the notion that debt-related net tax savings and bankruptcy costs associated to financial leverage are, typically, a relevant factor in firm's financing decisions. Not surprisingly, in their model the expected debt tax-shield equals the expected marginal cost of insolvency. One of the predictions of the model is, *ceteris paribus*, that firms with lower insolvency costs are expected to evidence higher financial leverage.[179]

Grossman and Hart (1982) provide a normative agency theoretic approach to modeling firm financial leverage as a mechanism to constrain managerial discretion and curtail agents' propensity to behave opportunistically.[180] Given that increased financial leverage in a widely held corporation (1) exacerbates the likelihood of bankruptcy and (2) produces harmful consequences on managers' wealth, Grossman and Hart's model predicts that the threat of bankruptcy provides the appropriate incentives for managers to adopt a firm's value-maximizing behavior. In this framework a firm's leverage becomes a management quality certification implement.

Titman (1984) analyzes the impact of the firm's capital structure choices upon the decisions to liquidate. He argues that, *ex post*, liquidation may be beneficial for creditors and shareholders in the sense that it may allow disentangling from both explicit and implicit commitments with customers, suppliers, and employees.

Titman and Shapiro (1985) argue that bankruptcy costs provide an incentive for a value-maximizing firm to attempt to adopt low risk investment and financial policies, particularly if its core business concerns *unique* and *specialized* products / services. With

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[178] As in Brennan and Schwartz (1978).

[179] For example, firms with lower operating income volatility, a small number of creditors, and partial overlapping between creditors and shareholders.

[180] The following section addresses the problem of conflicts of interests related to the firm's capital structure decisions arising in a principal-agent relationship environment.

this pattern of behavior, firms avoid incurring excessive contracting costs with customers, suppliers and creditors.[181]

Webb (1987) shows, in a framework with rational agents and with perfect and complete information about the economic superiority of informal settlement over formal bankruptcy proceedings, that the informal settlement is a Pareto-efficient solution for the bankruptcy problem.[182]

The Question of the Magnitude of Bankruptcy Costs

For bankruptcy costs to be helpful in explaining the capital structure problem, they must be significant. Several authors claim that available empirical evidence provides support for the hypothesis that bankruptcy costs are a relevant consideration for capital structure decisions (e.g., Altman, 1998). In contrast, other authors like Warner (1977), Miller 1977, and Haugen and Senbet (1978)[183] argue that the empirical estimates of bankruptcy costs seem insufficiently significant to be a factor in the capital structure equation. According to Senbet and Seward (1995) "direct bankruptcy costs are unlikely to be significant determinants of the firm's capital structure when debt was originally issued." The authors also observe that the "evidence on the indirect costs of bankruptcy is inconclusive."[184] In contrast, Litzenberger and Sosin (1979) suggest that although direct bankruptcy costs are found to be very low, indirect costs in the form of operating inefficiencies due to reduced maintenance costs and/or loss of sales tend to be significant. Haugen and Senbet (1978) also support the notion that the indirect costs associated with the transfer of ownership (i.e. disruptions in the firm's relationship with its suppliers and / or customers) are insignificant. This stems from the assumption that customers are rational and their decisions are based on their perceptions about the viability rather than the ownership of the firm. Finally, they suggest that the costs that are attributed by others (Kraus and Litzenberger (1974), Scott (1976)) to bankruptcy should be attributed to

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[181] These contracting costs may be regarded as a special type of agency costs.
[182] See Webb (1987) for a formal demonstration of the implications of complete and incomplete information cases in explaining firm's bankruptcy.
[183] The authors argue that under perfectly competitive capital markets where participants are rational price takers, bankruptcy costs can be minimized by informal reorganization (also popularized as private workouts). Alternative arrangements could the purchase, at market prices, of the outstanding debt by the shareholders, or the purchase of the equity by creditors, or outsiders purchasing the firm all together.
[184] For an account of some empirical evidence on financial distress and bankruptcy see the table appended to this chapter of the dissertation.

liquidation. They argue that liquidation is a capital budgeting question and therefore it should be considered independently of the bankruptcy problem.[185]

Despite an intense research effort on this topic, the empirical evidence gathered so far cannot establish unambiguously the magnitude of the deadweight direct costs of bankruptcy. However, the significance of the costs resulting from the formal proceedings, including formal reorganizations, should not imply that they are relevant to the theory of optimal capital structure. If impediments to the privatization of the bankruptcy process did not exist, then a private workout or another informal reorganization mechanism achieved through the financial market could mitigate those costs.[186] As the literature suggests, the free rider problem is a potential obstacle to pure market solutions or private workouts of financial distress and bankruptcy.

In summary, all the theoretical progress accounted for in developing the trade-off theory of capital structure does not yet provide a satisfactory elucidation about firms' strategic financing behavior in practice (e.g., Allen and Morris 1998).

If an the examination of the firm's capital structure policy under a static trade-off framework does not provide us with satisfactory answers, one should look elsewhere to ascertain the relevance of financial distress and bankruptcy arguments for capital structure decisions. One potentially promising route seems to be the search for linking bankruptcy with other considerations, such as agency relationships, strategic behavior in input/product markets, corporate control contests, and corporate governance transactions. Blair (1995, 23-24), for example, analyzes the interrelation between financial distress and bankruptcy and corporate governance, concluding that it is of utmost relevance for capital structure policy. As a matter of fact, bankruptcy law makes a major contribution to illuminating the problem of the firm's management and control under financial distress states. It also helps to bring some clarity to the difficult question of priority in claims. This aspect is of utmost relevance since the rights and power of disparate claimants affect their bargaining position *vis-à-vis* the firm. Another example is Grossman and Hart's (1982) bankruptcy model. In

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[185] Bankruptcy and liquidation are independent economic phenomena. The former concerns the transference of ownership from stockholders to bondholders, the latter configure dismantling the firm's assets and its sale piecemeal. The rationale for the liquidation decision is the net present value rule of capital budgeting irrespective of the financial state of the firm (bankrupt or non-bankrupt). Liquidation results from a context of financial distress, provided that the going concern value of the firm is lower than the liquidation value.

[186] See Haugen and Senbet (1978, 1988), Jensen (1989) and Giammarino (1989) for discussions in informal reorganizations and privatization of bankruptcy.

state of insolvency states stakeholders should be concerned about the value of the firm as a *going concern*. Well-diversified, atomistic equityholders will, however, have no incentive to invest in monitoring managers' actions, as they attempt to keep the firm running. These equityholders have a negligible *upside* potential although an almost nonexistent *downside*; even assuming managers pursue increasingly risky policies. Creditors, on the other hand, will liquidate the firm if continuing operations represents a serious threat to the value of their claims. Therefore, both shareholders and creditors lack incentives compatible with the firm's ability to survive and improve its long-term value. Managers, in contrast, because of the low diversification of their human capital investment — likely suffering a "hold-up" problem inherent to the specificity of that investment — will be better off in attempting to improve the going concern value of the firm.[187]

As argued by Cornelli and Felli (1997), bankruptcy legal procedures attempt to maximize efficiency both *ex-ante* — concerning "the choice of what to do with the firm" — and *ex-post* — regarding the effects on incentives of the parties involved. Concerning the latter they see bankruptcy procedures as (1) providing the managers / owners of the bankrupted firm "with the right incentives to manage the firm so as to avoid ending up in financial distress;"[188] (2) performing a protective role for "creditors' interests" and therefore contributing to lowering the overall costs of the firm's debt financing.[189]

In a different direction, Opler and Titman (1996) argue that "the most important costs associated with financial distress arise because of changes in the way that stakeholders view a firm as it moves towards financial distress."[190] Non-financial stakeholders — e.g. workers,

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[187] Amihud and Lev (1981) formalize the argument that the higher is managerial firm ownership, the more likely is for managers to pursue diversification strategies (at the firm level) because of their increased need for personal risk reduction.

[188] For example by providing them with the appropriate disincentives for undertaking risky strategies. For an account of the effects of bankruptcy incentives see, among others, Aghion and Bolton (1992), Bolton and Scharfstein (1996).

[189] According to the authors, the protection of creditors' claims include, both, the attempt to maximize the proceeds to the creditors from the reorganization (*revenue efficiency rule*) and the respect of the relative seniority of creditors' claims (*absolute priority rule*).

[190] Opler and Titman (1996, 2): "in most cases major capital structure changes do affect how firms […] are perceived by their customers, suppliers, employees, and competitors. This is particularly true when the amount of debt leads these important stakeholders of the firm to question the firm's future financial viability."

suppliers and customers — are likely incur in *spillover* costs imposed upon by a firm in liquidation. The authors argue that financial distress resulting from increased leverage, affect competition — e.g., for market share — insofar as it may be rationalized as a capital budgeting problem. We could expect that highly leveraged firm, ceteris paribus, to underinvest as its debt tends to increase the discount rate the firms uses in making its capital budgeting decisions. Thus, a firm in this setup is likely to show a lower propensity to invest than it would if it were less levered. Hence, the discount rate will lower the firm's incentive to undertake investments to increase its market share. They further hypothesize that there is an interaction between the dynamics of competitive behavior of the firm and the financial distress costs imposed upon non-financial stakeholders. They expect these considerations to be especially important for those firms with products that need future servicing, or for which the quality of their products is both very important and difficult to observe. Financial distress costs can also be high for firms that require their employees and suppliers to invest in product-specific training and physical capital. Differently, firms that produce non-durable goods or provide services that are not particularly specialized are expected to have very low financial distress costs.

Titman and Wessels (1988) report empirical evidence consistent with the view that the more leveraged firms do in fact lose market share compared to their more conservatively financed competitors in industry downturns.[191] Despite, the impressive amount of work done on financial distress and bankruptcy considerations so far, we are still far from having a comprehensive, broadly explanatory and consensual theory on this matter. The sources of criticism of existing hypotheses are several. For example, Miller (1977) argues that costs associated with bankruptcy are not large enough to counterweight the tax benefits associated with debt-financing. Suvas (1997, 14) points out "the realism of several of these [bankruptcy] models is reduced by assuming a one-period horizon, risk-neutrality, or both." Other authors are concerned with the static features of most bankruptcy models, which are not able to capture the dynamics of financial distress and bankruptcy processes (e.g., Fisher, Heinkel, and Zechner 1989).

[191] Similarly, highly leveraged firms will be pinched during business cyclical downturns and are unlike to be able to respond when competitors launch strategic offensive moves to grab market share.

2.11. AGENCY THEORY CONSIDERATIONS AND CORPORATE CAPITAL STRUCTURE CHOICE

As earlier suggested, Modigliani and Miller's (1958) theoretical propositions on capital structure are deeply anchored in the *neoclassical* paradigm. In this theoretic perspective, the firm is viewed as a *production function* (or a *black-box*) without any consideration of any of the behavioral features that characterize actual firms. Thus, inherent to its *positioning*, the M-M model reflects the same weaknesses[192] that are ascribed to the paradigm where its roots are embedded. Consequently, it is lacking the behavioral features that would enable it to describe satisfactorily the role managers play in the decision-making process of actual firms. One non-trivial problem associated with the neoclassical model of the competitive firm is related to the assumption that the owners have an effective part in controlling the use of firms' assets.[193] The implication of this is that the management team has no productive role in the neoclassical theory.[194]

2.11.1. Shifting from the Neoclassical Paradigm

The 'Separation of Ownership and Control' Paradigm

Undertaking contemporary types of projects and productive activity demand increased pooling of, among others, financial resources (capital). To deal with this requirement firms organize under larger and more complex legal designs of business organization than sole proprietorships and partnerships. And since the allocation of funds implied by the increased scale of projects and activities is, typically, out of reach for those more primitive forms of business organization, the modern corporation emerges as a much more open vehicle for pooling capital, and with less restricted residual claims.[195] This notion is consistent with Hansmann's (1996) contention that the "large-scale enterprise will be organized in the form of investor-owned firms."

This notion is also corroborated by Easterbrook and Fischel (1991) who claims that "[p]ublicly held corporations dominate other organizational forms when the technology of production requires firms to combine both the specialized skills of multiple agents and large amounts of capital."

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[192] See chapter II section 2 for an account.
[193] Henceforth we use owners/managers as insiders. Investors and outsiders are also assumed as synonyms.
[194] The neoclassical firm reflects the imperatives of the price system, not those of its management. Consequently, if the price system works well, resources are efficiently allocated.
[195] As point out by Fama and Jensen (1983), "the residual claims of different organizational forms contain different restrictions."

Underlying this rationalization of the modern corporation, nowadays widely supported in the literature of the theory of the firm, are distinctive contractual features, such as, the limited liability provision, and the specialization in ownership and management (Eggertsson 1990).

The observation (and acknowledgement) that large firms are not owned and operated by individual entrepreneurs is a viewpoint that was firstly identified by Adam Smith (1776) (see, e.g., La Porta, Lopez-de-Silanes and Shleifer 1999, Baskin and Miranti 1997, and Fama and Jensen 1983).[196, 197] Thus, Adam Smith recognized that the separation of the power committed to professional managers over the firm's decision-making process, and the controlling power assigned to residual claimants, is a source of economic inefficiency due to the potential misalignment between their objective functions. This conflict of interest is at the genesis of the so-called *agency problem*.

The Nexus-of-Contracts Theory of the Firm

In 1932, Adolph Berle and Gardiner Means[198] hypothesized that in large corporations the *ownership*[199] is separated from *control*,[200] giving a formal expression to that important dichotomy, which is, indisputably, a central hypothesis in the theory of corporate finance.[201] This remarkable contribution became the structural underpinning of

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[196] Auerbach (1992, 475) acknowledges that neoclassical economics "does not distinguish managers form owners since, at the time of its foundations were laid in the 1870's, the dominant form of corporation ownership was still the single proprietorship." This argument does not seem consistent with the observation that Adam Smith, nearly one century earlier, brought forward the intuition for the problem.

[197] Ricketts (1994, 218) claims that in his view, and according to Adam Smith, managers "look with less 'anxious vigilance' over the shareholders' wealth than they would do over their own. Only if granted a monopoly or 'exclusive privilege', argued Smith, could the joint stock form of enterprise hope to prevail over the 'private adventurer'" (*The Wealth of the Nations*, Edwin Cannan, ed. Methuen, London, 4th ed. vol. 2, 233).

[198] "The split between ownership and control in the widely held corporation is often virtually complete, with ownership vested in a large and diverse population of stockholders and control wielded by a small group of professional managers. For this kind of corporation, it is no longer realistic to regard management as the hired hand of the owner" (Berle and Means 1932).

[199] The "[t]heory of ownership addresses the question of how […] residual control rights are allocated efficiently" (Shleifer and Vishny 1997).

[200] Berle and Means used control as meaning to perform the functions and exercise authority over the management of a firm. See Williamson (1964) for a discussion of the separation of ownership and control in the corporation

[201] According to (Bolton and Scharfstein 1998) "[u]nderstanding the agency costs stemming from the 'divorce of ownership from control' is now the central issue in corporate finance, and has been for some time". Allen and Winston (1995) are also very assertive when claiming that "the nexus of contract model is the dominant paradigm in modern corporate finance."

what would develop as the *agency theory*, and indirectly, as an essential requirement for the understanding of corporate governance problems.[202]

The Berle and Means hypothesis, postulating the separation of a firm's ownership from its control, suggests that the firm has thereby to be viewed as a complex *nexus of contracts* among claimholders, making the firm a kind of a *legal fiction*.[203] Jensen and Smith (1985) support this notion, arguing that it helps to understand that organizations do not have rational behavior, in the sense that they do not have preferences, make choices, like individuals. Otherwise, "[t]he behavior of an organization is the equilibrium behavior of a complex contractual system made up of maximizing agents with diverse and conflicting objectives."

According to Fama and Jensen (1983) the rationale for the phenomenon of separation between ownership and control should be looked for in "the unrestricted nature of the residual claims of open corporations" which, typically, determine an "almost complete separation and specialization of decision functions and residual risk bearing."

Fama and Jensen (1983 a, b) argue that the separation of decision-making functions from residual risk-bearing — the ubiquitous problem of the separation of ownership and control — is a recurrent pattern observed across (large) organizations, whatever legal format they choose to structure their organization, and despite an unequivocal predominance of *open* corporations. Additionally, they suggest that the explanation for the persistence and the magnitude of this phenomenon may found in "the benefits of specialization of management and risk bearing" and to "an effective

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[202] In their analysis, Berle and Means, also provided empirical evidence showing that a substantial amount of assets of firms in their sample were under the control of management teams with scarce ownership holdings in these firms. However, recently this theory started to be empirically challenged (e.g., Demsetz 1983, Demsetz and Lehn 1985, Morck, Shleifer, and Vishny 1988, Holderness, Kroszner, and Sheehan 1999, and La Porta, Lopez-de-Silanes, and Shleifer, 1999). These latter authors present evidence on ownership structure of large corporations in 27 wealthy economies. Their findings do not support Berle and Means (1932)'s separation of ownership and control hypothesis, and they argue that the "principal agency problem in large corporations around the world is that of restricting expropriation of minority shareholders by the controlling shareholders."

[203] A stakeholder is a vested claimant, of any sort, on the firm. John and Senbet (1998, 372) categorize as stakeholders of a corporation equityholders, creditors, other financiers, employees, consumers, suppliers, and the government. See Chapter 2 section 3 for a discussion of the nexus-of-contracts view of the firm.

common approach to controlling the agency problems caused by the separation of decision and risk-bearing functions."[204]

2.11.2. Agency Theory in a Corporate Finance Environment

The agency theory addresses the problem of contractual relationship in which one party — the principal — delegates work to another party — the agent — who is empowered with *some* decision-making power in order to perform that work (see Smith 1989; Jensen and Meckling 1976; and Ross 1973). Hence, agency theory attempts to explain this agency relationship using the metaphor of a contract (Eisenhardt 1989).[205] Not surprisingly, one of the agency theory's primary concerns relates to the design of the efficient contractual arrangements. Underlying this contractual mechanism is a complex set of assumptions associated with behavioral, organizational and informational considerations. Concerning the former, agency theory works out of individual's self-interestedly behavior, bounded rationality,[206] and risk aversion. Conflicts of interest among participants, efficiency as the effectiveness criterion, and differential information endowments between principal and agent, are the organizational assumptions. Finally, information is assumed to be a purchasable commodity.

When firms' characteristics are unobservable, outside investors may be at a disadvantage because insiders (owners/managers) have the incentive to behave opportunistically.[207] As suggested by Bolton and Scharfstein (1998, 100) "[t]he diffuse equity ownership structure implied in Berle and Means' argument gives managers effective control of the firm, raising concerns about the possibility of managers to run the firm to their own benefit, possibly at the expense of investors." Therefore, residual claimants (principals) need to exercise their ownership control rights and monitor agents' decision-making. In this framework, principals bear the major part of the risk, trading it off for the economic surplus generated in the firm's productive undertakings

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[204] The same authors further hypothesize that "contract structures of all of these organizations separate the ratification and monitoring of decisions from initiation and implementation of the decisions."

[205] See, e.g., Eisenhardt (1989) for a most thoughtful and insightful discussion of the agency theory.

[206] Implies that individuals are utility maximizers, but do not have the computational ability to estimate, rationally and unbiasedly, all the expected effects of an agency relationship on the future value of his/her wealth. They are not *fully rational* in Simon's (1997) sense. At best, and given a set of alternatives, and a utility function, they are able to compute the alternative that maximizes utility or, in the case of uncertainty, the subjective expected utility (Simon 1997).

(Fama and Jensen 1983a). Because decision-agents do not bear a substantial share of the potential adverse wealth effects of their decisions, principals' wealth may be at risk in adverse states of the world. Therefore they *naturally* engage in hedging strategies, attempting to diversify away their risk. As an individual principal gets his/her portfolio adequately diversified he loses the incentive to exercise his (costly) ownership control rights (e.g., Fama 1980).

Agency theory developed in the literature along two different, though related, theoretical paths: the *normative* (*principal-agent*) and the *positive*.[208]

The *positive approach* has been mostly concerned with describing the governance mechanisms[209] that are hypothesized to alleviate agency problems, emphasizing the associated contracting costs.[210] Among the most influential contributors to the positive agency theory are Jensen and Meckling (1976).[211] Other important contributors to this strand of agency literature are, e.g., Fama and Miller 1972, Jensen 1983, Barnea, Haugen and Senbet 1985, Jensen and Smith 1985, Jensen (1986), and Stulz 1991.

The *principal-agent theory* is based in models whose foundations are the hypotheses concerning structure preferences, information structures and the nature of uncertainty. Like any other formal theory, it involves the careful specification of assumptions, logical deduction and mathematical proof. The theory attempts to explain which of the available contracting alternatives is more efficient in shaping agency relationships under (random) uncertainty, risk aversion, and information asymmetry.[212]

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[207] Eggertsson (1990) defines opportunistic behavior as a "breach of contract involving strategic manipulation of information."

[208] Williamson (1988) and Barnea, Haugen and Senbet (1985) make a similar point. For them the agency theory also has to branches: the economic agency theory and the financial agency theory. The first one corresponds to the Jensen (1985)'s normative branch and the second the positive.

[209] Eisenhardt (1989) formalize two propositions that capture the essence of the governance mechanisms identified with the positive agency theory. Proposition 1: "When the contract between principal and agent is outcome based, the agent is more likely to behave in the interests of the principal." Proposition 2: "When the principal has information to verify agent behavior, the agent is more likely to behave in the interests of the principal."

[210] See, e.g., Charreaux (1987) for a review of the literature on the positive theory of agency.

[211] Methodologically, the positive agency theory builds on an inferential hypothetical-deductive model and on behavioral and optimal incentive contracting. Its arguments are deeply interwoven with the property rights view of economics (e.g. Jensen and Meckling 1976) and are complementary to transaction costs economics (e.g., Williamson 1988).

[212] The argument behind the presumption that *agents* are more risk averse than *principals* results from the former being underdiversified human-capital investors, and the idiosyncratic nature of its associated risk. As pointed out, among others, by Friend and Hasbrouk (1988, 2) "management's stake in the firm, reflecting both holdings of marketable securities and firm-specific human

Major fields of inquiry include optimal risk sharing problems, incentives in contracting, characteristics of optimal contracts and properties of equilibrium solutions in a general equilibrium framework (welfare analysis) (see, e.g., Ross 1973, Harris and Raviv 1979, and Grossman and Hart 1983, Sappington 1991, and Rajan 1992).

Agency Relationships

A very simple setup will help to frame the problem of an agency relationship. An entrepreneur (or a manager) is endowed with an investment opportunity but lacking the resources required to undertake the project, needs to raise these funds from investors.[213] The financiers need the owner/manager's specialized human capital to generate the returns on their funds.[214] This illustration shows that, in a framework of separation of financing and management or in more standard terminology of ownership and control, at the heart of an agency problem there is an agency relationship between a principal and an agent.[215, 216]

Agency Problems

The agency problem is an essential element of the so-called contractual view of the firm developed by Coase, Williamson, Jensen and Meckling and Fama and Jensen, among others. An understanding of this agency problem is pivotal to the concept of *agency relationship* which is, as seen in the previous section, essentially a contractual arrangement (Ross 1973). Thus, it is not surprising that agency problems at the firm level arise basically because contracts between managers (decision or control agents) and owners (risk bearers) cannot be costlessly written and enforced.

Several conditions should be present for an agency problem to arise in an agency relationship. Firstly, a conflict of interest between the principal and the agent must

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capital, is both large and largely nondiversifiable." Otherwise, principals' risk neutrality preference it is a direct implication of their assumed ability to hold well-diversified portfolios.

[213] In the agency arrangement the principal is compelled to engage an agent because he is lacking the specialized skills and / or knowledge needed to perform the tasks involved in a given undertaking.

[214] In broad terms, external capital suppliers and the management team contract over (1) the control rights on how to manage the supplied funds, and (2) the allocation of parties' claims on future cash flow stream. Ideally, a (complete) contract specifying faultlessly all parties' actions, payoffs and penalties in all (possible future) states should be written. A complication arises, however, as it is widely recognized that it is "practically impossible to list the entire range of outcomes and contingencies that might affect contractual performance" (Al-Najjar 1995, 432). Therefore, complete contracting is technologically impracticable.

[215] Under the neoclassical theory of the firm the ownership of equity capital is without consequences concerning its (property) rights to residual control (see chapter II, section 3, p.14).

[216] This separation between owners and managers, is no more no less than a particular case of governor (principal) and representative (agent) relationship, designated in the literature by agency relationship. For a insightful discussion see Pratt and Zeckhauser (1985, 1:24)

develop. This condition, though necessary, is not sufficient, because in a world without uncertainty — with perfect observability of agent's actions — it would be possible, *ex ante*, to write an incentive contract to induce the agent to act in the principal's best interest.[217] Assuming that a binding contract laying down each party's obligation and payoffs for any conceivable eventuality in every possible future state of the world could be written at no cost, then the agency problem would disappear. So, the existence of the agency problem is also associated with the uncertainty — the imperfect *observability* of agent actions — and the costs of writing and executing contracts.

Agency Costs

Earlier we explained that agency problems arise because contracts are not costlessly designed, written, executed and enforced. In a world *à la* Modigliani Miller where transaction costs are assumed away, agency costs would naturally be nonexistent. However, as pointed out by the incomplete contract literature, transaction costs incurred in unforeseen future contingencies, and in writing and enforcing contracts are non-trivial (e.g., Tirole 1999, 743-4).

Jensen and Meckling (1976) were more specific in suggesting that agency costs are the sum of the out-of-the-pocket costs of structuring, administering, and enforcing contracts (both formal and informal) plus any residual losses involved.[218] Enforcing costs include both monitoring and bonding costs.[219]

Summarizing, agency costs include all costs frequently referred to as contracting costs, transaction costs, moral-hazard costs and information costs. [220]Generally, legal and institutional arrangements and capital structure transactions are devices suggested in the literature as helpful to mitigate the magnitude of agency problems and consequently ease its associated costs.[221]

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[217] It is equivalent to writing a complete contract. See, e.g., Tirole (1999) for further details and references to the related literature.

[218] According to Jensen and Smith (1985, 96) "[t]he residual loss represents the opportunity loss remaining when contracts are optimally but imperfectly enforced."

[219] Copeland and Weston (1988, 20) observe that "in most agency relationships the owner will incur nontrivial monitoring costs in order to keep the agent in line."

[220] Namely includes the costs associated with bankruptcy, the so-called *asset substitution* and *underinvestment* problems.

[221] Bolton and Scharfstein (1998, 101) argue that "[o]ne can interpret certain corporate governance arrangements and capital structures as attempts to mitigate agency problems" See, e.g., John and Senbet (1998) for a similar argument.

2.11.3. Capital Structure Decisions in a Positive Agency Theory Framework

In the last 20 years a significant research effort was undertaken in building a body of literature focusing broadly on the conflicts of interest between firm claimholders.[222] The intellectual foundation of this stream of literature is widely recognized to be associated with the pioneering work of Fama and Miller (1972) and the influential paper of Jensen and Meckling (1976).

As discussed earlier, agency problems arise in a separation of ownership and control framework in the sense of Berle and Means (1932).[223] Managerial self-interest behavior induced by managers' ownership holdings is thus of paramount importance as a potential source of economic inefficiency stemming from their decision-making behavior and congruity with owners' objective function.

Conflicts of interests do not arise exclusively from manager-shareholder agency relationships. Other claimholders, such as debtholders, also have vested interests in the firm. However, in this positive agency theoretical approach to corporate capital structure problems, we will be focusing on the more *emblematic* agency problems arising between managers and shareholders, and between shareholders and debtholders.[224]

Capital Structure Agency Problems

The most conspicuous agency problems related to capital structure decision, in both the academic and practitioner's literatures, are associated with incentive conflicts that stem from (incomplete) contractual arrangements among shareholders and managers, and shareholders and debtholders.[225, 226] These problems engender economic inefficiencies,

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[222] See Harris and Raviv (1991) for a survey of this literature.

[223] In this context, whenever professional managers, entrepreneur, and other corporate insiders are in control of the decision-making process of the firm we refer to them collectively as 'managers' or 'insiders'.

[224] We acknowledge the existence of other kinds of agency problems such as the ones resulting from conflicts of interest between controlling and minority shareholders, old and new shareholders. However the nature of their impact on corporate capital structure choice do not make them a primary concern for *this* study.

[225] Agency theoretical framework has also the ability to handle the conflicts of interests arising within the agency relationship between headquarters' managers and divisional managers established in *an internal capital market* setup. This issue is referenced in the literature as the internal capital market agency problem (see Bolton and Scharfstein 1998, Williamson 1985, 1975, among others).

[226] We adopted in this setting "debtholders" instead of (perhaps) the more traditional "bondholders", to acknowledge the ability of positive agency theory to, generally, address capital structure choices of firms of all sizes and issuing financing instruments in unequally developed financial systems, independently of being publicly traded or not. Several authors (see, e.g., Hand, Lloyd and Rogow 1982) suggest that agency theory is relevant in explaining small and medium firms' financial policy. Berger and Udell (1998, 629) express an opposing viewpoint arguing that, contrastingly, empirical evidence of the "1993 National Survey of Small Business Finances" is consistent with the argument that "agency problems […] in choosing capital structure […] that are driven by the separation of ownership and control are often irrelevant for small firms."

where adverse wealth effects have an influence on investors' valuation of firm securities and their willingness to supply funds.

Shareholder-Manager Agency Problems

Sources of Shareholder-Manager Problems

Typically, the most prevailing causes involved in shareholder-manager agency problems are: (1) managers' *level of effort*; (2) managers' *decision horizon preferences*; (3) *differential risk preferences* between managers and shareholders; (4) managerial *self-interested behavior*; (5) *overinvestment policy*; and (6) *firm's asset use* (see, e.g., Bird, Parrino, and Pritsch 1998, Jensen and Smith 1985, and Barnea, Haugen and Senbet 1985).

Concerning the level of effort in carrying out their managerial duties, it is well explained in the positive agency theoretic literature (see, e.g., Fama 1980, Jensen and Meckling 1976, and Ross 1973) that managers may have the incentive not to exert the appropriate (and expected by shareholders) level of effort.[227] The rationale for this managerial behavior might relate to managerial fractional ownership holdings, which allows them to capture (merely) the correspondent proportion of the economic surplus generated by the firm.[228]

Under current corporate laws, firms are incorporated aiming at a perpetual existence. Therefore, they exhibit longer time horizons than their managers whose personal tenures are shorter. Thus, managers may feel some pressure to achieve investment results sooner than stockholders. This problem may affect a firm's investment policy, particularly because of the potential to forego profitable investment opportunities with long expected maturities (see, e.g., Narayanan 1996; Jensen and Meckling 1979; and Furubotn and Pejovich 1973).

Managers, typically, are undiversified investors (of firm-specific human capital). In contrast, shareholders are assumed to hold well-diversified (financial asset) portfolios. By implication, managers tend to behave with *risk aversion*, while investors show *risk neutrality* (e.g., Amihud and Lev 1981; and Fama 1980).[229] These differential risk

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[227] Dybvig and Zender (1991, 215) assert that "usual agency-model trade-offs between incentives and risk sharing imply that the manager will not, at the entrepreneur's optimum, expend a first-best level of effort."

[228] Jensen and Meckling (1976) show that the smaller the manager's ownership holdings, the greater the incentive to shirk, or exert less than full effort in shareholders' value-enhancing activities.

[229] As suggested by Reagan and Stulz (1983) managers are indeed concerned with the firm's total risk even the component that can be diversified away.

preferences are the consequence of managers having so much of their own wealth tied up to the ongoing viability of the firm.[230]

Managers may pursue their own objective function, acting in their own self-interest instead of that of the owners. Attempts to insulate themselves from takeovers (e.g., by proposing changes in corporate charters and/or adopting *golden parachutes*) is an illustration of such behavior.[231] Another particularly acute agency problem is related to discretion of entrenched managers over a firm's capital structure.[232] Managers may show a preference for underleveraging because they (1) "desire to reduce firm risk to protect their undiversified human capital" (e.g., Fama 1980); (2) "dislike of performance pressures associated with commitments to disgorge large amounts of cash" (e.g., Jensen 1986). In contrast, Harris and Raviv (1988) and Stulz (1988) suggest that managerial entrenchment may induce overleverage as an attempt to increase voting rights and reduce the likelihood of takeover threats.[233]

Finally, managers may divert firm resources to their own personal ends misusing firm's assets or consuming unreasonable amounts of non-pecuniary resources, such as, luxurious offices, unnecessary jets and yachts, expensive company cars, memberships in clubs, and the like.[234] The incentive for managers to exhibit this type of behavior is a direct consequence of their fractional contribution to the costs inherent in their self-servicing conduct.[235] Monitoring is likely to be a solution for this problem. However, this kind of

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[230] Recently Fudenberg and Tirole (1995) hypothesized that managers' concern about (their) job security "creates an incentive for managers to smooth earnings in consideration of both current and future relative performance." This activity is anticipated by shareholders who incur in monitoring costs (auditing, for example) to mitigate the magnitude of this agency problem. Chaney and Lewis (1998) provide empirical evidence consistent with this hypothesis in a sample of 489 firms documenting a positive association between a surrogate for income smoothing and firm performance.

[231] According to Furubotn (1972, 1151) it "[…] seems true that the observed behavior of managers *does* deviate from the pattern that would insure profit maximization."

[232] Berber, Ofek and Yermack's (1997, 1411) conceptualize management entrenchment as "the extent to which managers fail to experience discipline from the full range of corporate governance and control mechanisms, including monitoring by the board, the threat of dismissal or takeover, and stock- or compensation-based compensation incentives."

[233] Berber, Ofek and Yermack (1997) suggest that entrenched managers may also overleverage a firm's capital structure as a signal of their willingness to restructure and therefore to preempt takeover threats.

[234] According to Furibotn and Pejovich (1972, 1151) the "manager's consumption of nonpecuniary goods was incorporated formally into the [economic] theory" after Becker's (1957) foundational contribution.

[235] As suggest by Wall (1988, 14), among others, "[t]he costs of overspending on nonpecuniary benefits are ultimately borne by the owner-manager as potential shareholders

behavior is not easily, readily and costlessly, observable. Therefore, in large corporations with widely dispersed ownership, where individual atomistic owners lack the incentive to expend the large (when compared with his investment) amounts of resources required to monitoring the behavior of managers, this problem may be more severe. A similar effect stems from new outside equity issues because insiders' ownership holdings are reduced, contributing to exacerbate self-serving behavior. In these instances, however, external investors anticipate future losses in value due to expected agency costs, and consequently adjust their valuations by the amount of those costs. This reduction in the firm' value is inevitably borne by the owner-manager, who has his wealth tied-up with it.

Mechanisms to Mitigate Shareholder-Manager Agency Problems

A number of organizational devices and market mechanisms are available to help in controlling agency costs inherent to the misalignment between shareholders and managers' objectives that lead to the exercise of managerial discretion (see, e.g., Agrawal and Knoeber 1996).

External Mechanisms / Competitive Markets Mechanisms

Extant competition in *product markets* exerts a disciplinary role over managers not running the firm in the shareholders' best interest. The suggestion, by Demsetz (1983, 379:380) that firms may become less price competitive if because too much cash flow was drained out of firm's prices escalate illustrates the argument.[236]

As pointed out by Fama (1980), among others, competitive *managerial-labor markets* by play a significant part in managers' *human-capital* valuation and therefore might be influential in lessening firm's agency problems. The value of managers' human-capital is typically contingent on their performance, and consequently tends to be tied up to compensation through such devices as *bonuses* and *executive stock options plans*.[237]

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reduce the price they pay for the new stock in recognition of management's increased incentive to spend on perks."

[236] Jensen and Meckling (1976, 22) although acknowledging that "it is frequently argued that the existence of competition in product (and factor) markets will constrain the behavior of managers to idealized value maximization," claim that their analysis does not support the hypothesis. See also Jensen (1986) for further considerations on the managerial disciplinary role of product and factor markets.

[237] Because in labor markets *à la* Fama (1980) managers bear their own reputation, equilibrium wages reflect managers' performance reputation. Besides the monetary compensation they earn from the firm, managers may also advantage (disadvantage) from labor market recognition as a source of enhancing (reducing) the value of their human capital, which may also be firm-specific leading to the correlative hold-up problems. According to Blair (1997, 8) "[…] firm-specific human capital is an important factor in determining the structure of many employment relationships." Additionally, reputation

Hence, writing managers' compensation contracts indexed to firm performance provides an incentive for managers to align themselves with shareholders' objective function.[238]

Financial markets play an important role in mitigating capital structure agency problems for three different reasons. First, *security markets* allow investors to liquidate their security holdings if the firm is not run to their best interests. Sell-offs by unsatisfied shareholders are likely to drive share price down, hurting managers' wealth through the link of compensation to stock performance. Additionally, new *journeys to market* may become unpredictably more hazardous.

A second major external factor in resolving agency problems is the *market for corporate control*.[239] This is a market where competing management teams, perceiving an opportunity to create value, bid for decision-making rights, while owners accept or reject the offers (Jensen and Ruback 1983). Substandard decision-making adversely affects share price and attracts bidders, increasing the likelihood that managers will be dismissed following an acquisition. This discipline is less effective when managers control large blocks of the firm's stock.

Lastly, and as argued by some scholars, the *market for contingent claims* can be useful in lessening some shareholder-manager problems through the use of specially designed financial securities. Notably, certain types of financial contracts which have embedded in them some particular contractual options-like features may contribute to solve and/or mitigate agency relationship (and asymmetric information problems) (see, e.g., Nöldeke and Schmidt 1995, DeFusco, Zorn, and Johnson 1991, Agrawal and Mandelker 1987, and Haugen and Senbet 1981).[240]

The banking literature has highlighted the distinctive monitoring function of banks. Several studies have advanced the unique monitoring role of banks and conclude that

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effects may provide managers perceived as more effective with more job opportunities and more highly rewarded, resulting in an incentive for the alignment of managers' and owners' objective functions.

[238] The effectiveness of tying managerial compensation to shareholders' wealth in aligning managers / equityholders objectives is a consequence of rendering managers residual claimants on the firm's future cash flow stream.

[239] Manne (1965) has to be credited for having coined the expression. Literature in the field includes, among others, Manne (1965), Jensen and Ruback (1983), Grossman and Hart (1980a, 1980b, 1981), and Harris and Raviv (1988).

[240] As hypothesized by Nöldeke and Schmidt (1995, 163) writing option contracts could be helpful in overcoming the Hart-Moore's (1988) underinvestment problem arising in a hold-up setting.

banks have a comparative advantage in serving this purpose. Stiglitz (1985), among others, argues for this disciplining role of banks.[241]

Internal Mechanisms / Direct Contractual Provisions

As suggested by Jensen and Meckling (1976), among others, managers' (residual) claims on residual return are likely to affect the magnitude of the agency costs of equity. Thus, arguably, managerial ownership of a firm's stock helps align the interests of managers with those of stockholders by increasing the costs to managers of shirking and/or excessive assets use. It also helps to reduce the horizon problem if share prices quickly adjust to reflect changes in corporate value. Large stock ownership by managers can create problems, however, if managers use the control to block beneficial takeovers or to exert some form of influence over the selection of the firm's directors.

Dispersed residual claimants in publicly held corporations are entitled to *voting rights*, a device through which they exert (either in person or by proxy) ownership control rights.[242] Exercising control in corporations by voting is required because someone must have the residual power to act (or delegate) when contracts are not complete. Managers' perception that shareholders' "claims could be aggregated and votes exercised at any time" complements monitoring as a device to provide the appropriate incentives to promote the alignment between managers and shareholders.

Monitoring managers is a popular alternative for controling managerial discretionary behavior. The monitoring mechanisms most frequently used include: (1) competition among managers for recognition and personal advancement; (2) monitoring by compensation committee; (3) managers' reciprocal monitoring (see, e.g., Jensen and Smith 1985, 102, and Furubotn and Pejovich 1972, 1151); and (4) monitoring by the board of directors (Hermalin and Weisbach 1998). *Managerial compensation* contracting defines the vector of payments to managers. It therefore performs a crucial role in attempting to minimize the misalignment of managers' and shareholders' objective functions.[243] Periodic

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[241] See also Diamond 1996, 1984, Lummer and McConnell 1989, Boyd and Prescott 1986, Stiglitz 1985, and Fama 1985.

[242] The right to vote in shareholders' meetings has a economic value, because voting shares generally trade at higher prices than non-voting shares (e.g., Grossman and Stiglitz 1977).

[243] Baker, Jensen and Murphy (1988) formalize two underlying principles of an economic theory of compensation (1) "models of compensation generally assume that higher performance requires greater effort or that it is in some other way associated with disutility on the part of workers;" and (2) "In order to provide incentives, these [compensation] models predict the existence of reward systems that structure

performance reviews and incentive compensation (beyond the base salary) in the form of accounting-based bonuses, grants of stock options, performance shares, stock appreciation rights, or restricted stock can alleviate a variety of agency conflicts.[244] However, the design of compensation plans is likely to lead to additional sources of conflict of interest between residual claimants and managers because of the structure of their respective payoffs.

A strong and independent *board of directors* can limit the divergences of managers and shareholders as to wealth maximization by closely monitoring managerial decision-making. In the most recent years *blockholder and shareholder activism* flourished steadily and broadly. Owners of large blocks of share holdings show greater incentive than small shareholders to monitor the activities of managers (e.g., Bolton and Von Thadden 1998). Similarly, institutional investors became more and more concerned about corporate governance problems, consistently exerting their influence in designing managers' compensation arrangement and in implementing monitoring solutions, both aimed at curtailing managerial discretion and making managers' payoffs sensitive to shareholders' wealth (e.g., Chakraborty and Baum 1998).

As suggested by Jensen (1986) and Stulz (1990), among others, financing and dividend policies are also helpful to inducing managers to run the firm in the owners' best interest. Because leveraging up the capital structure increases the likelihood of financial distress[245] and forces managers to distribute cash, it may provide the appropriate incentive for inducing managers to (1) raise their level of effort on managerial duties; (2) decrease the over-consumption of the firm's resources; and (3) avoid suboptimal investment policies. Buying back shares also contributes to reduce the agency costs of free cash flow. Finally, dividend payments (including specially designated dividends, see Gombola and Liu 1999) reduce internal funds subject to managerial discretion and force managers to

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compensation so that a worker's expected utility increases with observed productivity."

[244] Consistently with Murphy and Zimmerman (1993) and Weisbach (1988) Hermalin and Weisbach (1998) hypothesize that "accounting measures of performance are better predictors of management turnover than stock-price performance." The intuition behind this prediction is that whereas (accounting) earnings pertain to incumbent management team, stock returns, additionally, reflect investors' expectations about the performance of future management teams.

[245] Financial distress is costly for managers because they risk (1) losing their control rights; and (2) being adversely affected in their reputation in the managerial labor market, and therefore be deprived of the private rents associated to controlling the firm decision-making and to their own reputation on the labor market for managers (Grossman and Hart 1982).

finance growth with external funds, and therefore to subject themselves to greater capital markets scrutiny (e.g., Easterbrook 1984; and Rozeff 1982).[246]

Shareholders-Debtholders Agency Problems

Conflicts of interest between equityholders and debtholders are a consequence of the various forms of opportunistic behavior that allow owners to attempt to add to their own wealth at debtholders' expense. The opportunity for such behavior arises because debtholders, when designing their investment strategies, price their claims ex-ante based in pre-contractual assumptions related, for example, to leverage and dividend policies as well as to levels of financial and business risks. It is reasonable to assume that rational investors, aiming at maximizing their expected utility, will try to anticipate wealth effects arising from the incentives driving managers' decision-making. Since debtholders are able to anticipate, on average, the value effects of equityholders future decisions, they will not suffer losses unless they systematically underestimate effects of such future actions. However, if after debt has been issued, debtholder expectations about those future policies prove wrong, then debtholders are not able to reprice their claims in order to reflect increased marginal risk. Therefore, wealth transfers beneficial for equityholders will occur.

However, because debtholders tend to anticipate firm future policies and incorporate such expectations into the way they price their claims, the firm (and hence its equityholders) will incur agency costs from all those suboptimal decisions motivated by anticipated wealth transfers by debtholders. Therefore, writing contractual mechanisms that might control the severity of equityholder-equityholder conflicts could help in reducing these agency costs and therefore be value-enhancing at the firm level.

As we said earlier, various forms of opportunistic behavior might be able to create equityholder-debtholder agency problems. The so-called *claim dilution problems* are a consequence of equityholders either being able to liquidate the firm's assets and therefore increasing the risk (and reducing the value) of outstanding bondholders' claims, or as indicated by Jensen and Smith (1985), to issue additional debt with the same (or higher) priority. Furthermore, when there is (risky) debt outstanding, equityholders have *risk shifting* incentives since equity has a convex payoff structure that makes it benefit by

[246] It should be noted that dividend payouts are not definite commitments from managers to return cash flow to shareholders in the sense that these payments may be reduced or even eliminated.

shifting into higher risk projects even when the incremental NPV is negative (Jensen and Meckling 1976).

Unexpected increases in dividend payments, at the expense of reducing investment and/or issuing additional debt, represent another form of wealth transfer from debtholders to shareholders (e.g., Kalay 1982).

Suboptimal investment policies are another important source of equityholder-debtholder agency problems. As explained (Jensen and Smith 1985, 111) "the value of the stockholders' equity rises and the value of bondholders' claim is reduced when the firm substitutes high-risk for low-risk projects." Thus, equityholders can transfer value at debtholders expense by increasing investment risk after debt financing has been issued. This is known in the agency literature as the *asset substitution problem* (Jensen and Meckling 1976; Galai and Masulis 1976; and Jensen and Smith 1985).[247] Equityholders of firms with outstanding (risky) debt have incentives to forego profitable investment opportunities because a portion of the profits from investment projects accrues to debtholders while the costs of such projects are borne by equityholders. This type of opportunistic behavior has been popularized as the *underinvestment* problem (Myers 1977, 1984). Another problem arises when partial ownership and limited liability is present and equityholders are able to fully benefit from successful projects, but may not bear the total cost of negative NPV investments. This creates an incentive for *overinvestment* (Jensen and Meckling 1976).

As suggested by Gavish and Kalay (1983), among others, agency costs of debt are also positively related to financial leverage, and therefore the total agency costs of debt can be described as a monotonically increasing function of the firm's leverage ratio.[248]

Mitigating Mechanisms of Shareholder-Debtholders Agency Problems

Among the various mechanisms suggested to mitigate this kind of agency problem is (intensive) monitoring by debtholders.[249] However, because debtholders are assumed to

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[247] Gavish and Galay (1983) questioned this argument arguing that "shareholders' wealth increase from (following) an unexpected increment in the investment' risk, […] is not increasing monotonically with the firm's leverage ratio."

[248] Agency costs of debt include, in addition to the costs associated with the asset substitution problem, bonding, monitoring, and bankruptcy costs, as well as the costs associated with the underinvestment problem.

[249] A substitute monitoring device highlighted in the banking literature is the unique monitoring role of banks (e.g., Diamond 1984, Fama 1985, Boyd and Prescott 1986, and Lummer and McConnell 1989).

holding well-diversified portfolios and likely to incur free-riding they might not have the inappropriate incentives to engage in monitoring.[250]

An alternative mechanism to control conflicts inherent to financing policy is to impose restrictive covenants in debt contracts affecting financing, dividend, investment, and production policies (Smith and Warner 1979). However, as noted by several authors (e.g., Smith and Warner 1979; Malitz 1986) despite their effectiveness, writing covenants in debt contracts is costly and does not ensure the elimination of all agency problems.[251] Stulz and Johnson (1985) suggest collateralizing assets as a useful device to mitigate asset substitution and under-investment problems. However, when collateralization is not a valid option then a greater degree of monitoring might be appropriate. Firms that are intensive users of intangible assets are expected to carry less debt and to use short-term debt.

As suggested by Mikkelson (1981), Haugen and Senbet (1981), Barnea, Haugen and Senbet (1980) Smith and Warner (1979), Bodie and Taggart (1978), and Jensen and Meckling (1976), among many others, issuing hybrid financing instruments, such as convertible bonds, callable bonds, and bonds with warrants attached, might be helpful in lessening agency costs of debt.

Other mechanisms, such as using short-term debt, progressive debt payments, leasing arrangements, (Myers (1977) as well as monitoring mechanisms, such as the market for corporate control and delegated monitoring, are often suggested in the literature as complementary instruments to curb this kind of agency costs.

2.12. An Asymmetric Information Approach to the Firm's Capital Structure Decision

Introduction

One of the instrumental assumptions required by the Modigliani and Miller (1958) capital structure irrelevance theory refers to the *homogeneity of expectations* of capital market participants with respect to the firm's future cash flow stream. This assumption, which is a necessary condition for the M-M theory to hold, requires an economic

[250] The following section describes the free-rider problem.
[251] Costs of writing covenants include bonding and enforcement costs and legal liability to bondholders if a firm breaches contractual arrangements with third parties in an attempt to comply with covenants.

environment where investors possess *complete*, *perfect* and *costless* information about the *true* value of the firm.[252]

It is widely accepted that in financial contracting the parties typically do not have complete knowledge of *everything* they should know to make optimal decisions. Additionally, besides being incompletely informed, parties — insiders and outside investors — are in general also unequally informed.[253] This phenomenon of an unequal distribution of information among the contracting parties is well known in the literature as the *asymmetric information problem*. Furthermore, it is well established that the market failure in symmetrically distributing information flows among agents is not, first, costless and, second, introduces incentive problems in financial contracting. These incentives are potential impediments preventing prices from fully reflecting available information and therefore affecting the firm market valuation.[254] Thus, asymmetric information problems affect the distribution of wealth among market participants, and do play a role in resource allocation.

Asymmetric Information and the Firm's Financial Policy

Asymmetric information problems affect the firm's capital structure choice in several distinct ways. First, in the presence of asymmetric information, financial contracting tends to become more complex and, *ceteris paribus*, to increase transaction costs and thereby the firm's cost of capital. Second, a firm may be unable to reach — or have to withdraw — from its perceived optimal capital structure. Moreover, a firm seeking to maximize its shareholders' wealth may be lead into suboptimal investment decisions. Third, under asymmetric information, particular forms of financing contracting and monitoring mechanisms are required in order to minimize the costs accruing to financing.

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[252] *Asymmetric information* is conceptually distinct from *incomplete information*. If two market participants are endowed with similar information sets, they both are symmetrically informed. However, if in those information sets there are any "random variables whose exact value is unknown" (Macho-Stadler and Pérez-Castrillo 1997, 17) then these agents are incompletely informed.

[253] As acknowledged Leland and Pyle (1977) "[n]umerous markets are characterized by informational differences between buyers and sellers", and "[i]n financial markets, informational asymmetries are particularly pronounced"

[254] Disagreements among contracting parties are likely to arise when: (1) contract environment is uncertain and information is incomplete, imperfect, and costly; and (2) outcomes are non-observable. As Ricketts (1994, 128) explains "[a] firm is a particular type of contractual environment, and its characteristics would be, ultimately, expected therefore to be molded by the sorts of considerations as an institutional consequence of uncertainty, opportunistic behavior resulting from imperfect information."

However, these arrangements are not costless and naturally affect (adversely) the firm's cost of capital.

In the absence of M-M's (1958) *homogeneous expectation assumption* it is reasonable to presume that firm insiders, arguably, are endowed with more information (*private* or *inside* information) about the firm than their counterparts, the outside investors. In this framework, the firm's financial policy — financing and dividend choice — emerges as a matter of relevance. It has been shown (e.g., Ross 1977, and Leland and Pyle 1977) that financial policy, when used to reveal private information to capital markets,[255] contributes to eliminate (or mitigate) the severity of the informational gap between firm's insiders and outsiders.[256] This behavior becomes crucial if value-maximizing insiders attempt to preclude the investor mispricing of the firm's securities, which would increase the cost of capital. If, because of their *informational deficit*, investors cannot, *ex-ante*, discriminate *good* quality firms from *bad* quality firms, they would not be willing to price securities higher than the one that reflects the average quality of issuing firms. In this setting, a better than average quality firm will refrain from issuing because its securities are underpriced (in the sense that their price is lower than its perceived intrinsic value). Only a bad quality firm will be willing to issue, because its securities are overpriced (in the sense that their price is higher than its perceived intrinsic value).[257] Consequently, in the absence of an information transfer that rebalance the level of information between insiders and outsiders, the market may perform poorly or not work at all.[258] Thus, asymmetric information is potentially a significant deterrent to competitive market equilibrium.

The emergence of asymmetric information problems does not necessarily require a principal-agent environment,[259] although they both may, eventually, overlap in certain

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[255] Typically, the main purpose referred in the capital structure literature for insiders to engage in *signaling* activity is to convey their perspectives about the firm's future cash flow stream, and therefore its valuation.

[256] The insight that there is an information content in firm's financial decisions and that these decisions are a mechanism to convey information from insiders to capital market participants is generally credited to Miller and Modigliani (1961).

[257] A related but peripheral subject relates to the approach used by managers to price firm's securities. It is relatively indisputable that the *intrinsic value* is consistent with the tenets of modern corporate finance theory.

[258] This line of reasoning reflects Ackerlof's (1970) argument he presented in his landmark paper as the "*market for lemons*". It is referred to as the "lemons problem" since it resembles the problem of lemons in the used car market. As a result of this adverse selection problem, very few (if any) 'good' used cars will come to the market leaving 'lemons'. Therefore, the used car market will then function poorly and, indeed, may not function at all. Another example relates to insurance buyers. Adverse selection deters low risk insurance buyers from the market, leaving only high-risk buyers.

[259] This is certainly the case of a setting in where the management team holds a 100 percent firm ownership.

circumstances. As previously discussed,[260] financial contracting arrangements underlying agency relationships are inherently incomplete (Aghion and Bolton 1992) and, generally, presume the presence of unevenly distributed information among the parties. If in this setting a conflict of interest over (assumed diverging) objective functions of principal and agent arises, then an important verifiability feature of their contractual arrangement should be based in terms of verifiable actions, otherwise it may not be enforceable by an impartial entity, say, a court of law.[261] In a shareholder-manager framework, if principal and agent are dissimilarly informed, with the latter having an informational advantage, then the latter will have "a certain leeway in order to enhance their own utility instead of that of the shareholders." (Macho-Stadler and Pérez-Castrillo 1997, 6). However, if the parties in an agency relationship obtain the appropriate incentives and their objectives converge (lessening the severity of their conflict of interest), "then all relevant information will be automatically revealed, and so any asymmetry in the distribution of information becomes irrelevant." (Macho-Stadler and Pérez-Castrillo 1997, 6).

Asymmetric Information Problems in Financial Contracting

Pioneering contributions of Ackerlof (1970),[262] and Spence (1973),[263] and more recently of Crawford and Sobel (1982), fostered the development of informational asymmetry-based theories.[264, 265 266] These authors offered the breakthrough insights that

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[260] See the prior section.

[261] As suggested by Macho-Stadler and Pérez-Castrillo (1997, 6) "information is related to the set of variables that are verifiable in a contractual relationship."

[262] Akerlof (1970) shows that a market may function very badly, or not function at all, if the informed party has no way to signal the quality of the good it is selling.

[263] Spence (1973) asserts that the signal that it is sent by the informed party has a cost that depends on its type so that, roughly speaking, higher types are more likely to send stronger signals. This signal may help then the uninformed party to distinguish the different types.

[264] Crawford-Sobel (1982) show that even if the signal is purely extrinsic (if it has no cost for the informed party) and thus constitutes cheap talk, both parties may still coordinate on equilibria that reveal some information.

[265] It is generally acknowledged in the literature, that Akerlof (1970) and Spence (1974) developed the underpinnings of the signaling theory approach. Akerlof studied the behavior of buyers and sellers in second-hand car market, the so-called *market for lemons*. Spence characterized signaling for labor market. Spence defines a signal as a "manipulable attribute or activity which conveys information." Ross (1977) and Leland and Pyle (1977) pioneered the adoption of the signaling theory framework to corporate financial structure problems. Two important papers that have applied the lemons problem analysis to financial markets are Myers and Majluf (1984) and Greenwald, Stiglitz, and Weiss, (May 1984).

[266] Harris and Raviv (1991) were very assertive when assessing the prospects of new asymmetric information theory to explain corporate capital structure choice: "the asymmetric information approach [with regard to further theoretical work] has reached a point of diminishing returns."

information is neither costless nor evenly distributed among economic agents, and this fact is consequential in terms of the economic wealth of contracting parties.

Differential distribution information among buyers and sellers of financial instruments limits their ability to ascertain the true characteristics of firms, entrepreneurs, and projects. This situation has the potential to induce behavior to opportunistically take advantage of informational superiority. The prototypical problems of asymmetric information are the *adverse selection problem*, the *moral hazard problem*, and the *free-riding problem*.

The Adverse Selection Problem in the Security Markets [267, 268]

Assume several wealth-constrained entrepreneurs were endowed with investment opportunities all costing, *C*, and promising a random expected return, *R*, drawn from some probability distribution. Assuming that probability distributions are different across entrepreneurs, then financiers may face a *selection problem* if they have a preference for investing in projects with a specific return probability distribution.[269] However, they do not have that information. This problem is an *ex ante* form of information asymmetry, because it arises before the parties are engaged in any kind of binding contractual arrangement.[270]

This is the prototypical *lemons problem*,[271] occurring in debt and equity markets, when potential investors are unable to discriminate between *good quality* and *bad quality* issuers.[272,273] As briefly noted earlier, in this setup, an investor will only be willing to pay a price that reflects the *average* quality of issuing firms — a price that lies between the value

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[267] As suggested by Hubbard (1998) "With imperfect information about the quality or riskiness of the borrowers investment projects, adverse selection leads to a gap between the cost of external financing in an informed market (which contains a "lemons" premium) and internally generated funds."

[268] An excellent survey of the literature on information and financial structure that expands on the topics discussed in the rest of this section is contained in Gertler (1988).

[269] Macho-Stadler and Pérez-Castrillo (1997, 11) suggest than adverse selection problems "appears when *the agent holds private information before the relationship is begun*" (italicized in the original). In these instances agent's behavior is observable and verifiable. The basis for the study of adverse selection problems is the theory of mechanism design is so much that some authors also call adverse selection models "mechanism design problems". Other terms sometimes used are "self-selection" and "screening".

[270] Potential allocational effects of adverse selection have been addressed by Rothschild and Stiglitz (1975) and Ryley (1975, 1976). Jaffee and Russel (1976) and Stiglitz and Weiss (1981) applied it to loan markets, and Myers and Majluf (1984) to equity markets.

[271] Described and formally characterized by Ackerlof (1970).

[272] On the basis of expected cash flows and risk.

[273] This type *ex ante* asymmetric information is at the outset of the phenomenon of adverse selection on the credit market (Stiglitz and Weiss 1981). In this setting, the interest rate is not a good regulating mechanism

of securities from bad and good issuers. If the owners or managers of a good issuing firm have better information than investors and *know* that they are a good issuer, and therefore they know that their securities are undervalued and they will not want to sell them to the investor at the price he is willing to pay. The only firms willing to sell securities will be bad issuers because the price is higher than the securities are worth.[274] Investors do not want to hold securities in bad firms and thus will decide, ultimately, not to purchase securities at all.

Thus, adverse selection problem arises when the lesser-informed participant in a transaction assumes that the better-informed participant intends to exploit his/her informational advantage, given that one contracting party characteristic(s) is (are) imperfectly observed by the other party. Hence, adverse selection problems are, in general, resolved by conveying private information that signal to less well-informed parties the intrinsic characteristics of the issuer.

In adverse selection problems were present in debt markets, then potential borrowers who are the most likely to produce an undesirable (adverse) outcome — a *lemon* — are the ones most actively seeking a loan and thus are most likely to be selected. Since the adverse selection problem makes it more likely for bad credit risks (*lemons*) to get loans, lenders may decide not to make any loans at all, even though there are good credit risks in the marketplace.

Security markets then, like Ackerlof's used car market, will not be allocationally efficient because few firms will be able to sell their securities and raise capital, hence preventing debt and equity markets from being effective and efficient in allocating resources to consumption and investment.[275] Moreover, adverse selection provides an

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for the market. A rise in rates may induce low-risk borrowers to leave the market, remaining only the high-risk borrowers.

[274] Bad quality issuers have therefore an incentive to misrepresent their quality as issuers since this conduct would enable them to earn economic rents.

[275] The *adverse selection* argument is helpful in explaining why in no country in the world are publicly traded securities the primary source of firm's financing. Additionally it also helps to explain at least partially, why equity capital is not the predominant source of financing for firms. Lastly, the argument can provide a rationalization for the break down in debt markets, too. It is well known that investors willing to buy a bond require an expected rate of return commensurate with the average default risk of the good and bad bond issuers. In these instances, a good bond issuer soon realize that he will be paying an higher interest rate than he should and therefore he is unlikely to borrow in this market. Actually, only the bad issuers will be willing to sell their bonds. However, and since investors are not anxious to buy these bonds, they will probably will stay away of this market.

explanation for the pervasive *underinvest problem*, which may preclude firms from undertaking profitable investment policies.

Solutions to Adverse Selection Problem

With evenly distributed information adverse selection problems would be absent, and as investors could, then, distinguish good quality from bad quality issuers, and be willing to pay the true value of securities issued by good firms, and good firms would consequently be willing to sell their securities in the market. The securities market would then be able to move funds to the good firms that had the most productive investment opportunities. The solution, then, to the adverse selection problem in security markets is to release information that eliminates asymmetric information and allows market participants to have full information about the individuals or firms seeking to finance their projects.

One way to get this information to market participants is through the private production and sale of information. However, this can not completely eliminate the adverse selection problem in security markets, in part because of the so-called *free-rider problem*. This occurs when investors are unwilling to expend additional resources to acquire information and attempt, instead, to take advantage of information that other investors have paid for. Such free riding behavior discourages the private production and sale of information as a solution to adverse selection.[276]

An alternative solution to the adverse selection problem might be for government to intervene by either supplying free information or by structuring regulation so as to induce issuers to reveal their true characteristics.[277] Both mechanisms may work to curtail the informational asymmetry and reduce the potential for adverse selection behavior, but will not be able to entirely remove it from security markets.

The presence of an intermediary, as in the earlier used-car market example, with unique expertise in gathering, processing and disseminating information about the quality

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[276] A rational investor spends resources in acquiring information, on good quality and bad quality firms, if that investment promises an expected positive NPV. Therefore, *our* knowledgeable investor believes that the information set is worthwhile because we will end-up purchasing good quality firm's securities that are undervalued. However, a *free-rider* may just replicate the same buying behavior without having paid for the information set. Recurrent free-riders will shift demand for good quality firm's securities upwards, and the new equilibrium price will eliminate security undervaluation. Then, is no longer possible to buy securities under their true value, and therefore no abnormal returns from investing in the information set are available. Additionally, demand for information is likely to decline and this may impair the private production and sale of information, worsening the severity of adverse selection problems in security markets.

[277] For instance, requiring firms selling their securities in public markets to adhere to standard accounting principles and to disclose information about their operations, assets, and earnings.

of firms may be another effective device for mitigating adverse selection problems. It has been shown, e.g., by Diamond (1984), that this role is performed in financial markets by financial intermediaries (such as banking firms) who are increasingly seen as delegate-monitors and serve in a *certification role* in financial markets.[278]

Because of its lending business, banks are heavily engaged in producing information for which activity they are able to earn rents from economies of scale. An important element in the ability of the bank to profit from the information it produces is that it avoids the free-rider problem by making primarily private loans rather than by purchasing securities that are traded in the open market. Because a private loan is not traded, other investors cannot watch what the bank is doing and bid up the loan's price so that the bank receives no compensation for the information it has produced. The bank's role as an intermediary that holds mostly non-traded loans is the key to its success in reducing asymmetric information in financial markets.

Our analysis of adverse selection also explains which firms are more likely to obtain funds from banks and financial intermediaries rather than from the public security markets. The better known a corporation is, the more information about its activities is available in the marketplace. Thus it is easier for investors to evaluate the quality of the large corporation and determine whether it is a good or a bad firm. Because investors have fewer concerns about adverse selection with well know corporations, they will be willing to invest directly in their securities. It could thus be hypothesized that the larger and more mature a corporation is, the more information investors have about it and the more likely it is that the corporation can raise funds efficiently in security markets.

Collateral, which is property rights promised to the lender in case of borrower default, reduces the consequences of' adverse selection because it reduces the lender's losses in the event of a default. The presence of adverse selection in credit markets thus provides an explanation for why collateral is an important feature in many debt contracts.

Equity capital performs a role similar to dedicated collateral. In default states, a high equity capital implies a higher ratio of assets to liabilities and an increased likelihood of the firm being able to pay off its loans without resorting to asset fire-sales. Hence, when firms seeking credit have high net worth the consequences of adverse selection are less important and lenders will be more willing to make loans.

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[278] See the chapter 4 for further details.

Moral Hazard and Debt and Equity Contracting

Moral hazard behavior occurs whenever (after the parties are committed to financial contracting arrangement) the seller of a security has incentives to hide information and engage in post-contractual activities that are undesirable for the investor.[279] Moral hazard is a material impediment to the dependable flow of information between market participants, making the verification of true characteristics by outside parties costly or even impossible. Hence, moral hazard has important efficiency consequences for a firm interested in raising funds through debt contracting rather than an equity offering.

As suggested by Greenbaum and Thakor (1995, 228) the most notorious and recurrent moral hazard problems in firms' capital structure transactions are (1) the asset substitution problem; (2) underinvestment problem; and (3) the managers' inadequate effort supply problem. In general, incentives (and disincentives) resolve moral hazard problems and preclude subsequent opportunistic behavior.[280]

Moral Hazard in Equity Contracts: The Principal-Agent Problem

Equity security contracts are exposed to a particular type of moral hazard that is called the *principal-agent problem*. As previously described, a diffuse ownership structure leads to the separation of ownership and control. In this setting and with risk averse managers, moral hazard behavior arises when financiers are unable to observe insiders behavior, and when agents pursue their own interests, rather than those of principals. In this situation managers have less incentive to maximize stockholders' wealth. These principal-agent problems can be severe. Managers over-spending the firm's resources on perquisites for themselves provide an illustrative example. In addition, managers might pursue growth strategies that would enhance their own reputation and / or power but not increase the firm's value. These problems would not emerge if principals were endowed, *ex ante*, with complete information about agents' actions, or could costlessly observe and

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[279] Salanié (1997, 107) characterizes a moral hazard occurrence when "(a) the Agent takes a decision ('action') that affects his utility and that of the Principal; (b) the Principal only observes the 'outcome', an imperfect signal of the action taken; and (c) the action the Agent would choose spontaneously is not Pareto-optimal." Macho-Stadler and Pérez-Castrillo (1997, 9) emphasize the non-verifiability of agent's actions and the *ex post* allocation of his private information. See also Milgrom and Roberts (1992). Prescott (1999) provides recent and comprehensive survey of moral hazard models.

[280] As suggested by Kreps (1990, 577) moral hazard problems can be handled by "structuring a transaction so that the party who undertakes the action will, in his own best interests, take actions that the second party would prefer."

verify their behavior. Thus, in this setting the principal-agent problem only arises because of an asymmetrical distribution of information.

As we have already discussed the unequal distribution of information favoring the firm's insiders (agents) and their unobservable behavior underlie the principal-agent moral hazard problem. Principals, however, may attempt to lessen the severity of the problem by engaging in (costly) information production, by monitoring agent's actions and by contractual performance. Hiring an auditing firm to frequently check what the management is doing is a feasible strategy to for pursuing effective monitoring.[281]

As with adverse selection, free-riding behavior adversely affects the amount of information produced which could reduce the intensity of the principal-agent problem. Consequently, the free-rider problem decreases the level of monitoring, which worsens the moral hazard problem in equity security contracting making it harder for firms to raise capital efficiently. As has been pointed out, financial intermediaries are an alternative mechanism with the ability to avoid the free-rider problem when there is moral hazard.[282]

Lastly, the government does play a role in providing incentives aimed at reducing the moral hazard problem created by asymmetric information. It is widespread practice for governments to promulgate binding norms to force firms to adhere to standard accounting principles and disclosure requirements aimed at making information verification easier, more transparent and more informative.

Moral Hazard in Debt Contracts

Because of its contractual compulsory payment schedule, a debt contract is typically designed to curtail opportunities for debtor's moral hazard behavior and to reduce the effectiveness lender's monitoring activities.[283] This unique feature of the debt contract can make it, under these instances, an optimal contract. Within this framework, the lender's verification concerns are likely to become acute only when the perceived

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[281] *Costly state verification* makes the equity contract less attractive and it explains, at least partially, why external equity is not a major source of firm financing.

[282] A venture capital firm is a particular kind of financial intermediary, which is helpful in mitigating moral hazard arising in a principal-agent setting. In venture capital contracting, provisions of performance verification are likely to be structured in order to allow the financier to monitor and secure information about insiders' non-publicly observable behavior and ascertain about the firm's activities and performance. Because firm's securities publicly trading is severely constrained under venture capital financing arrangements other market participants are unable to free-ride. Therefore, the venture capital intermediary is able to reap the full benefits of its informational investments.

[283] Furthermore, the diversification effects of lender portfolios provide another incentive to lowering monitoring activities.

likelihood of a default-state arising becomes material.[284] Hence, debt contracts imply implying less intense monitoring requirements and consequently diminished costs of state verification.

As seen in the prior section, debt contracts are subject to moral hazard behavior to the extent a firm's shareholders have an incentive to incur *risk-shifting* behavior, either by *asset substitution* or by (2) *claim dilution* (e.g., see previous section).

Solutions to Moral Hazard in Debt Contracts

A borrower is less likely to engage in moral hazard behavior if he has some of his wealth tied up in the debt contract arrangement. Such a contractual provision makes the debt contract incentive compatible, *i.e.*, aligns the incentives of the borrower to that of the lender. Hence, writing (restrictive) covenants, which preclude undesirable behavior or encourage desirable behavior, is helpful in reducing the moral hazard risk in financial contracting, although it cannot eliminate the problem entirely.[285] As argued by Hart (1995), it is almost impossible "to anticipate all the many things that may happen" and writing them in detailed contracts, including a full range of covenants to would rule out every potential risk-taking activity. Furthermore, borrowers may have the ability to find loopholes in the restrictive covenants, rendering them ineffective. Additionally, borrowers' compliance with restrictive covenants must be monitored and enforced.[286] Because monitoring and enforcement of restrictive covenants are costly, the free-rider problem is also likely to arise in debt markets in the same fashion as it does in equity markets.[287]

As previously explained, financial intermediaries, particularly banks, have the ability to avoid the free-rider problem as long as they focus on private loans. Private loans are not traded, so no one else can free ride off of the intermediary's monitoring and enforcement of the restrictive covenants. The intermediary making private loans thus

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[284] If such a state occurs and bankruptcy is present, the lender then tends to exhibit an equityholder-like behavior, as he becomes a *residual claimant* too.

[285] Covenants may be categorized in four classes: (1) covenants restraining the borrower from engaging in the undesirable behavior of undertaking risky undertakings; (2) covenants inducing the borrower to engage in desirable activities to make it more likely he fulfills his contractual obligations; (3) covenants to motivating the borrower to keep the collateral in good condition and in his possession; (4) covenants requiring the borrower to provide information about its activities periodically.

[286] A restrictive covenant is meaningless if the borrower can violate it because he knows the lender is not checking up on him or is unwilling to pay for legal proceedings started if the covenant is violated.

[287] It is unsubstantiated that, within actual legal system, enforcement is always possible.

receives the benefits of monitoring and enforcement and will work to shrink the moral hazard problem inherent in debt contracts.

Asymmetric Information Theories of Firm's Capital Structure

The incorporation of the asymmetric information problem into the firm's capital structure choice has developed, essentially, along two major approaches.

The Signaling Hypothesis

In his 1977 and 1978 papers, Stephen Ross developed an *incentive signaling approach* to the determination of the firm's capital structure problem.[288] He makes a compelling argument that the market value of a firm depends on perceived cash flow and thus, the perception of investors is important. By adjusting the firm's capital structure, insiders may be able to alter the market's perception of the firm's risk class, thereby maximizing its market value and consequently achieving a unique optimal capital structure. Ross' model describes and explains insiders' behavior in using financing policy to signal their beliefs to the market, and thereby encourage fair pricing of the firm's securities. A key requirement for insiders to effectively transmit information signaling the characteristics of the firm is that the signal they transmit to market participants is credible. Arguably, the credibility of the signaling activity should be strongly and positively correlated with its cost. Otherwise, bad quality firms could render it totally ineffective (and even counterproductive for value-maximizing good quality firms) once insiders of bad quality firms could easily replicate the signal and mimic god quality firms' signaling behavior.[289]

Furthermore, he hypothesizes that firms issuing external equity securities are more likely to have poor prospects, otherwise they would be issuing debt securities. Hence, firms with poor prospects will want to share their *downside* with other new claimants, whereas a firm with good prospects will not want to share its *upside* with new claimants.[290]

In addition Ross hypothesizes that good quality firms will issue more debt, as has already been discussed. Furthermore, he demonstrates a positive relationship between risk

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[288] Signaling is similar to an adverse selection problem in the sense that an agent, after learning his type and before contractually committed, "*can send a signal that is observed by the principal*" attempting to "influence the principal's beliefs about the agent's identity" Macho-Stadler and Pérez-Castrillo (1997, 12). Italicized in the original.

[289] The qualification as a *money burning* signal is contingent on the verification of two conditions criteria: (1) the pure dissipative nature of the signal and (2) its cost evenness among signaling firms (see, e.g., Daniel and Titman 1995).

[290] This problem could also be viewed as an agency problem between existing and future shareholders.

and level of debt (the latter being driven by his assumption of uniformly distributed expected returns).

In Hayne Leland and David Pyle's (1977) model, an entrepreneur seeks additional equity financing for a single new project. In the model, a moral hazard problem limits the free flow of information between market participants. Moreover, insiders cannot be expected to be entirely straightforward about the firm's characteristics or about the project in question, since there may be substantial rewards for exaggerating positive qualities. Additionally, verification of 'true' characteristics by outsiders can be costly. Insiders know the project's expected return, but investors do not.

In their setup Leland and Pyle suggest that an entrepreneur in a high quality firm should use his retained share of ownership to signal the firm quality type. In result, the entrepreneur might be unable to hold a well-diversified portfolio because of the retained share of ownership he used as a signal. This loss in *diversification*, however, is costly and thus credible making it difficult and unattractive to be mimicked by bad quality firms.

Leland and Pyle argue that the fraction of project's ownership that the entrepreneur is willing to hold "can serve as a signal of project quality." The inverse relationship between insider ownership and the variance of the expected returns, and that of debt and risk (unlike Ross' result), leads the authors to conclude that firms with high inside ownership are more likely to sustain high levels of debt because of the greater demand for funds by (insider) managers.

There are wo testable predictions of Leland and Pyle's signaling hypothesis: (1) "is that if the original founders of a company going public decide to keep a large fraction of the stock, then these firms should experience greater price earnings multiples;" (2) if the firm's value is positively related to the fraction of the owner's wealth held as equity in the firm, then the firm will have greater debt capacity and will use greater amounts of debt." Although debt is not a signal in this model, its use will be positively correlated with the firm's value." (Copeland and Weston 1988, 503).

Lee, Thakor, and Vora (1983) posit that both the capital structure of the firm and the maturity of its debt serve as signals of the firm's future earnings. This study differs from Ross (1977) in that the former use both the size and the maturity of debt as signals, and allows for costly information. Moreover, the study demonstrates that, even in the

absence of stochastic term structure of interest rates, debt maturity is important because it conveys information about the firm's future earnings. Unlike Flannery (1986), the authors argue that good quality firms will issue long-term debt in order to signal the long life of their assets and thus of their associated cash flows.

Bhattacharya (1979) assumed that outside investors have imperfect information about the firm's profitability and that cash dividends are taxed at a higher rate than capital gains. He demonstrated that dividend policy may be effectively used as a signaling device. In the absence of an explicit cash payout, ex-post cash flows cannot be communicated without moral hazard. Higher dividends are favorably valued. On the negative side, higher taxes on dividends are the cost of signaling. The costs and benefits of signaling with dividends lead to an optimal level of dividends.

Flannery (1986) hypothesizes that corporations can successfully signal their true value to the potential investors by choosing the appropriate maturity for their debt issues. High quality firms, according to the author, have an incentive to provide correct information about their investments' profitability so as to avoid overpaying interest to the debtholders. In order to accomplish this, high quality firms will choose to issue short-term debt. Low quality firm cannot mirror this behavior because of the high transaction costs associated with successive issues of short-term debt.[291]

Flannery (1987) examined informational asymmetry in risky debt maturity choices. He argued that maturity choice is irrelevant when information is shared between outside investors and insiders. However, if the firm's insiders have better information than outsiders do then debt maturity decisions can be used as a signal of the firm's future prospects. He showed that issuance of short-term risky debt may be viewed as a positive signal because it reflects the confidence which inside managers have regarding the firm's future cash flows. In contrast, long-term debt is viewed as a negative signal. The type of equilibrium, whether pooling or separating, will depend upon the quality of the firm under scrutiny and debt underwriting costs.

In a model with asymmetric information about borrower's type, Diamond (1991)

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[291] For a discussion on determinants of debt maturity see Kraus (1973), Stiglitz (1974), Morris (1976), Brennan and Schwartz (1978), Boyce and Kalotay (1979), Kane, Marcus and McDonald (1985), Brick and Ravid (1985, 1991), Lewis (1990), Brick and Palmon (1992). Barclay and Smith (1995), Stohs and Mauer (1996), Guedes and Opler (1996), Barclay and Smith (1996)

shows that higher quality firms (with higher credit ratings) should choose short term debt because they will be able to take advantage of the revelation of future good news. This positive information effect outweighs the risk of not being able to refinance oneself and running the risk of being liquidated by the lender (the liquidity risk). The opposite is true for firms with lower credit ratings. However, still lower rated borrowers can only issue only short-term debt, so that the relationship between length of maturity and credit rating is non-monotonic.[292]

The Myers and Majluf (1984) model frames, in a differential information setting, the implications for the investment and financing policies of limited internal funding.[293] The authors assume that the transmission of information is costly, managers are (existing) shareholders' wealth maximizers, and firms have to issue equity to undertake new profitable investments. It is shown that old shareholders may or may not benefit from the new investment decision. The final outcome depends on whether the market underestimates or overestimates the value of the investment. In particular, if the market underestimates the value of the new investment, the new shareholders will own a higher percentage of the corporate earnings than they deserve. When the truth about the "intrinsic" value of the firm is revealed, the old shareholders will find themselves in a worse position because their ownership is diluted. If, however, the market overestimates the value of the new investment, the opposite occurs, with old shareholders expropriating wealth from the new ones. In this case, the old shareholders will receive the majority of the proceeds, although their participation in the investment outflows is low. Since firms gain the most by issuing equity when the firm is overvalued, new equity issues are perceived as negative signals by the market and are followed by decreases in the stock prices. This analysis shows why firms rely extensively on retained earnings to finance new investments. If internal funds are depleted, corporations will choose to issue debt rather than equity to invest in a profitable project, a result that illustrates the "*pecking order hypothesis*".

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[292] The prediction of a positive association between firm quality and the amount of short-term debt issued is also found in Kale and Noe (1990). In equilibrium, better firms will issue more short-term debt and worse firms more long term debt.

[293] The model assumes that risk-neutral investors need new equity capital to fund a profitable investment opportunity. Additional equity capital is required, perhaps because of existing restrictive debt covenants or to avoid higher bankruptcy costs. Firm's management is also assumed to maximize shareholders' wealth and to know the firm type, while investors do not. These are presumed to retain their equity holdings and do not purchase any part of the new offering. Risk-free rate is zero and equity markets price new equity issues at their intrinsic value.

The Pecking Order Hypothesis

This theoretical argument was formalized by Myers (1984) but first put forward by Gordon Donaldson (1961).[294, 295] In the Myers (1984) and Myers and Majluf (1984) papers, managers have an informational superiority about the prospects of the firm compared to capital markets participants. In this framework they will be unwilling to issue equity to fund investment projects if the equity is undervalued. Otherwise, they will show a preference for issuing overvalued equity securities. Thus, an equity issue has to be regarded as a *bad signal*. Myers (1984) uses this kind of rationale to develop a pecking order theory of financing. Instead of using equity to finance investment projects, it will be better off using less information-sensitive securities. Internal equity is most preferred, with debt coming next and, finally, equity.

The results of these papers and the subsequent literature (such as Stein 1992 and Nyborg 1995) are consistent with a number of stylized facts concerning the effect of issuing different types of security on stock price and the financing choices of firms. However, in order to derive them, strong assumptions must be made, such as managers' overwhelming bankruptcy aversion.

In Noe (1988) the pecking order also breaks down. His model differs from Myers and Majluf in that insiders observe the firm's cash flows imperfectly. Brennan and Kraus (1987) and Constantinides and Grundy (1989) show that if the set of securities that the firm can issue to finance a new project can be expanded, the pecking order hypothesis no longer holds.

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[294] Gordon Donaldson (1961) suggests that managers prefer internal funds because "internal financing is the line of least resistance" and "are funds over which management has complete control." Using internal financing "avoids the glare of publicity...which accompanies the decisions and actions of management if [investment is] externally financed" (Donaldson, 1961, 54). William Baumol (1965, p.74) also suggested a "financing hierarchy" argument, arguing that "[i]t would appear that the bulk of business enterprise should finance its investment insofar as possible entirely out of retained earnings *because that is, characteristically, the cheapest way to raise additional funds*. Only when it becomes impossible to provide enough money from internal sources should the firm turn to the stock market or to borrowing for resources" (emphasis in original).

[295] Baumol (1965, p.74) argue that "[i]t would appear that the bulk of business enterprise should finance its investment insofar as possible entirely out of retained earnings because that is, characteristically, the cheapest way to raise additional funds. Only when it becomes impossible to provide enough money from internal sources should the firm turn to the stock market or to borrowing for resources" (emphasis in original). The author, however, neither explains why internal equity is "the cheapest way to raise additional funds," nor indicate the source and magnitude of the *economic burden* that render external equity and debt financing cost disadvantageous.

Megginson (1997) pecking order hypothesis is based on two key assumptions: (1) managers are better informed then outside investors about the investment opportunities faced by their firms (the standard asymmetric information assumption); and (2) managers act in the best interests of *existing* shareholders. This model has won converts because it can explain: (1) why debt ratios and profitability are inversely related; (2) why markets react negatively to all new equity issues and why managers seem to make such issues only when they either have no choice (following an unexpected earnings decline) or they feel the firm's shares are over-valued; and (3) why managers of even highly-regarded firms choose to hold more cash — and issue less debt — than either the trade-off theory or common sense suggest they should. Whereas the trade-off theory explains observed corporate debt *levels* fairly well, the pecking order theory offers a far superior explanation for observed capital structure *changes* — especially those involving security issues.

2.13. CORPORATE GOVERNANCE AND CAPITAL STRUCTURE

Corporate governance is a relatively recent phenomenon that gathered intense notoriety both at the corporate claimholders level and at the academic level.[296,297] However, this is hardly a new topic in corporate finance. As we saw earlier, a corporation may be seen as a legal fiction (served by network of contractual arrangements), or an *empty legal shell*, in Zingales 1998 parlance. In this view, the value of the corporation is contingent, among others factors, on the structure of ownership rights which are *ex ante* residual claims of the legal fiction on the underlying economic entity we call as the firm.[298] However, the unavoidable incompleteness of contracts does not eliminate the possibility of *ex post* disputes over those claims arising within contractual relationships established among claimholders of diffusely and publicly held firms.[299] These post contracting governance problems are potentially detrimental to claimholders' wealth.

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[296] As pointed out by Zingales (1998) although "some of the questions have been around since Berle and Means (1932), the term 'corporate governance' did not exist in the English language until twenty years ago." The awareness gathered by corporate governance during the recent decades is linked, at least partially, to major financial restructuring deals, takeover transactions and investors' activism.

[297] See the *Financial Economists Roundtable Statement on Institutional Investors and Corporate Governance* endorsed by prominent financial economists, such as, Franco Modigliani, Stewart Myers, William Sharpe, and Fred Weston. John and Senbet (1998) and Shleifer and Vishny (1997) provide two excellent and comprehensive surveys of the academic literature on corporate governance.

[298] By residual claims we refer to residual decision rights and allocation of residual returns.

[299] In this context, Zingales (1998) defines corporate governance as "the complex set of constraints that shape the ex-post bargaining over the quasi-rents generated by a firm."

This approach to the governance of contractual relations model clearly overlaps with the principal-agent model whose focus is the design of *ex ante* incentive-alignment contractual arrangements (e.g., Keasey, Thompson and Wright 1997; Williamson 1988). Further, Williamson suggests that *transaction-costs economics* should be viewed as complementary to *agency theory* in addressing corporate finance problems in general and capital structure in particular. He builds his argument on the fact that both theories share a common framework characterized by the features of managerial discretion and efficient contracting.[300] Concerning the contractual focus, *agency theory* directs its attention primarily to *ex ante* incentive-alignment point of view while TCE is more concerned with designing *ex post* governance structures within the contractual arrangement.

Using Williamson own words, "agency problems, as investigated under agency theories, seem to be the same as corporate governance problems, as investigated under transaction-cost economics." Thus, we assume that our discussion on the mechanisms to eradicate or lessen agency conflicts over capital structure play a parallel role in governance problems. In this sense, capital structure decisions can be conceptualized as a governance mechanism because they affect the process through which residual claims are allocated.[301] Capital structure decisions of a diffusely and publicly held firm may be seen as an internal corporate control mechanism because of the disciplinary role of leverage, bankruptcy and financial contracting.

A pure capital structure transaction, such as an equity-for-debt exchange offer, provides an insightful illustration of our argument. From the point of view of the agency theory, this type of transaction is a source of incentives for a better alignment between managers and shareholders' objective functions. Therefore, it is a helpful mechanism to reduce this kind of agency costs. On the other hand, in the governance perspective, such transaction is a mechanism that helps to lessen problems arising in residual claims allocation process. This becomes even clearer when we recognize that the allocation of

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[300] Consequently, "both work out of substantially identical behavioral assumptions" Williamson (1988, 570). The most noticeable differences between the agency theory and transaction-costs economics stem to a great extent from (1) the unit of analysis adopted by each one of the theories — the individual agent for the agency theory and the transaction for transaction-costs economics; and (2) the choice of the organization form. These two divergences are broadly explanatory of the incentive/governance dissimilarities between both theories.

[301] Other governance mechanisms include *inter alia* the allocation of ownership, managerial incentives, corporate control transactions, boards of directors' monitoring, shareholders activism (such as, block

ownership rights among inside and outside residual claimants is one of the determinants of corporate governance. Moreover, when corporate ownership gets increasingly separated from its control rights, the ineffectiveness of corporate governance structure leads to a greater likelihood of agency problems to arise. The wider the separation, the more likely are the agency problems to follow.

2.14. INPUT / PRODUCT MARKETS INTERACTIONS WITH FIRM'S CAPITAL STRUCTURE

Since the work of Hite (1977), later extended by Dotan and Ravid (1985), that financial economists have dedicated "a great deal of attention to the analysis of implications of firms' financial structure choices and their incentives to produce and invest" (Harris and Raviv 1991).[302] This attention seems justified because standard agency models typically are unable to handle the strategic interactions between the firm and its customers, suppliers and competitors, thereby we could be missing some implications of the capital structure choice.

This body of the capital structure theory developed, according to Maksimovic (1995) systematization, along four lines of thought. The first related to the influence of competitor investment decisions on the firm's capital structure and its implied incentives. The second based on the effects of capital structure strategic use on product market competition.[303] The third linked to the effects determined by changes in leverage on firms' incentives and industry equilibrium.[304] The fourth associated with the interplay of rivals with the agency conflicts arising in the firm's external financing activity. This setup provides a useful framework to assess (1) the value implications of the strategic interactions between capital structure decisions and product market behavior; and (2) the reactions of other product market participants to the financing choices of the firm.

The potential for strategic behavior in product market — such as collusion and predation — may determine, as pointed out by Ravid (1988) and Harris and Raviv (1991),

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shareholders and institutional investors), product-input market competition, and managerial labor market competition.

[302] Maksimovic (1995) provides a comprehensive and thoughtful survey of this literature. For two other excellent (although not as recent) reviews see Harris and Raviv (1991, 1988). Summaries of some relevant empirical papers are included in Appendix 2.1 to this chapter.

[303] It was shown that firms may have incentives to use their capital structures to commit to particular product market strategies. Brander and Lewis (1986, 1988) argue that debt financing commits firms to more aggressive output strategies. Other models find that leveraging helps to sustain higher equilibrium prices in product market competition (Schargrodsky 1997, Showalter 1995).

important consequences for capital structure. Brander and Lewis (1986), Maksimovic (1988) and Brander and Spencer 1989, among others, developed the pioneering theoretical work on this front, demonstrating that capital structure could be strategically chosen to influence the behavior of competitors in the industry.

Two relevant lines of inquiry developed in this literature: the *limited liability effect* and the *strategic bankruptcy effect*. The first is analyzed by, e.g., Brander and Lewis (1986) and Maksimovic (1988). It shows that the limited liability enjoyed by equityholders provides incentives to increase output because, *ceteris paribus*, this could raise profits and increase firm value. The second was studied by, e.g., Bolton and Scharfstein (1990) showing that more liquid and less leveraged competitors in an industry, may expand production and reduce prices to drive highly leveraged rivals into bankruptcy.

As discussed earlier in this chapter, Titman (1984) showed that the liquidation of a firm is costly for its customers and suppliers, such as the inability to obtain the product, parts, and/or service or the back out on previous implicit agreements. He claims that these costs are particularly relevant for customers of durable goods, and ultimately transferred to equityholders in the form of lower prices.[305] Titman shows that capital structure can be used to commit equityholders to an optimal liquidation policy.[306] Furthermore, Titman suggests that reputation (e.g., for being a reliable high quality service provider) is lost when the firm goes bankrupt. Therefore, one should expect, all other things being equal, that firms producing high quality products/services to be less leveraged.

Capital structure decisions may also affect the rivalry within an industry. Firms that aggressively compete for market share, by either lowering prices or increasing advertising expenses, are likely to trade-off lower earnings in the short-term for larger earnings in the long-term. Thus, competing for market share may be seen as a capital budgeting problem (e.g., Dasgupta and Titman 1995). In this framework, the incentive to gain market share will depend on discount rate, which is linked to capital structure (e.g, Clayton 1996).

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[304] In this context, it is accepted that leveraging up incentives requires the presence of strategic interaction. Because, monopolistic or perfectly competitive firms lack those incentives, the theory makes the prediction that oligopolies should be more highly leveraged compared to these firms (Schargrodsky 1997).

[305] Maksimovic and Titman (1991) show that producers of non-unique and non-durable goods may also be subject to a similar effect.

[306] Specifically, a firm will default only when the net gain of liquidation exceeds its cost to customers. It is shown that firm for which this effect is more important, e.g., banking and healthcare should be less leveraged, *ceteris paribus*, than firms for which this effect is less important, e.g., hotels and supermarkets.

Financial leverage can also be strategically used to strengthen the contracting power of the firm in dealing with its input suppliers. Therefore, it may be predicted that, *ceteris paribus*, highly unionized firms and/or employing workers with highly transferable skills will be more highly leveraged (Sarig 1988).

It has been suggested that more leveraged firms in an industry, on average, charge higher prices. However, has shown by Dasgupta and Titman (1998) that might not be always the case, notably, when the firm's competitor is relatively unleveraged. Moreover, because of its valuation implications, capital structure decisions also determine significant consequences for the prices under the jurisdiction of regulators, as it is the case of public utility firms (Spiegel and Spulber 1994).

It is widely accepted that product market structure and the type of competitive interaction across firms are industry specific. Thus, to the extent that the effect of capital structure decisions on firm to enter into implicit contracts with rivals (Maksimovic 1988) or to maintain reputation (Maksimovic and Titman 1990) is also firm specific, then capital structures should vary systematically intra- and inter-industry.

CONCLUDING REMARKS

As previously noted, with this discussion of the capital structure theory we aimed primarily to put in perspective some of the theoretical foundations that contribute to shed light on the firm's strategic financing decisions. Nonetheless the extension of this literature, we still lack a comprehensive and empirically confirmed theory.[307] One of the unsatisfactory aspects of the theory is its inability to handle the capital structure decisions of financial intermediaries, such as banking firms. As we described in Chapter 1, the empirical part of this dissertation includes an examination of the Portuguese Bank CEOs' capital structure decisions. In Chapter 3 we develop the theoretical framework that enabled the formulation of testable hypotheses to structure the survey questionnaire.■

[307] Appendix 2.1 to this chapter includes a summary of relevant capital structure empirical literature.

Appendix 2.1

Summary of Empirical Literature on Capital Structure

Harris and Raviv's (1991, 297), cautionary note "we simply take the empirical results at face value and do not review or criticize the methods used in these papers" also applies to the following table. Thus, we are unable in building this summary to account for the unavoidable differences arising from, e.g., accounting principles and practices, market structures, and legal frameworks. These differences do interfere with methodological choices and are a source of technical problems, such as, identification, measurement, and results interpretation. Harris and Raviv (1991) and Masulis (1988) provide two excellent survey of capital structure empirical literature.

Study	Sample Description	Main Findings
Tests of M-M's Irrelevance Proposition		
Miller and Modigliani (1966)	1947-1948 data of a sample of U.S. electric utilities and oil companies	Failed to find statistical significance in their regression and therefore were unable to reject the null hypothesis that the weighted average cost of capital is unrelated to capital structure.
Smirlock and Marshall (1983)	Annual data on dividends and investment of a sample of U.S. 194 firms, from 1958 to 1977	Performed Granger causality testing of the M-M irrelevance hypothesis. Failed to reject the null hypothesis that no Granger causality existed for the aggregate sample of firms.
Mougoue and Mukherjee (1994)		Granger causality testing of the M-M irrelevance hypothesis. Inverse (Granger) causality between dividend and investment growth rates is shown, as well as a positive causality between long-term debt and investment growth rates, and between debt and dividends. Conclude for the rejection of the M-M irrelevance hypothesis
Fazzari, Hubbard and Petersen (1988)	Large panel of Value Line data for U.S. manufacturing firms two-digit SIC codes between 20 and 39, inclusive.	Look at the choice between internal and external financing in U.S., showing that investment of firms that firstly exhaust their internal financing are more sensitive to fluctuations in cash flow than mature firms with less availability of that particular type of financing (perhaps due to higher dividend payout ratios policies). Further evidence is provided suggesting that the influence of firm's financing policy on firm's investment is positively correlated with the severity of capital markets' informational problems. Concludes for the Interdependence between investment and financing policies.
Patterns, Regularities and Determinants of Capital Structure		
Aswath Damoradan (1999a)	Value Line sample of 5792 U.S. firms (data used is as of June 30, 1999).	Average debt ratio of 19.8 percent (market value), and 51.3 percent (book value).
Wiwattanakantang (1999)	Cross-sectional data for non-financial Thai listed firms.	Firms' profitability, asset tangibility, taxes, growth and governance are found to be significant factors in capital structure choice of Thai firms. Managerial ownership holdings have no significant effect on debt-equity choices.
Hackethal and Schmidt (1999)	Flow-of-funds data from official statistics of Germany, Japan and U.S. for the 1970-1996 period.	There are significant differences in relative importance of external and internal financing in the three countries. Empirical results are in contrast with prior studies (e.g., Mayer 1988). Differences are attributed to methodology.
Wald, John (1999)	Sample of 4.404 non-utility non-financial firms, which 313 French, 316 German, 1,350 Japanese, 1,096 U.K., and 1,329 U.S. The analysis focuses on either1991 or 1992.	Found patterns of similar leverage across countries what is consistent with Rajan and Zingales (1995). Variables associated with moral hazard, tax deductions, R&D, and profitability, exhibit the expected signs and are consistent across countries, other variables, such as those associated with risk, growth, firm size, and inventories, show different effects in different countries. This result indicates that institutions may be significant determinants of capital structure, and that agency and monitoring problems, while existing in every country, may create different outcomes.
Liu (1999)	Chinese listed firms during the 1992-1997 period.	Industry is a discriminating factor. Firm and tangible asset-base size are positively related to financial leverage. Profitability and asset' growth rates are inversely related to tangible asset-bases. According to the author the evidence does not confirm the importance of ownership structure for the debt-equity choice of sampled firms.
Chen, Lensink, and Sterken's (1998)	Panel data of 51 Dutch firms from 1984 through 1995.	Support for the pecking order model. Agency costs and corporate control considerations appear to be relatively unimportant.
Barry (1997)	U.S. firms with four-digit SIC codes between 2000 thorough 3990 during the 1977-1993 period.	Found support for the hypothesis that industry-related factors determine target debt ratios. Furthermore, industry average debt ratio would be a suitable surrogate for a target capital structure. Very strong support for the pecking order theory for firms increasing and decreasing leverage, is reported.
Delbreil et al. (1997)	Austrian, French, Italian, German, and Spanish manufacturing companies during the 1991-1993 period.	The impact of corporate size varies widely from country to country. There are greater variations between the small companies of the different countries than between the very large companies. The above findings do not appear to be related to the industry composition of each sample. Capital structure of firms in these countries is differentiated no matter the measure used.
Hussain and Nivorozhkin (1997)	Panel data of firms listed on The Warsaw Stock Exchange (Poland) during the 1991-1994 period.	The authors report that firms in the sample exhibit "extremely low leverage levels." Ownership structure is found to be a factor in explaining financial leverage. It is also reported that large, newly incorporated, and foreign-owned firms, as well as firms holding strong cash reserves or exercising high earnings retention rates are more highly leveraged.
Berger, Ofek and Yermack (1997)	Sample of 434 non-financial and non-utilities U.S. firms in the 1984-1991 period	Average financial leverage of 24.7 percent and 26.5 percent, in terms of book value and market value, respectively. See also Marsh (1982), and Schwartz and Aronson (1967).
Augusto (1996)	Sample of Portuguese manufacturing firms draw from Banco de Portugal database.	Reports support for the hypothesis of firm's historical profitability explaining actual financing structure. Results are consistent with the hypothesis of existence of a size effect in the debt maturity structure choice.
Saá-Requejo (1996)	Sample of 82 Spanish listed firms. Data drawn from the "Central de Balances del Banco de España" database for the period December 1984 thorough December 1988.	The evidence suggests that for Spanish firms besides the debt-equity choice the private or public nature of external financing is a relevant consideration in capital structure policy. Results are consistent with MacKie-Mason (1990b).
Requejo and Rodriguez (1996)	Panel data of non-financial firms listed at Madrid (Spain) Stock Exchange during the 1990-1993 period.	Results provide support for the agency hypothesis and contradict signaling and tax propositions.

Cornelli, Portes, and Schaffer (1996)	Hungarian and Polish non-financial firms at the end of 1992, and for a sample of Czech non-financial firms at the end of 1994.	For the former sample, the average debt ratio (book value) is 32% and 41% for Hungary and Poland respectively. For the latter sample the ratio is 44%.
Barclay, Smith, and Watts (1995)	6780 industrial firms included in the Compustat database between 1963 and 1993.	Report that investment opportunities seem to be the most important determinant of financial leverage. Effects of regulation were also found significant. No support was found for the tax and the signaling hypotheses.
Shabou (1995)	Panel of both quantitative and qualitative data for 104 Tunisian firms during the 1974-1988 period.	Ownership structure is an important determinant of leverage. Found support for Leland and Pyle (1977) signaling hypothesis.
Rajan and Zingales (1995)	Sample of firms from the G-7 countries,	Firms' financial leverage, at aggregate level, across the G-7 countries is fairly similar. Sample firms in German and in the U.K. appear to be less leveraged than firms in other countries. Differences in accounting principles and practices may explain some of the variance in leverage, but to level playing field seemed problematic.
Singh (1995)	Extends Singh and Hamid (1992) by using a larger panel data of larger firms and longer time series. The study examines accounting data: Brazil, India, Jordan, Republic of Korea, Malaysia, Mexico, Pakistan, Thailand, Turkey and Zimbabwe.	A central conclusion of this report is the finding that capital structures in those developing countries differ in important ways from the capital structures of firms in developed countries. These differences are particularly marked with respect to the use of external finance and the use of equity finance; both of which are much higher in developing than in developed countries.[i]
Demirgüç-Kunt and Maksimovic (1994)	800 firms of ten developing countries during the 1980s.	Capital structure determinants of U.S. firms appear to be similar to the ten countries included in the sample. More profitable firms and that are making large payouts to owners firms are less leveraged, what is consistent with Michael Jensen's free cash flow hypothesis
Chaplinsky and Niehaus (1993)	Sample of 286 U.S. firms with data taken from Fortune 500 Corporate Data Exchange (CDE), Value Line Investment Survey, COMPUSTAT and CRSP files.	Strong inverse relationship between leverage and free cash flow. This finding is inconsistent with Jensen's (1986) free cash flow hypothesis, but supportive of Myers' (1984) pecking order hypothesis. Further, they report weak support for the hypothesis that leverage and insiders' ownership are conjointly explained. This finding is consistent with Jensen, Solberg and Zorn (1992), and Holthausen and Larcker (1991), but contradicts Crutchley and Hansen (1989).
Thies and Klock (1992)	Large U.S. manufacturing firms from 1935-1941 through 1977-1983.	Taxes, bankruptcy, agency and information costs are recognized as influencing capital structure. Leverage ratios and debt policy both vary across time and firms.
Singh and Hamid (1992)	Large corporations accounting and market data from: India, South Korea, Pakistan, Jordan, Thailand, Mexico, Malaysia, Turkey and Zimbabwe.	Capital structures in those developing countries differ in important ways from the capital structures of firms in developed countries. Differences relate to the use of external finance and equity. Both are much higher in developing than in developed countries.
Allen and Mizuno (1989)	Sample of 125 Japanese industrial and commercial companies from 14 different industries for the period 1980-1983.	Results suggest that profitability and industry factors play an important part in the determination of Japanese company capital structures. However, the influence of the theoretical variables on Japanese company capital structure is not clear cut at all.
Bernanke and Campbell (1988)	U.S. data	Moderately low debt ratios (20 - 30%) are prevailing for the most part of the XX century. See also Wall (1988), Taggart (1985), and Gordon and Malkiel (1981).
Titman and Wessels (1988)	Data from the Annual Compustat Industrial Files from 1974 to 1982. The quit-rate data are from the U.S. Department of Labor, Bureau of Labor Statistics.	Document an inverse relation between financial leverage and the "uniqueness" of a firm's line of business. Evidence suggests that transaction costs may be important factor in the determination of capital structure. Short-term debt ratios appear to be negatively related to firm size, arguably, because of the presence of economies of scale in long-term financing. Findings do not provide support for hypothesized relations between leverage and non-debt tax shields, volatility, collateral value, or future growth.
Friend and Hasbrouk (1988)	Non-financial, non-utility U.S. firms possessing financial statements through l983. Primary sources of data were the Compustat database and SEC filings.	Documents a relationship between insider holdings and capital structure. Additionally, found no correlation between dividend payouts and the size of insider holdings.
Titman and Wessels (1988)		Intra-industry it appears that leverage is inversely related with profitability, and asset-intensiveness. See also Long and Malitz (1985, and Bradley, Jarrell and Kim (1984), among others, for similar empirical results.
Michel and Shaked (1985)	Matched sample of 130 Japanese and 130 U.S. firms, belonging to ten different industries.	Results suggest that the Japanese firms are more highly leveraged than the U.S. firms.
Bradley, Jarrell and Kim (1984)		Debt ratio is (1) inversely related to the volatility of operating earnings; (2) positively related to the level of non-debt tax shields; (3) negatively related to the advertising and R&D expenses used as surrogates for agency costs. Overall they document asset structure, liquidity, and industry classification show the stronger explanatory power of the determinants of capital structure. Size, growth opportunities and income tax consideration follow. Capital structures across countries show an industry effect. Found evidence of little intra-industry variability of debt ratios
Sarathy and Chatterjee (1984)	1979 accounting data of 368 U.S. and 573 Japanese large firms.	Results show that Japanese firms in the sample have significantly lower equity-to-assets ratios compared to U.S. sample firms.
Bowen, Daley and Huber (1982)	Data selected from the Compustat Annual Industrial files from 1951 through l969.	Firms exhibit a statistically significant tendency to move toward their industry mean over both five and ten year time periods. Industry average debt ratios tend to remain stable. Furthermore, provide evidence supporting DeAngelo and Masulis' (1980) proposition III that non-debt tax shields are an important consideration in the determination of the optimal level of debt in the capital structure.
March (1982)	Sample of 748 issues made by UK listed firms between 1959 and 1970.	Firms' pattern of financing behavior seem to de determined by, both, a target long-term debt ratio and a target ratio of short-term to total debt

Taxation and Capital Structure Choice

Graham (1999a)	U.S. sample data from Compustat (1973-1994 period) and state tax information from Fiscal Federalism (1981–1995).	Documents that the present value the benefit of tax interest deductibility is approximately 10 percent of firm value, decreasing to 4.3 percent when income tax at the personal level is accounted for. If firms were to lever up to the point where their interest-deduction benefit functions first become downward sloping, they would obtain additional gross tax benefits equal to about 15% of firm value. These results suggest

		that either the expected costs of incremental leverage are quite large, or else that firms use debt too conservatively.
Graham (1999b)	U.S. sample data from Compustat (1973-1994 period) and state tax information from Fiscal Federalism (1981–1995).	Used simulated marginal tax rates to account for uncertainty of, e.g., taxable income and tax-loss carrybacks and carryforwards. Cross-sectional regressions show, controlling for personal taxes, that financial leverage is positively correlated with tax rates in each year 1980-1994, with significant coefficients in almost every year. Results contradict Miller's (1977) tax hypothesis. Evidence suggests that income tax at the personal level reduces, but does not eliminate the incentives for debt financing.
Gordon and Lee (1999)	U.S. Statistics of Income (SOI) Corporate Returns, SOI Individual Returns from 1950 through 1995.	Findings are consistent with the hypothesis that corporate income taxes provide a strong and significant effect on financial leverage. Tax incentives appear to vary according to actual or future tax losses. The results also indicate that small firms' reliance on debt financing is higher than in the case of large firms. Corporate tax rates differentiate across firm size. Given the current levels of these rates the U.S. for large and small firms, the authors estimate that the former group of firms could increase their debt ratio by 8 percentage points.
Lie and Lie (1999)	Samples of 213 self-tender offers and 433 special dividends announced in U.S. from 1991 to 1994; 987 open market repurchases and 5590 regular dividend increases announced in U.S. from 1980 to 1990.	Examine the impact of personal taxation on the managerial choice between share repurchases and dividends as means returning cash to investors. Findings indicate that that managers are more likely to choose a share repurchase if the firm has a low dividend yield, if the firm's stock has experienced losses or small recent capital gains, and if the payout occurred before the Tax Reform Act of 1986. Results are consistent with the notion that personal taxation influences the choice of disbursement method,.
Gropp (1997)	Sample of 929 U.S. manufacturing firms listed at the NYSE and AMEX with data available on Compustat files from 1979 to 1991.	Documents a strong and statistically significant positive relation between expected effective tax rates and financial leverage. Some support is reported for agency and for bankruptcy costs explanations of capital structure choice. The evidence is considered inconsistent with the signaling hypothesis.
Cloyd, Limberg and Robinson (1997)	Sample of closely held corporations derived from the Board of Governors of the Federal Reserve System 1988-89 National Survey of Small Business Finances.	Tested tax and tax substitution hypotheses. Regression results provide support to both hypotheses. a significant positive relationship between tax rates and leverage is found. Evidence is consistent with the proposition that taxes, at both the individual and the corporate level, significantly influence capital structure decisions.
Shih (1996)	U.S. Internal Revenue Service corporate tax return annual data from 1950 to 1989.	Provides evidence supporting the proposition that the risk of tax exhaustion is negatively related to firms' financial leverage. Additionally, reports that was found evidence suggesting that income tax at personal level is likely to affect firm leverage.
Davis (1994)	Sample of 250 non-financial Canadian firms with data from 1966 to 185 available on Compustat.	Provides an empirical examination of the three competing versions of the substitution hypothesis (inverse relationship between debt and non-debt tax-shields). In general, results do not support DeAngelo and Masulis (1980) and Dotan and Ravid (1985). Versions of the proposition. Some support is documented, however, for Dammon and Senbet's (1988) substitution hypothesis.
Givoly *et al*. (1992)	Sample of 995, 892, 873 and 860 U.S. firms for 1987, 1986, 1985, and 1984 respectively. Data from Compustat.	Tested the tax hypothesis around the Tax Reform Act of 1986. Findings suggest that corporate taxes and non-debt tax shelters both are influential for capital structure decisions. Additionally, report that indirect evidence supporting the proposition that income taxes at the personal level also affect capital structure choice.
Dhaliwal, Trezevant and Wang (1992),	Sample of 1,045 U.S. firms with data available for the period 1972-1986 from Compustat.	Report empirical support for the substitution hypothesis (DeAngelo and Masulis 1980) and the tax exhaustion hypothesis (MacKie-Mason 1990a).
MacKie-Mason (1990a)	Sample of 1747 registrations of public seasoned security offerings made by U.S. firms since 1977. Data from Compustat.	Finds "clear and substantial" tax effects on financing choices. Evidence suggests should consider looking to incremental financing decisions, rather than to aggregate leverage ratios. Taxes influence capital structure although not in decisive manner. Firms with tax loss carry forwards are less likely to issue debt.

Financial Distress and Bankruptcy Issues

Andrade and Kaplan (1998)	Sample of 31 firms that went through highly leveraged transactions (HLT) and became financially distressed. Data covers the period from the time of the HLT transaction to the resolution of financial distress.	Provides a 10 percent estimate for the costs of financial distress (with an upper bound of 23 percent). Selection bias, however, may have contaminated the evidence if sample firms with low costs of financial distress are more likely to be highly leveraged.
Campbell (1997)	Data from 36 closely held firms that successfully completed the Chapter 11 process.	Direct bankruptcy costs were estimated, on average, at 8.5 percent of book value of total assets at the bankruptcy filing date, therefore supporting the non-triviality of those costs. It is also reported the presence of significant scale economies in bankruptcy costs.
Alderson and Betker (1995)	Sample of 88 U.S. firms drawn from firms that completed Chapter 11 bankruptcies during the 1982-1993 period.	Firms bearing higher liquidation costs emerge from Chapter 11 with relatively low debt ratios. Further, these firms' debt is more likely to be public and unsecured and having less restrictive covenants. These firms are also likely to raise new external equity capital. Authors conclude that high liquidation costs drive firms to adopt capital structures that make financial distress less likely.
Weiss (1990)	Bankruptcy filings made between 1979 and 1986 by 37 U.S. listed industrial firms.	Reports that direct costs of bankruptcy in his sample of industrial firms averaged 3.1 percent of the total assets value in the fiscal year-end prior to bankruptcy, and that the average time spent in Chapter 11 was 2.5 years. No evidence supporting the returns to scale hypothesis was found.
Litzenberger (1986)	Sample of U.S. oil companies	Found a negative effect on the market value of extensive changes in capital structure. Additionally, the evidence supports the hypothesis that bankruptcy costs are substantial and affect firms' capital structure decisions.
Altman (1984)	Data of bankruptcy reorganization filings (antedating the implementation of the Bankruptcy Code) of 12 retail firms, and seven industrial firms.	Direct bankruptcy costs for the retailer sample was, 2.8 percent (1.4% for Warner 1977) five years prior to bankruptcy filling, and 4.0 percent (5.3% for Warner 1977) just prior bankruptcy. For the industrial sample, was 6.0 percent (1.4% for Warner 1977) five years prior to bankruptcy filling, and 6.0 percent (5.3% for Warner 1977) just prior bankruptcy. For the sample of retail firms estimated direct bankruptcy costs were, on average, 4 percent of firms' value in the year of bankruptcy. For the sample of industrial firms these costs were, on average, to 9.8 percent of firm value in the year of bankruptcy. Evidence is consistent with Warner (1977) argument of a scale effect in direct bankruptcy costs.

Warner (1977)[ii]	Data of 11 railroads that were in bankruptcy reorganization proceedings between 1933 and 1955.	Found that direct bankruptcy costs averaged 1.4 percent five years prior filling for bankruptcy, rising to 5.3 percent of the firm's value in the year of bankruptcy. Estimated bankruptcy costs were estimated at 9.1 and 6.6 percent for the two smallest firms in the sample and at 2.7 and 1.7 percent for the two largest. Thus, direct bankruptcy costs were characterized as a concave function of firm size suggesting the presence of economies of scale. In face of the results, the importance of bankruptcy costs as a determinant of capital structure might be overstated.

Agency and Governance Problems

Ang, Cole and Lin (2000)	Sample of 1708 small corporations from the Federal Reserve Board /National Survey of Small Business Finances database.	Found evidence supporting several predictions of agency cost theory. Agency costs are found to be: i) significantly higher when an outsider rather than an insider manages the firm; ii) inversely related to the manager's ownership share; iii) increasing with the number of non-manager shareholders, and iv) to a lesser extent, lower with greater monitoring by banks.
Parrino and Weisbach (1999)	Data to calibrate simulation models were collected from Standard and Poor's Compustat database far all years in the 1981-1995 period. Others data sources were Ibbotson and Associates databases.	Used numerical methods to examine the importance and magnitude of agency costs of stockholder-bondholder conflicts in capital-structure choice.
Roth and Saporoschenko (1999)	Sample of 142 large managerial purchase announcements from 139 firms for each week of the 1993- 1995 period. Announcements were identified in the Wall Street Journal's weekly ITS column (lists by market value the ten largest insider purchases). Return data from the Center for Research in Securities Prices (CRSP).	Look at investors' reactions to large insider stock purchases. Findings suggest that investors react positively to announcements of large purchases by firm managers. This result is consistent with Leland and Pyle´s (1977) hypothesis that insiders increasing their ownership holdings as a reducing effect on the informational asymmetry between insiders and outsiders.
Nohel and Tarhan (1998)	The sample, drawn from a wide variety of industries, includes 48 tender offer stock repurchase announcements from 1978 and 1979, 122 announcements from 1980 to 1987, and 72 announcements after 1987. Data from COMPUSTAT and CRSP.	Provide evidence in support of the free cash flow explanation of investor positive reaction to share repurchases. Additionally, the authors claim that find supporting evidence that "repurchases do not appear to be pure financial transactions meant to change the firm's capital structure but are part of a restructuring package meant to shrink the assets of the firm."
Stephens and Weisbach (1998)	Sample of 450 (370) open-market share repurchase programs announced in *The Wall Street Journal Index* during 1981 to 1990.	Examines the signaling effects of share repurchases. Report an average abnormal return of 2.69 percent on the announcement of an open-market share repurchase program (over a three-day event window starting the day prior to announcement). Found that open-market share repurchase program announcements are inversely related to prior stock price performance. This result suggests that firms repurchasing activity depends on the degree of perceived stock price undervaluation.
Fen and Liang (1997)	Panel data of all non-financial firms on Compustat during 1984 1995 period, with total assets greater than 50 million (1994) dollars.	Consistent with the hypothesis that firms use open market repurchases to reduce the agency costs of free cash flow, we find that repurchases are positively related to proxies for free cash flow and negatively related to proxies for marginal financing costs.
Berger, Ofek and Yermack (1997)	Data from a sample of 452 industrial firms between 1984 and 1991. The panel was drawn from annual Forbes magazine rankings of the 500 largest U.S. public corporations.	Document cross-sectional relationships between various corporate governance variables and debt-to-equity ratios. The evidence provide strong support for the argument that firm's observed capital structures are influence by managerial entrenchment. Significantly lower leverage is documented when: (1) managerial entrenchment is present; and (2) CEOs do not appear to face strong monitoring. It is reported that capital structures experienced significant leveraging up after events that represent negative a shock to managers' security, such as a takeover threat. Consistent with the disciplinary role of managerial compensation is documented a positive relationship between increases in stock option holdings and leverage.
Denis, Denis and Sarin (1997)	Sample of 933 non-regulated utilities and non-financial firms selected in with data available on COMPUSTAT for the 1985 fiscal year.	Document a strong and inverse relationship between the extent of firm diversification and managerial equity ownership.
Safieddine and Titman (1997)	Sample of 207 of 315 targets that remained independent for, at least, one year after the initial termination date.	The median level of total debt scaled by the book value of assets with a one-year lag, of the unsuccessful takeover attempt is 59.8 percent, increasing, on average, to 71.5 percent on year afterward.
Fenn and Liang (1997)	Panel data set of all U.S. non-financial firms on Compustat during 1984-95 with total assets greater than 50 million (in 1994 dollars).	Document a positive relationship between share repurchases and (proxies) for free cash flow and an inverse relation between share repurchases and (proxies) for marginal financing costs. Results are consistent with the hypothesis that firms use open market share repurchases to reduce the agency costs of free cash flow. Signaling is ruled out as a possible motivation for making open market share repurchases. Comparing our cross-sectional regression results for repurchases with those obtained for dividend increases, we conclude that the latter likely are not motivated primarily by the agency costs of free cash flow and that firms generally do not treat repurchases and dividends as close substitutes. Report evidence in support of the hypothesis that managerial stock option holdings are related to the substitution of share repurchases for dividends payments.
Ikenberry, Lakonishok and Vermaelen (1995)	Sample of 1239 open-market share repurchases announced from January 1980 to December 1990.	Similarly to earlier empirical studies, report a 3.5 percent average market reaction to the announcement of an open-market share repurchase. This result is viewed as inconsistent with managerial arguments of undervaluation to engage in repurchase transactions. Average market underreaction to open-market share repurchase is estimated at 15 percent when announcement and four-year abnormal returns are combined. Further evidence suggests that the full impact of announcements can extend for several years.
Lasfer (1995)	Non-financial companies which have their accounting data available for the1972-l983 time period in Exstat, Extel Cards and Datastream.	Firms with few growth options have more long-term debt in their capital structure. Low free cash flow problems are associated with reduced level of debt in capital structures. Results suggest that debt potentially play a role in lessening manager-shareholder conflicts.

Asymmetric Information Factors on Capital Structure		
Spiess and Affleck-Graves (1999)	Straight and convertible debt offerings by non-regulated utilities or financial institutions included in *Investment Dealers' Digest Directory of Corporate Financing* during the 1975-1989 period.	Report substantial long-run post-issue underperformance by firms making straight and convertible debt offerings from 1975 to 1989. This long-run underperformance is more severe for smaller, younger, and NASDAQ-listed firms, and for firms issuing speculative grade debt. Strong evidence that the underperformance of issuer of both straight and convertible debt is limited to those issues that occur in periods with a high volume of issues is also found. Results are consistent with the idea that debt offerings (like equity offerings) may signal firm overvaluation.
McLaughlin, Safieddine, and Vasudevan (1998)	Sample of 1,967 equity offerings and 960 debt offerings of U.S. firms during the period 1980-1993 with data available in the Securities Data Company database.	Findings are consistent with the asymmetric information hypotheses. Results show that the greater the information asymmetries the more pronounced the decline in operating performance. Issuing firms with higher market-to-book ratios and smaller size, experienced larger post offering performance declines.
Tsangarakis (1996)	Common stock rights offerings by firms listed in the Athens Stock Exchange during the 1981-1990 period.	Examines stock price reaction to rights offerings. Documents positive abnormal stock returns on the announcement day of rights offerings in Greece. Furthermore, abnormal returns are found to be inversely related to the level of stock ownership diffusion. Evidence suggests that rights offerings in Greece convey positive information about future prospects of issuers.
Shah (1994)	175 leverage-increasing and 191 leverage-decreasing transactions, both occurring during the period 1970-1988.	Examines the nature of information conveyed by financial leverage changes. The information conveyed by the announcement of these by pure capital structure changes is qualitatively different for leverage-increasing and leverage-decreasing offers. His results suggest that the two types of offers reveal qualitative differential information about firms' performance.
Denis, Denis and Sarin (1994)	Sample of 6,777 large dividend changes (5,992 dividend increases and 785 dividend decreases) over the period 1962-1988. Data from COMPUSTAT, National Bureau of Economic Research (NBER), Wall Street Journal Index and CRSP.	Report that their findings are supportive of the cash flow signaling and dividend clientele hypotheses but inconsistent with the overinvestment hypothesis.
Dierkens (1991)	Seasoned primary equity offerings made by U.S. industrial firms during the 1980-1983 period and reported in the *Investment Dealers' Digest Directory of Corporate Financing*.	Provides cross-sectional evidence of a significant positive relation of asymmetric information increases at stock price decline at the announcement date of equity issue. Timing tests suggest that firms time the announcement of their equity offerings when information asymmetries are relatively low.
Korajczyk, Lucas and McDonald (1990)	Firms listed on the New York Stock Exchange (NYSE) and on the American Exchange (AMEX). Firms with shares trade over-the-counter (OTC) were also included.	Common stock price reactions adjusted for general market price changes (abnormal returns) in the 500 days preceding and 100 days following the issue announcement for primary issues and mixed primary and secondary issues (i.e. equity issues that add no capital to the firm). Empirical evidence shows: (1) In the 500 days prior to the equity issue announcement NYSE/AMEX firms exhibit an overall 43.8 percent abnormal return (for primary and combined primary and secondary issues) and a 29.3 percent abnormal return for secondary issues. Corresponding abnormal returns for OTC firms are 68.8 percent and 44.5 percent, respectively. (2) The overall abnormal return on the two days on and preceding the equity issue announcement is –3.0 percent for NYSE / AMEX firms and – 2.8 percent for OTC firms. Abnormal return for secondary issues is –2.8 percent for NYSE / AMEX firms and – 1.7 percent for OTC firms. (3) The pattern of price behavior is generally similar for pure secondary and other issues, though primary issues announcements are preceded by a larger price run-up. (4) OTC and for NYSE / AMEX firms also have qualitatively similar stock price patterns, with a larger rise for OTC firms. (5) Equity issues follow rises in the market as a whole. These results are consistently and significantly confirmatory of the findings reported in earlier surveys of this literature (e.g., Smith 1986; Masulis 1988; and Harris and Raviv 1991).
Smith 1986	Summarizes studies of Asquith and Mullins (1986), Kolodny and Suhker (1985), Masulis and Korwar (1986), Mikkelson and Partch (1986), and Schipper and Smith (1986).	Two-day common stock price reactions adjusted for general market price changes (abnormal returns) to announcements of public issues of common stock, preferred stock, convertible preferred stock, straight debt and convertible debt by industrial and utility firms.Reports an average (weighted by sample size) -3.14 percent abnormal return in two-day following the announcement of common stock issues. Four generalizations are suggested: (1) the average abnormal are non-positive; (2) abnormal returns associated with announcements of common stock sales are negative and larger in absolute value than those observed with preferred stock or debt; (3) abnormal returns associated with announcements of convertible securities are negative and larger in absolute value than those for corresponding non-convertible securities; and (4) abnormal returns associated with sales of securities by industrials are negative and larger in absolute value than those for utilities.
Kim and Sorensen (1986)	Sample of 168 U.S. firms divided in two subsamples of 84 firms each: insider-owned firms and outsider-owned firms, with 43 percent and 2 percent of insider ownership respectively.	Study the presence of the agency costs and their relation to the debt policy. Document that firms with higher insider ownership show greater debt ratios than firms with lower insider ownership. Evidence is explained by the presence of agency costs of debt and equity. Further, evidence support the argument that high-growth firms tend to be less leveraged than low-growth firms, and high-operating-risk firms tend to be more leveraged than low-operating-risk firms. Finally, firm size does not show a statistically significant correlation with financial leverage.
Capital Structure and Product Markets Interactions		
Showalter (1999)	Sample of 1641 U.S. manufacturing firms that in 1994 were operating for at least 11 years. Data from COMPUSTAT Annual Reports over the period 1975 to 1994.	Documents that "manufacturing firms increase debt as demand uncertainty grows, but reduce debt as costs become more uncertain." Evidence is consistent with the hypothesis that financial leverage may be used as a strategic device in price competition.
Schargrodsky (1997)	Sample of 21 firms from the U.S. newspaper industry from 1964 to 1995.	Results show that financial leverage is reduced as the extent of competition (i.e. the degree of strategic interaction) falls. The effects are statistically and economically significant.
Chevalier (1995a, b)	Sample of 3 U.S. supermarket leverage	Findings suggest that when supermarkets increase leverage, investment decreases and

	buyouts (Safeway, Supermarkets General, and Stop & Shop) and 1 leveraged recapitalization (Kroger).	prices rise. High leverage seems to be perceived as detrimental to competitiveness. It is also suggested that less leveraged firms were more likely to fight for market share than the more highly leveraged LBO firms. This might be explained because cash constrained LBO firms need to charge higher prices than their more capitalized rivals.
Kovenock and Phillips (1995)	Sample includes 40 leveraged buyouts, management buyouts and public recapitalizations of U.S. firms. Data from 10 commodity industries during1979-1990 period.	Find that when industry concentration is high, firms which recapitalize are less likely to invest and more likely to close plants.
Phillips (1995)	Fiberglass, tractor-trailer, polyethylene, and gypsum industries.	Evidence supports the proposition that capital structure is influenced by product market decisions at the industry level. In three industries financial leverage is inversely related with output. Low financial leverage of rivals and low relatively low barriers to entry might explain the positive relationship found in the other industry between leverage and output. Found that in three out of four industries, as leverage increases, investment decreases and industry prices increase.
Guedes and Opler (1994)	Panel of U.S. firms biannual data during the 1981-1989 period from COMPUSTAT and TRINET databases.	No evidence was found in support of the hypothesis that firms' strategic behavior in product markets is cross-sectionally related to financial leverage. Weak evidence is also reported that intra-industry the determinants of leverage differ when the potential for strategic interaction is high. Financing decisions at the margin are affected by the degree of industry concentration, however the effect is economically insignificant.
Denis (1990)	Defensive payout announcements (49) mentioned in Wall Street Journal Index under the headings "Mergers and Acquisitions" or "Reacquired Shares" from 1980 to 1987.	Reports average negative announcement of defensive share repurchases is associated with an average negative impact on the share price of the target firm. In contrast dividend payments generally increase the wealth of target firm shareholders.
Spence (1985)	Sample of 1,183 U.S. firms. Product market data are from 1972. Financial data are 5-year averages for 1970-1974.	Report very little evidence that deviations of observed from calculated optimal capital structure (industry mean debt ratio) are affected by product market considerations. *Ceteris paribus*, diversified firms tend to be more leveraged and large (as measured by assets) and labor-intensive firms less. Capital structure appears to be related to product market attributes, competitive conditions or firm's financial situation.

Pecking Order Hypothesis

Shyam-Sunder and Myers (1999)	Sample of 157 non-regulated utilities non-financial firms with that available in COMPUSTAT database from 1971 through 1989.	uses a simulation methodology to test the pecking order versus the static tradeoff theory finding strong support for the pecking order theory and, consequently, rejecting the target capital structure theory. This is consistent with Myers' (1993) argument that the pecking order theory is predictively superior to the static tradeoff theory.
Ghosh and Cai (1999)	256 manufacturing firms belonging to Fortune 500s during the 1974-1992 period.	Found that capital structure measures show strong reversion to the industry means. Found also strong support for the pecking order hypothesis and that for its coexistence with the optimal capital structure hypothesis.
Helwege and Liang (1996)	Data on the IPO security offerings of 367 U.S. firms with financial data available from Compustat or Compact Disclose during the 1983-1992 period.	Results do not support the hypothesis that firms follow a pecking order of financing once that greater asymmetries of information do not lead to a higher probability of debt issuance.
Klein and Brian (1994)	All non-financial, non-regulated industrial firms listed on the Compustat database for the 1983-1988 period.	Firm size and sales growth rate important determinants of financing choice. These results are seen as supportive of the pecking order hypothesis
Jensen, Solberg and Zorn (1992)	Sample of 565 firms with data available on COMPUSTAT database and listed in the Value Line Investment Survey in 1982 and 1987. Regulated utilities and financial firms were excluded from the sample.	Document that profitability, growth, and investment spending are related to debt and dividend policies. Results are consistent with the pecking order theory. Furthermore, is reported evidence consistent with the hypothesis that financial decisions and the level of insider ownership are interdependent.
Baskin (1989)	378 surviving (still available on Compustat in 1984) firms from the 1960 Fortune 500s with data covering the 1960-1972 period.	Document strong support for the pecking order theory suggesting that capital structure in practice tend to respond passively to financing needs determined by the investment strategy. Evidence also shows that financial leverage is positively related to past growth and negatively with past profitability.

Survey-based Papers

Graham and Harvey (2001)	4400 FEI firms. 1998 Fortune 500s, from which 313 were also FEI firms.	Financial slack and bond ratings were found the most relevant factors for debt policy. Responses also suggest that recent stock price performance is an influential factor in timing a new equity issue. Other factors include the degree of stock undervaluation and fear of earnings dilution. Moderate support is reported for the target capital structure policy. Evidence is not entirely consistent with the adverse selection problems associated with the pecking order hierarchy of financing.
Babu and Jain (1998)	Sample of 1300 companies selected on the basis of stratified random sampling from the official directory of the Bombay Stock Exchange.	Achieving financial flexibility and long-term survivability is indicated as an important corporate financial objective. A preference for internal to external financing is reported and this is viewed as support for the pecking order hypothesis.
Jong and Dijk (1998)	CFOs of 168 non-financial firms listed on the Amsterdam Stock Exchange in May 1997.[v]	Free cash flow agency problems are likely (overinvestment) are potentially relevant.
Kamath (1997)	CFOs NYSE (Dec 31, 1988) firms excluding Fortune 500's industrial firms of 1989 and all financial intermediaries.	Survey participants were found to be more likely to follow a financial hierarchy than to target a capital structure. Those who declared following a target capital structure policy, considered that the industry average debt ratio was an important factor in determining such policy. Respondents who indicated following a pecking order of financing, related debt ratios with past profitability and growth. Further, it appears they are unlikely to engage in signaling activity with long-term financing decision-making. Only a minority (20 percent) admitted that takeover threats might influence capital structure choice. A similar percentage was likely to underinvest if financially constrained. In contrast, almost all respondents would avoid dividend payout cuts not to forego attractive new investment opportunities.
Kester *et al.* (1997)	CEOs CFO's sample of firms listed on	Survey responses suggest that Lintner's dividend model is a relevant description of

	Australian Stock Exchange, Stock Exchange of Hong Kong, Kuala Lumpur Stock Exchange, Jakarta Stock Exchange, Philippine Stock Exchange, Stock Exchange of Singapore.	corporate behavior in this area. In addition, signaling and clientele effects of dividend policy are also acknowledged. Respondents indicated their preference for internal equity what is seen as supportive of the pecking order of financing in detriment of the target capital structure. Results were mixed in relation to the preferences for external financing. The long-term survivability of the firm was considered the most relevant consideration for financing decision-Making.
Trahan and Gitman (1995)	Fortune 500 largest industrial companies and Forbes 200 best small companies.	The authors report that "overall the respondents appear to have little interest in the current state of academic research in corporate finance." Moreover, it is concluded that respondents deemed that "existing academic research can be better explained and operationalized."
Jog and Srivastava (1994)	CFOs TSE-300 Canadian firms and large foreign-owned and private firms operating in Canada (April 1991).	Findings reveal that financial slack, not the lack of profitable investment opportunities, is viewed by respondents as the primary obstacle to the undertaking of new investment opportunities. This result is consistent with the underinvestment hypothesis and indicates that the survey participants perceive the relevance of equity capital adverse selection costs. Thus, results provide a strong support for asymmetric information hypothesis concerning its impact on firm's financing and investment decisions.
Kester, Chang and Tsui (1994)	A potentially severe limitation of the investigation results from the survey being conducted in Hong Kong and Singapore in the early 1990s while in the U.S. were conducted in 1983 and 1987.	Hong Kong and Singapore survey participants favored following a pecking order of financing hierarchy rather than a target capital structure. Consistent with that answer, respondents in all three countries ranked internal equity as their first choice for long-term financing. United States respondents scored debt ahead of new common stock, whereas Hong Kong respondents ranked new common stock higher than debt and respondents in Singapore preferred new common stock sold through rights offerings ahead of debt. This may indicate that corporate financial structure might evidence unique features in Hong Kong and Singapore when compared to the U.S.
Hittle, Haddad and Gitman (1992)	CFOs of Over-the-Counter 500s firms.[iv]	Findings provide support for the asymmetric information hypothesis suggesting that managers of firms with greater asymmetric information are more likely to believe their stock is mispriced, leading them to follow the pecking-order model of financing.
Norton (1991a)	1984 Fortune 500s firms	Although taxation was deemed as an important consideration for financing decision-making bankruptcy costs was not. Thus, the static trade-off model was generally not supported. Results are not consistent with the agency cost explanation of capital structure decisions. Similarly, financial clientele effects were not detected. Little support was found for asymmetric information/signaling theories. However, some (weak) support is reported for the pecking order hypothesis.
Norton (1991b)	CFOs of publicly held small firms.[iii]	The survey results provide weak evidence in support of bankruptcy costs, agency costs, or information asymmetries theories. Some support is reported concerning the pecking order model as well as a desire to avoid the debt overhang. Further, evidence shows that the effects of market factors and managerial preferences, particularly the strong aversion to debt, are relevant considerations in determining capital structure policy.
Pruitt and Gitman (1991)	CFOs 1987 500s firms plus second 500 largest firms drawn from Compustat industrial files.	Findings suggest that financing policy is not independent of investment decisions. Further, dividend policy was indicated as not being determined by the firm's investment and financing decisions.
Pinegar and Wilbricht (1989)	1986 Fortune 500s firms	Indicate that the pecking order theory is more descriptive of how financing decisions are made in practice than Miller and Rock's (1985) model or the static tradeoff model. However they point out that their results "are unlikely to support any of the models above to the exclusion of the others".
Norton (1989)	1984 Fortune 500s firms	Factor analysis identified nine determinants of capital structure choice of survey participants, which explain 66.7 percent of the variation in their responses. Those determinants are: taxes and market concerns, financial flexibility, agency costs, information asymmetries, and signaling. The last three determinants may be of limited importance in their affects on respondents' capital structure decisions.
Scott and Johnson (1982)	1979 Fortune 1000's	Survey results suggest that survey participants adhere to the optimal capital structure concept. Further, respondents seem to subscribe to the principle that financial leverage affects common stock price.
Baker, Gallagher and Morgan (1981)	Two random samples of 150 NYSE's listed firms.	Major reasons indicated for undertaking share repurchase are the investment of idle cash or using it in managerial compensation programs. Undervalued stock and excess cash are deemed as necessary conditions for successful stock buyback programs. Other findings include the disagreement of respondents that share repurchases and dividend payments are substitutes., and that stock repurchases may be detrimental for the firm's capital structure.
Stonehill *et al*. (1975)	87 manufacturing firms in electronic, paper, food, and chemical industries, in France, Japan, Netherlands, Norway and U.S.A.	Financial risk appears to be the most important determinant of firm's financial leverage policy. Other determinants are financial flexibility and capital market conditions. Industry effects were not found.

[i] These conclusions seem diametrically opposed to Demirgüç-Kunt and Maksimovic (1994) what is in our view inexplicable once both papers used the same data set.
[ii] His analysis is prior to the Bankruptcy Code enacted by the Bankruptcy Reform Act of 1978 and applicable to cases filed after October 1, 1979, which revoked the former Bankruptcy Act of 1898, as amended, among others, by the Chandler Act.
[iii] Firms were sampled from Inc. 100 (May 1987), Financial World 500 (August 1987), Forbes 200 (November 1987), and Business Week 100 Best Small Growth Companies (May 1987). Criteria for firm inclusion in the sample were differentiated across periodicals.
[iv] Largest 500 OTC industrial firms selected from CRSP files sorted based on December 1988 market value of equity.
[v] The investigation was designed to collect questionnaire data and to use confirmatory factor analysis with structural equation modeling.

Chapter 3

The Theory of the Banking Firm Capital Structure

CHAPTER 3: The Theory of the Banking Firm Capital Structure

> One means of expanding on the previous evidence is to study the determinants of leverage in an industry exhibiting extreme leverage choices. Some of the best examples of this situation are commercial banks and savings and loan associations, which typically have leverage ratios of 95 percent debt to assets or higher.
>
> Ronald Masulis, *The Debt/Equity Choice*

3.1. INTRODUCTION

In the last two decades the question of banking firm's capital structure[308] emerged as a matter of generalized concern gathering considerable scrutiny and fostering a vivid debate among academics, public policy-makers, banking community, capital market participants, supervisory and regulatory authorities alike. Not surprisingly, an extensive body of literature has developed as a result of the attention dedicated to the matter by both scholars and practitioners.[309]

Plausibly, the awareness gathered by the problem of the banking firm's capital structure, is related to the apparent inconsistency between the well-known prediction — supported by the Modigliani and Miller's (1958) theory — that firms' capital structures should vary randomly across firms and industries,[310] and the acknowledged empirical regularity that banks tend to exhibit *clustering* capital ratios and high levels of financial leverage.[311] Yet, we still have a limited understanding of why banks are so extremely

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[308] As observed in Kane (1992) "in the field of financial institutions, capital means *corporate capital*" (emphasis in original).

[309] See, for example, the special issue (Volume19, 3-4) of the *Journal of Banking and Finance* dedicated to "The Role of Capital in Financial Institutions". The recent high level of share repurchases in the U.S. banking industry (see, e.g., Hirtle 1998; and Davis and Lee 1997). In the non-academic literature see, among others, *The Economist* (October 17th 1998, 15): "The case for toughening capital requirements is particularly strong for banks that are implicitly backed by taxpayers, whether through deposit insurance or because they are judged too big to fail." In a recent report on European Banks Schroders (1997, 12) suggests that "the pursuit of an efficient capital structure has […] become a priority." See also Davis and Lee (1997) for "*A Practical Approach to Capital Structure for Banks*."

[310] It is generally accepted that there is an interindustry effect in the observed capital structures of the real world firms due to the uniqueness of each industry's business. This intraindustry variance is commonly attributed to the idiosyncratic business and financial risks of individual firms. Within the banking industry, which is widely recognized as exhibiting low capital-to-assets ratios, nonetheless, management of an individual bank still has to decide upon the level of financial leverage targeted as the *optimal* for maximizing the present value of the cash flow stream generated by its operations.

[311] Both Leland and Pyle (1977) and Jensen and Meckling (1976) provide arguments in support of banks being more highly leveraged than other industries. As pointed out by, e.g., Berger, Herring and Szegö (1995)

levered, and therefore we lack a plausible and comprehensive explanation for what considerations drive their capital structure decisions. The evidence contradictory with the randomness hypothesis of banks' capital structure has been theoretically interpreted as the result of the departure from the presumptions of the Modigliani and Miller's *ideal* economy. However, when we abstract from an environment characterized by the presence of frictional, incomplete and imperfect capital markets, it can be shown that the existence of banking firms becomes irrelevant for social welfare in the same fashion capital structure turns immaterial to a firm's value.[312] This result would be obtained as a consequence of in such framework economic agents being able to create their own *homemade financial intermediation*.

According to mainstream academic banking literature it is arguable that the substantive questions of the determination of the *optimal* level and the *optimal* composition (mix) of banking firms capital are susceptible of being handled within the framework of the corporate capital structure theory (e.g., Dowd 1996, and Merton 1990).[313] This view is consistent with Wall and Peterson (1996) argument that, theoretically, "taxes, deposit insurance, bankruptcy costs, and managerial incentives may play a significant role in determining the optimal level of bank capital". One possible explanation for the actual ambiguity, according to Dowd (1996), is the excessive emphasis that traditional banking literature has put in stressing the dissimilarities between banking firms and non-financial firms, somewhat neglecting their similarities.

In this study we adopt the point of view that a banking firm, because of the idiosyncratic nature of its financial intermediation activity, must be seen, simultaneously, as a *firm*, a *financial intermediary,* and a *regulated entity*. As a firm, a bank's capital structure choice tends to resemble its non-financial counterparts, and therefore is likely to

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it is a tradition in the banking industry using the *capital ratio* — as measured by the relation between total equity and total net assets — to gauge a bank's financial leverage. Capital ratio is also known as *capital-assets ratio* and *leverage ratio* (see, Saunders (2000, 453). We adopt the same viewpoint. The subject will be developed further in this chapter.

[312] Coase (1960) suggests the notion of *frictionless* market.

[313] For Dowd (1996) "it is also useful to compare banks to other (i.e. non financial) firms that issue debt and equity." In the same vein Merton (1990) posits that "like business firms, financial intermediaries raise capital for operations by issuing stock and debt to investors."

be handled according to the (non-financial) firm's capital structure theory.[314] Because of its role as financial intermediary a bank's capital structure should also reflect the inclusion of considerations that are industry specific.[315] Finally, as a regulated entity because the structure of incentives induced by regulatory and supervisory jurisdiction determines a unique interaction between bank's capital base and various instruments of the regulatory intervention.

This last argument implies that, given the mandatory requirements for banks' capital standards, banking firms are likely to be confronted with both *voluntary* and *involuntary* capital structure decisions (e.g., Besanko and Kanatas 1996, Cornett and Tehranian 1994, and Keeley 1989). The first ones are taken in the very same setting as non-financial firms and, arguably, under the same determinants that are hypothesized in the capital structure theory for those firms. The involuntary capital structure decisions are enforced by compliance prescriptions dictated by violations of the mandatory regime of capital adequacy requirements issued by regulators.[316] As explained earlier in this investigation, we are predominantly concerned with banks' voluntary capital structure decisions, which have been largely overlooked in this literature.

The examination performed in this chapter focus on the capital structure problem in a banking habitat, and aims at being the theoretical foundation of our empirical investigation conducted in chapter 5. More specifically, of the set of testable propositions embedded in the survey instrument.

This chapter is organized as follows. In the next section we analyze the implications of modern banking theory for banks' capital structure. Section three presents a discussion of the banking firm's capital structure theoretical framework — under a perfect and frictionless capital markets approach, and under an imperfect and frictional capital markets perspective — aiming at identifying the main (structural) features of model of the banking firm appropriate for developing hypotheses for empirical testing.

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[314] Wall and Peterson (1998) argue that "[t]he theory of security issuance for U.S. banks incorporates both the theory of capital structure for nonfinancial corporations and the unique features of banks."

[315] As observed by Wall and Peterson (1998) "[b]anks are private corporations that operate in a special regulatory environment. As private corporations, their capital structure decisions are subject to the same influences as other corporations. These influences include factors that would lead to an optimal equity-to-debt ratio in a static setting as well as dynamic adjustment costs such as the costs of issuing new equity."

[316] Or candidate to regulators' *prompt corrective action* (see, e.g., Saunders 2000, 454). For a recent survey of theoretical literature on banks capital regulation see Santos (2000).

3.2. THE THEORETICAL FRAMEWORK OF THE BANKING FIRM'S CAPITAL STRUCTURE DECISIONS

The debate on the (optimal) capital structure for banking firms parallel the ubiquitous dissension perceived in the capital structure problem of non-financial firms. Both are, recognizably, controversial fields of inquiry, and sources of interrogation, doubt and even perplexity.[317]

The problem of choosing the appropriate amount of capital to carry on the balance sheet of a banking firm is not a trivial one. Carrying little capital is costly, not only because of the disciplinary effects of capital markets, but also because it increases the probability of regulatory intervention. This interference might, for example, restrict (or even prohibit) paying dividends, disallow entering in new corporate control transactions, require disposal of assets, or even reshuffling the management team. Likewise, carrying excessive capital on a bank balance sheet is also costly and should be returned to shareholders.

Generally it is accepted that the link between the different considerations that converge in a bank' capital structure decisions is multifaceted. Therefore, as we suggested earlier, the problem of the banking firm capital structure might be advantageously investigated using a *multiple simultaneous approach*, which seems to be helpful in order to allow the development of a realistic and robust environment for the analysis. In line with this viewpoint, the banking literature suggests that such an approach should encompass the distinct (although related) perspectives of a bank, as a firm, as a financial intermediary, and as a regulated entity. Moreover, the analysis should start with the relaxation of the considerations that are hypothesized as relevant for the valuation of non-financial firms. Subsequently, we should attempt to incorporate regulatory features to the model.

Thus, the study of the role of a banking firm as a financial intermediary and its implications for its capital structure lead us, firstly, to inquire about the more general issue of why banks do exist. Answering this question may shed light on the question of whether or not banks' capital structure decisions are influenced by the idiosyncratic nature of the banks' role as financial intermediaries.[318]

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[317] As Bhattacharya and Thakor (1993) interrogate: "How should banks be financed?" Or Miller (1995) question: "Do the M&M propositions apply to banks?"

[318] Bhattacharya and Thakor (1993, 3) characterize financial intermediaries as "providing brokerage and qualitative asset transformation services. A broker brings together providers and users of capital without changing the nature of the claim being transacted, whereas a qualitative asset transformer processes risk in altering the attributes

It is well documented in the literature that in an Arrow-Debreu economy, with complete, perfect and frictionless capital markets, and complete contracting, financial intermediaries have no role in the resource allocation. In this kind of world, capital markets participants are able to achieve Paretian allocative efficiency[319] on their own and, therefore, financial intermediaries are ineffective in improving agents' welfare (e.g., Santomero and Wilson 1997). In such a frictionless world — resembling the one depicted by Modigliani and Miller 1958 — characterized by the presence of complete and perfectly competitive markets, free and full information, and homogeneous expectations among all market participants, economic decisions are shown to be independent upon the financial structure.[320] In such an environment, economic agents can construct portfolios which offset any position taken by an intermediary, since individuals and firms can produce their own *homemade financial intermediation* at little or no cost. Thus, financial intermediation activity cannot create economic value.[321] This implies that financial intermediaries are inconsequential for the valuation of real productive agents, and that no actual or potential benefits emerge from the existence of intermediaries, such as banks (e.g., Lewis 1991).[322]

The existence of the banking firm has been justified in the literature on the grounds of a healthy panoply of arguments. The most prominent explanations are rooted on considerations related to transaction costs, to divergences in agents' objective functions, and to informational asymmetries.[323]

Thus, the rationale for the emergence of a banking firm as an endogenous response to market and contracting incompleteness and imperfections, should be seen as economically advantageous in, *reducing transaction costs* (e.g., Allen and Santomero

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of the claim". Tobin (1989, 39) conceptualizes financial intermediaries as "enterprises in the business of buying and selling financial assets."

[319] Arrow (1974) associating the notion of efficiency (or optimality) to Pareto points out that "we speak of allocations or of systems as being efficient […], when there is no other system or allocation which is better in this strong sense, which is better in the sense of making everybody better off."

[320] In this setup contracts are inevitably complete. Technical indivisibility is an additional required assumption to obtain market completeness.

[321] As explained by, e.g., Allen and Rai 1996, and Fama 1980 the assumption of perfect capital markets is inconsistent with the existence of financial intermediaries.

[322] As observed by Berger, Herring and Szegö (1995, 394) "financial institutions […] lack any plausible rationale in the frictionless world of M&M."

[323] Other authors have argued that banking firms are special. The core of their argument is the interaction of three functions of banks: (1) the supply and administration of transaction and payment services; (2) liquidity and credit providers; and (3) transmitters of the impulses of monetary policy to the economy.

1998; Benston and Smith 1976),[324] *resolving or mitigating moral hazard and adverse selection problems* (e.g., Leland and Pyle 1977), *producing and processing information* (e.g., Diamond 1984; Campbell and Kracaw 1980), *providing monitoring services* as *delegated monitors* (Diamond 1996, 1984), or *supplying liquidity services* (e.g., Diamond and Dybvig 1983; Bryant 1980). [325, 326] Overall, it is reasonable to assume that under an incomplete and imperfect market setting financial intermediaries have a role — they improve the allocation resources.

The analysis of a banking firm capital structure in this framework can be twofold. First, the convergence of the set of incentives determined by its role as a financial intermediary.[327] Second, the implications of relaxing some of the market frictions and imperfections — such as income taxes, costs of financial distress, transaction costs, asymmetric information, and regulation — in the economic environment that characterizes the banking market.[328]

Under the *traditional* theory of financial intermediation, a banking firm is portrayed as an *asset transformer*[329] (see, e.g., Gurley and Shaw 1960), which pools resources in an

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[324] Rajan (1998) emphatically points out that the banking firm — in its actual institutional form — emerged, in part, to improve transaction possibilities over what was contractible through the market place, which were affected by contractual incompleteness and property rights unsatisfactory enforcement problems. In this sense, the presence of regulatory environment may be seen as a reinforcing mechanism to achieve contracting efficiency.

[325] For substantive contributions for this strand of the banking firm literature see, e.g., Allen and Santomero (1998), Freixas and Rochet (1997), Swank (1996), Greenbaum (1996), Greenbaum and Thakor (1995), Merton (1995), Bhattacharya and Thakor (1993), Lewis (1991), and Fama (1985, 1980).

[326] Support for the former theory is built on the argument that banks enjoy a superiority in providing debt with inside information which makes them benefit from economies of scale and/or comparative advantages in the provision of information about borrowers vis-à-vis capital markets (e.g., Fama 1985). Besides enjoying economies of scale as information producers, banks establish long-term relationships with their customers, that allow them to gain private information on the *true* characteristics (and therefore risk) of their borrowers. This information is not readily available to other bank or non-bank competitors (e.g., Demsetz, Saidenberg, and Strahan 1996; and Petersen and Rajan 1995), and therefore is relevant in explaining why banks "play an important role in mitigating information problems and other capital market frictions that make external financing costly" (Houston, James and Marcus 1997). These relationships are economically advantageous in the sense that they allow lowering the costs of loan origination and consequently increasing the profitability of lending activity.

[327] Flannery (1994, 311) observes that although "less routinely acknowledge, at least within the banking literature, is the fact that […] incentives toward asset substitution, high leverage, and moral hazard characterizes any credit relationship in which a firm's claimants differ in their information and control rights."

[328] Santomero (1984, 593) suggests that to "[…] derive an optimal capital structure [for a bank], one must determine, first, the role played by the financial institution and, second, the extent to which one wishes to deviate from the perfect market paradigm in explaining its operation." See also Berger, Herring, and Szegö (1995) for an argument in the same direction.

[329] In this asset transformation activity resulting from deposit-taking and lending banking firms, arguably, benefit from economies of scale in its contracting technology, which determines allocative efficiency

attempt to match / intermediate economic agents' profiles of consumption and investment.[330] Under this approach, the banking firm's most prominent function is to intermediate between savers and borrowers, receiving (commonly, short-term maturity) deposits, and investing in (typically) less liquid and longer maturity assets, implying that banks are likely to present a congenital *mismatched* balance sheet (e.g., Calomiris and Kahn. 1991).[331] This view of the financial intermediation activity performed by banks — deposit-taking and lending — expose them to several (idiosyncratic) risks,[332] and determine the emergence of a structure of incentives that is hypothesized to be influential for the capital structure decisions of a bank. In this framework, the financing structure of the banking firm is likely to suffer the influence of such environmental factors, and hence exhibit a potentially unstable and unpredictable trajectory.[333] Additionally, as a result of the fierce competition developed in banking markets during the last quarter of century, banks experienced significant erosion in their traditional deposit-taking and lending activity. These unfolding events carry noticeable implications for banks' financing structures.[334]

Leland and Pyle (1977) and Jensen and Meckling (1976) emphasize the informational asymmetries and agency problems that are present in financial intermediation contracting to, simultaneously, provide a robust argument in favor of the existence of financial intermediaries, and an explanation for them to be highly leveraged.

As observed by Greenbaum and Thakor (1995, 49) "there is no compelling distinction between F.I.s [financial intermediaries] and others on the

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superiority over market price mechanism. In the sense, transaction costs advantage is then crucial to explain why banks do have a role in the economy (Coase 1937; Williamson 1975, 1979, 1981, 1985).

[330] More recently, Merton (1995a) proposed a functional theory of financial intermediation. In this paradigm, in which functions performed by financial intermediaries prevail over their institutional, architecture, those functions are: (1) transferring resources across time and space; (2) managing risk; (3) clearing and settling payments; (4) pooling resources and subdividing shares; (5) providing information; and (6) dealing with incentive problems.

[331] This mismatching exposes a depository institution to both interest rate and liquidity risk.

[332] Such as, credit risk and market risk concerning the primary securities issuance, liquidity risk related to the secondary securities issuance and insolvency risk (mainly) in less favorable states of the world. Liquidity risk, in particular, may become a severe problem because of the embedded put option featured by deposits, which gives their claimants the right to immediate redemption.

[333] Payoffs to bank leveraged equity resemble a *call option* whose value can be enhanced by expanding the volatility of the bank value thus providing incentives to choose riskier policies. For example, investing in assets generating more volatile cash flow profiles or by dynamically mismatching asset-liability *duration gap*. Moreover, insiders can also increase the financial risk of the bank incurring in, e.g., risk shifting, asset substitution or claim dilution behavior.

[334] Edwards and Mishkin (1995, 27) note in this regard that "as a source of funds for finance intermediaries, deposits have steadily diminished in importance."

right-hand side of the balance sheet, except that F.I.s tend to be more leveraged". Further, they assert that "[b]oth [industrial firms and financial intermediaries] finance their assets by selling their own debt and equity." In the same vein, Calomiris and Kahn (1991) argue that capital structures of banks and non-banking firms show substantive resemblance concerning the role played in each kind of institution by demandable debt and debt financing, respectively. They substantiate their argument pointing out to what they view as similarities between absolute priority rules commonly applied to short-term senior debt claims in non-financial firms and monitoring activity developed by deposit's claimants in a bank.

Summarizing, banking firms arise thus in a setting characterized by the presence of incomplete and imperfect markets, imperfect contracting, and imperfect and asymmetric distribution of information among financial markets participants. Markets incompleteness and imperfections provide an explanation for both, the existence of the banking firm and the relevance of its capital structure, and therefore become *la raison d'être* of banks. Additionally, we should not exclude the hypothesis that financial intermediaries, such as a bank, decide their capital structure within decision patterns similar to those of non-financial firms. Consequently, we may argue that the theoretical and empirical literatures associated with the capital structure problems of non-financial firms, once taken into account the adjustments implied by the specificity of their financial intermediation function and the effects of regulation, are able to help explain banks' capital structure decisions.

3.3. The Banking Firm Capital Structure Problem in an Imperfect and Incomplete Contracting Framework

As pointed out earlier Modigliani and Miller established the conditions under which the firm's capital structure is irrelevant.[335] As pointed out by Berger, Herring and Szegö (1995) and others, there is a growing strand of the banking literature that supports the notion that the departure from Modigliani and Miller's frictionless framework is to rationalize the existence of the banking firm, and to explain why "financial institutions may be able to enhance their market values by taking on an 'optimal' amount of leverage."[336]

[335] See Miller (1995) for a discussion of the relevance of Modigliani and Miller's propositions to banking.
[336] Further, Berger, Herring and Szegö (1995) suggest "[t]hese considerations apply quite broadly to all firms."

Under the environmental, operating and economic conditions of the Modigliani and Miller's (1958) model, one can argue that having or not having equity capital is a matter of indifference. However, just like it is empirically documented for non-financial firms, this concept of a banking firm's capital structure is not consistent with banks' capital structures observed in the real world.[337] If M-M's irrelevance proposition holds, then by implication financial leverage distribution (both at industry and firm level) should be, inherently, random. Therefore, the empirical observation of any form of financial leverage *clustering* is not consistent with the theoretical prediction.

A number of authors[338] provide arguments in support of the hypothesis that the problem of the banking firm's capital structure choice can be approached and explained within the framework of the corporate capital structure theory typically associated with the non-financial firms. This viewpoint receives the support from, among others Dowd (1996) and Osterberg and Taggart (1983).[339] In addition, the literature also recognizes that the capital structures of financial and non-financial firms tend to reflect the dissimilarities of their respective productive activities, just in the same fashion as among non-financial firms. *A propos*, some authors conjecture that one possible explanation for this situation may arise from the fact that the main theoretical propositions offered for non-financial firms have not yet been incorporated into the banks' capital structure decisions literature.

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[337] Saunders and Wilson (1997) provide empirical evidence on the U.S., Canada and U.K. banks the secular evolution of *capital ratio* (as measured by the book value of equity capital and to the book value total assets) suggesting the existence of empirical regularities on the distribution of the capital ratio. These results are consistent with Lewis (1991, table 4.1) who document evidence on the (equity) capital-to-(total) assets ratio of U.K. and U.S. banks during the period 1880-1988, and Kock (1992) who document that capital ratios in U.S. banks "rarely exceed the 10 percent mark." Hasan (1997) report that "historically, while these ratios […] averaged around 20 percent at the turn of the century, comparable ratios today are closer to 7 percent." Hirtle (1998) acknowledges that the U.S. bank holding companies "have significantly increased their capital ratios since the late 1980s and early 1990s." Furthermore, the author documents that "at the close of 1997, average capital ratios for all U.S. bank holding companies were 9.0 percent, 12.5 percent, and 7.1 percent for tier 1 capital, total capital, and leverage ratios, respectively." "The average tier 1 and total capital ratios for all U.S. bank holding companies had declined about 50 basis points from their end-of-1996 levels. These drops were even more pronounced among the twenty-five largest U.S. bank holding companies, whose average tier 1 and total capital ratios had decreased by 62 and 69 basis points, respectively."

[338] Among others, Fisher Black, Merton Miller, Stephen Buser, Andrew Chen, Edward Kane, Eugene Fama, Robert Taggart, Stuart Greenbaum, Yair Orgler, Anthony Santomero, William Osterberg, Kenneth Froot and Jeremy Stein.

[339] Dowd (1996) suggests that "it is […] useful to compare banks to other (i.e. non-financial) firms that issue debt and equity." Osterberg and Taggart (1983) posit that non-financial firm's capital structure theory provides "a useful framework for analyzing bank capital structure."

Dietrich and James (1983) argue that the functions of equity capital in both banking and nonfinancial firms do not differ qualitatively.[340] Some authors suggest that with no regulation and deposit insurance the capital structure decision of a bank is similar to that of a non-financial firm. In contrast, others assert that corporate finance theoretical models also support the banks' capital structure decisions (e.g., Santomero 1984; and Buser, Chen and Kane 1981).[341, 342] Chen and Mazumdar (1994), in their turn, argue that the nature of banks' liabilities and the regulatory framework in which they must operate are two important factors in discriminating between capital structures of banks and non-financial firms. In the end they observe that "the bank capital structure debate [...] remain unresolved."

Chen, Doherty, and Park (1988) develop a contingent claim analysis of optimal capital structure of depository financial intermediaries, integrating both their operating and financial decisions. They bring together deposit insurance, reserve requirements, liquidity services, and the effects of taxes. They show that an array of capital structures, including corner solutions and interior optima, are possible even without taxes and other market frictions. They also argue that the optimal capital structure will not change even in the presence of regulatory deposit insurance priced at its actuarially fair value. Thus, we can question whether capital structure is a matter of relevance for a banking firm. Various authors have attempted to shed some light on this question.

Capital structure is widely recognized to be a critical problem for a bank. Various considerations are typically offered to illustrate this view. First and foremost are

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[340] Dietrich and James (1983, 1651) argue that "[b]ank capital serves two purposes; it is a source of funding and it is a residual capable of absorbing losses. These two functions of capital in banking do not differ qualitatively from the role of capital in a nonfinancial corporation."

[341] Damoradan (1999) argues that the application of a *cost of capital approach* to financial firms, such as banks, might be problematic on several counts. Firstly, in relation to interest coverage ratio spreads. Secondly, to bank's financial leverage measurement problems. Lastly, to bank's capital regulatory jurisdiction.

[342] For a different perspective see Sealey (1983). The author argues that the theory of corporate finance — under conditions of perfect capital markets — remains largely inapplicable to the decision-making of depository financial intermediaries' for three main reasons. First, because banking firms can only exist in the presence of an imperfect and incomplete market framework. Second, because existing models ignore the liquidity services provided by banks. Third, because of the randomness of deposit financing, which is unique to deposit-taking institutions (also Rajan and Diamond 1999). Sealey proposes a theory of capital structure decisions of financial intermediaries based on market equilibrium. His valuation model of a financial intermediary differs from that of a non-financial firm in terns of the liquidity premium paid by the public. Capital structure decisions are not, in general, a matter of indifference to shareholders of intermediaries. If substantial economies of scale exist in the production of deposit services, then high leverage decisions by intermediary management can be justified as maximizing shareholder utility.

mandatory regulatory capital adequacy requirements, but also institutional restrictions to *pure capital structure adjustments*,[343] income tax regime, asymmetrically informed contracting parties, and divergences on claimholders' objective functions.

As Rajan and Diamond (1999) point out in their *theory of bank capital*, this kind of financial firm chooses its capital structure by trading-off three effects of more capital "[it] increases the rent absorbed by the banker, increases the buffer against shocks, and changes the amount that can be extracted from borrowers." Further, they argue that the *optimal ex ante bank capital structure* "depends on the degree of competition in banking, the nature of the available pool of borrowers, and the amount of own capital the banker can bring to the business."

Although disparate in their foundations and consequences, it is possible to find a common denominator to all these assertions. As the argument goes, the amount of capital banks actually carry in their balance sheets results — most certainly in a non-exclusive fashion — from the interaction of considerations mentioned above, and may be in excess of a bank's *optimal* economic capital.[344] This difference represents an economic inefficiency for the banking sector, translating into an unnecessary opportunity cost. Furthermore, this may distort competition in banking markets.

The role and actual levels of equity capital carried on banking firms' balance sheets has been satisfactorily described in the literature. Saunders (2000, 442-443), for example, summarize in a textbook fashion the functions perform by equity capital in banks: (1) "[t]o absorb unanticipated losses with enough margin to inspire confidence and enable the FI to continue as a going concern"; (2) "[t]o protect uninsured depositors in the event of insolvency and liquidation"; (3) "[t]o protect FI insurance funds and the taxpayers"; (4) "[t]o protect the industry against increases in insurance premiums"; (5) "[t]o fund new assets and business expansion"; and (6) "[to assist regulation in] restraining the rate of asset growth".

[343] We define a *pure capital structure adjustment* as the corporate transaction that changes the relative amounts of debt and equity securities keeping invariant the value of its asset base. Leveraged buyouts provide an illustration of the concept. In Portugal, as in other European countries, there are legal quantitative restrictions on share repurchases.

[344] In terms of Pareto optimality conditions.

The canonical argument underlying the justification for the need of an adequate level of equity capital in the banking firm is rooted in its pivotal role as a solvency cushion in case of adverse shocks, such as, loan losses or shrinking demand due to economic cycle downturns.[345] These kinds of events may trigger financial distress and ultimately insolvency, which because of deposit insurance mechanism is resolved at taxpayer expense.

As suggested by Osterberg and Thomson (1989) "the primary function of bank capital is to serve as a cushion against unanticipated losses on assets, thereby ensuring the solvency of the bank." Besides this function a bank capital base also serves the implementation of its strategy and thus, performs a crucial role in financing the bank's growth.

Rajan and Diamond (1999) argue that "[t]he role played by capital in banks, or more specifically in intermediaries, is different from the role it plays in industrial firms." Their underlying argument relates to the inability of a non-financial firm to "use a fragile capital structure to promise claimants more" (Diamond and Rajan 1998). They further argue that deciding upon increasingly costly capital levels should be determined by considerations other than liquidity problems.

Overall, equity capital appears to serve as a guarantee of financial independence, and to some extent, to allow easier and less costly access to debt financing. Equity capital has also a role in *reassuring* creditors of the value of their claims, and as a buffer to losses particularly in adverse states of the nature. It is also recognized that too little equity capital could be an impediment to investment.

An implication of this enumeration is that a minimum level of capital is crucial to ensure the viability of a banking firm (Lewis 1991). Another is that depository institutions tend to have a high degree of leverage because their safekeeping and intermediary functions typically benefit from (implicit and explicit) Governmental guarantees that reduce depositors' perception of their likelihood of defaulting (Boyd and Prescott, 1988).

[345] The banking problems experienced by Asian economies, which were caught in the recent financial markets' turmoil, brought to the forefront the deficiencies of banks' capital-base in that particular geographical area.

Bank capital is also a source of concern because of banks' central role in the financial system, which should justify their regulation and supervision. This argument, however, still remains unresolved.[346]

3.3.1. *The Role of Income Taxes and Financial Distress Costs in the Banking Firm Capital Structure Decision*

In the banking industry and under many tax regimes, the deductibility of borrowing costs for income taxes purposes *also* represent an element of the tax advantage of debt financing over equity (e.g., Osterberg and Thompson 1996; and Marcus 1983). In these circumstances, when a bank's costs of debt financing are tax deductible and dividend payments are not — in the same fashion as non-banking firms — debt financing should be viewed as tax-advantageous over equity.

Although banking firms, as suggested by Scholes, Wilson and Wolfson (1990), are not '*prototypical taxpayers*', both theoretical models and empirical tests seem to suggest that banks design tax policies and manage their tax liability so as to adjust "their economic balance sheets as their tax-paying status" changes (ib., 626).[347] Other symptoms appear to reinforce the notion that banks, either in aggregate or at the individual level, seem to accommodate to the modifications in the tax regime.[348] Osterberg and Thompson (1996), for example, in their examination of the impact of regulatory capital standards on leverage ratios for a sample of 232 U.S. bank holding companies (BHCs) during 1986 and 1987, document that financial leverage of BHCs and municipal securities portfolio seem to be simultaneously determined, the latter being used to minimize tax liability.[349]

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[346] For the effectiveness of bank's capital regulatory framework in the U.S. see, e.g., Hovakimian and Kane (2000), and Wagster (1996). See also Kim and Kross (1998) for a examination of the impact of the 1989 bank's capital adequacy regulatory requirements on loan loss provisions and loan write-offs of U.S. banks. Mota (1994) examines the effects of capital requirements enforced by the Basle 1988 Accord on Portuguese banking system.

[347] According to author's estimates, between 1989 and 1998, the average implicit tax rate for a sample of Portuguese banks is 18.48 percent in simple average terms, and 20.46 percent in terms of the net total assets weighted average. See Chapter 5 for further details.

[348] Beatty, Chamberlain and Magliolo (1995) suggest that for banks "[t]ax management appears to be relatively unimportant in the discretion exercised over these transactions [accounting, investment, and financing]."

[349] In the U.S., prior to the Tax Reform Act of 1986, municipal bonds (the so-called MUNIs) provided many banks, especially smaller ones, with an important tax shelter from federal income taxes. However, except for special circumstances, this tax shelter has been removed, and thus is no longer available. It should be noted that Osterberg and Thompson's (1996) findings may be *contaminated* by the effects of the unique revisions in tax rules occurred during the sampling period. Scholes, Wilson and Wolfson (1990) report strong evidence

This conclusion may be interpreted as consistent with the *tax hypothesis* of Modigliani and Miller (1963) and thus shows the presence of a "significant association between tax status and [banks'] financing decisions" changes (ib., 649).[350] This hypothesis is also consistent with Osterberg and Thompson's (1990) model, which at the individual bank level yields the prediction that income taxes are plausibly a relevant consideration in the capital structure decision of the banking firm. In the same direction but regarding the case of the financing behavior of commercial banks, Scholes, Wilson and Wolfson (1990) hypothesize that there is a relationship between their marginal tax rates and financing behavior.[351] Further, these authors document that their empirical tests provide evidence in support of a *tax clientele* effect in a sample of U.S. banks.

Besides the potential tax benefits associated with borrowing costs, banks have at their disposal other sources of incentives to manage banks' tax liability that provide the same income tax-deductibility as the costs of debt financing: this makes them perfect substitutes as tax-shields.[352] Among others, banks' managers have the ability to use other sources of tax relief, such as, the depreciation of fixed assets, provisions for loan losses, investment tax credits, and the *timing* of tax-accounting record, all with potential for influencing capital structure decisions (Gelfand and Hanweck 1987).[353]

As discussed earlier, DeAngelo and Masulis (1980) call our attention to the role played by the depreciation of fixed assets explaining its substituting effect. However, in banking the relative importance of this particular kind of assets is typically small, and thus the potential magnitude of this tax shield may be negligible.[354] A particular case in point is the amortization of *goodwill* involved in transactions of external growth acquisition. This intangible asset, under certain taxation environment — such as in the U.S. — is capitalized

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in support of the hypothesis that banks respond to changes in the tax rules relating to deductibility of interest expense incurred by investing in MUNIs, by adjusting their portfolios of this type of bonds.

[350] The argument that the deductibility of interest payments to debtholders for income taxes purposes at firm level has been demonstrated by Modigliani and Miller (1963). Miller (1977) extended the analysis in order to incorporate taxation effects at the investor personal level. See Chapter 2 for further details.

[351] Refraining from issuing very long-term maturity debt securities, as this particular kind of financing instrument was reclassified, in the U.S., as equity for income tax purposes, might illustrate this point.

[352] Portuguese Tax Code (article No. 33) attributes to banking supervisory authority — Bank of Portugal — as the lawful entity to regulate in this matter.

[353] As argued by Beatty, Chamberlain and Magliolo (1995) "tax incentives arise because firms can reduce the present value of tax payments by timing transactions."

and amortized over an extended temporal horizon. Differently, in other countries such as Portugal, accounting rules require goodwill arising in acquisitions to be deducted from equity capital over a (relatively short) period of time to be defined by the supervisory authority. This mandatory accounting procedure determines two different kinds of consequences. First, the acquirer might experience a significant decrease in its capital base and thus incur the risk of failing to comply with the regulatory capital requirements.[355] Further, to avoid that risk the bank may need to issue new equity capital at an inopportune time, hence incurring, among other consequences, in the well-known costs of asymmetric information. Second, in this framework the bank cannot benefit from any tax advantage from its acquisition, rendering the transaction less attractive in terms of economic value.

In banking, the importance of provisions for loan losses in terms of income taxes is well established.[356] Thus, it is conceivably an important source of tax savings, which is available to be used in the *management* of a bank's tax liability (e.g., Greenawalt and Sinkey 1988).[357] Henderson (1987) illustrates this behavior by showing that banks' loan-loss reserves for tax purposes exceed those for accounting purposes between 1978 and 1981. The opposite situation occurred in 1982.

Taxation may also have an impact on banks exhibiting a level of capital below the minimum required by regulation. In this instance, the bank may be willing to voluntarily disburse tax payments as the result of incurring in accounting transactions aiming at fostering the book value of its regulatory capital. The accounting recognition of profits as well as the postponement of losses both increases the book value of regulatory capital, lessening the regulatory costs either in the form of prompt corrective action or extended oversight with interference, among other issues, in the choice of the bank's financing policy. Additionally, this kind of *earnings management* may well have as a by-product effect a more profitable access to deposits given that the insurance provided to depositors is likely to reduce their required rate of return.

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[354] According to the estimates for our sample of Portuguese banks, between 1989 and 1998, net fixed assets represent 2.84 percent of net total assets. Annual fixed assets depreciation, during the same time period, represents 2.54 percent of total costs.

[355] Depending on the premium paid and the number of years allowed for offsetting goodwill.

[356] For our sample of Portuguese banks we estimate at 11.47 percent the average relative importance of provisions for loan losses to total costs during the period 1989-1998.

[357] The authors assert that "managers might have an incentive to maximize loan-loss deductions for tax purposes to minimize tax payments. Furthermore, because of differences in tax regulations and financial accounting standards, the tax deduction related to loan losses may not equal the expense reported on financial statements as the loan-loss provision."

A banking firm is not exempted from financial distress and bankruptcy risk. Raising financial risk by leveraging-up the bank's capital structure (assuming no regulatory intervention) entails a costly increase in bankruptcy risk.[358] Arguably, the bankruptcy costs associated with banking firms are of a different nature from those of non-financial firms, because of bank specific factors. Three major factors tend to explain why banking firms, like depository institutions, tend to face lower expected bankruptcy costs than non-financial firms — for the same level of financial leverage. The first factor is related to the effectiveness of bankruptcy administrative proceedings, the second factor is related to the governmental *safety net* regime, and the third effect is related to the so-called *too-big-to-fail* doctrine.[359]

Under most bankruptcy law regimes banks' insolvency and liquidation processes are handled outside the legal context of the bankruptcy law (e.g., Hetzel 1991).[360] The insolvency of a bank is, presumably, managed in a more expeditious and prompt fashion by regulatory and supervision authorities, than the insolvency of a non-banking firm, which is administered by ordinary bankruptcy courts (e.g., Berger, Herring and Szegö 1995; Kaufman 1994).[361] Interestingly, losses to creditors (including the public deposit insurer) from banks' insolvency are often smaller than losses from insolvency of non-banking firms, presumably because banks' resolution process is more efficient (Kaufman 1994; Masulis 1988).[362]

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[358] Because the probability of bankruptcy is a monotonically increasing function on financial leverage firms exhibiting higher levels of financial leverage should have higher probabilities of bankruptcy. Further, since bankruptcy costs are firm specific they are a primary determinant of differences in the capital structure across firms.

[359] The governmental *safety net* was designed and implemented to promote the *safety* and the *soundness* to the banking system. Its typical configuration includes mechanisms, such as, *capital adequacy requirements*, *deposit insurance*, *lender of last resort*, *discount window facility*, *regulatory forbearance*, and *disclosure requirements*.

For a review of bank runs literature see, e.g., Calomiris and Gorton (1991). Diamond and Dybvig (1983), e.g.,, discuss the role of deposit insurance a protective device for banks' deposits. See Barth *et al*. (1997) for a characterization of deposit insurance mechanisms across countries. According to Arshadi (1989) and Pyle (1986), among others, there is a clear link between capital and deposit insurance regulation.

[360] In Portugal, according to the nº2 of article 139º Decree of Law nº 298/92 from 31 of December 1992: credit institutions are not submitted to the provisions of bankruptcy, reorganization and creditor protective legal regimes. Article 2º of Decree of Law 132/92 from 23 of April 1992 endorsing the 'Código dos Processos Especiais de Recuperação da Empresa e de Falência' (Bankruptcy Code) states that its provisions are not enforceable to (besides other notable cases) to credit or financial institutions as well as insurance firms.

[361] Firms in insolvency face nontrivial — direct and indirect — bankruptcy costs associated with their financial condition. Such costs are recognized in the bankruptcy literature as positively correlated with the time spent in bankruptcy (e.g., Campbell 1997). On this ground, we may also argue that banks should have lower expected bankruptcy costs.

[362] It is debatable if the same claim may be made on a general welfare perspective.

The effect of safety net mechanisms on a bank bankruptcy are, to a large extent, determined by their insensitivity to risk, and by a bank's lower probability of bankruptcy. In this context, the distribution of safety net subsidies among insolvent banks may become asymmetrical, with the more financially debilitated banks likely to pocket more financial subsidies, hence reducing their bankruptcy costs.[363]

According to Saunders (1997), O'Hara and Shaw (1990) and others, the argument that banks may be *too big to fail* is grounded on the negative externalities entangled in the failure of a bank.[364] Thus, the probability that a large banking firm is liquidated because of failure is, *ceteris paribus*, lower than the similar probability for a non-banking firm of the same size.[365] The presence of the *too-big-to-fail* doctrine[366] in banking enhances the potential for moral hazard behavior. Once depositors and debtholders of large financial institutions perceive that they are likely to be protected if the institution fails, they have less incentive to monitor the institution and withdraw their deposits when the bank takes on too much risk.[367] Because of this lack of monitoring, large institutions might take on even greater risks than they might otherwise would, thereby making economic distress more likely.[368]

Summarizing, we argue that a banking firm, as a depositary institution, tends to experience lower expected bankruptcy costs for identical levels of financial leverage and size, than a non-financial firm.[369] The actual magnitude of a banking firm's bankruptcy

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[363] The lower probability of bankruptcy of banks might be due to the presence of subsidized deposit insurance 'insensitive' to risk.

[364] See, e.g., Black *et al*. (1997), Angbazo and Saunders (1997) and Hetzel (1991) for further details.

[365] Saunders (1997, 378) suggests that the *too big to fail* banks may be viewed by regulators "as being too big to be closed and liquidated without imposing a systemic risk to the banking and financial system."

[366] The presence of a too-big-to-fail policy in the US, which was announced in the aftermath of the Continental Illinois insolvency in 1984, seems to have encouraged increased risk taking on the part of large banks.

[367] As indicated by Boyd and Gertler (1993), large US banks did take on riskier loans than smaller banks and this led to higher loan losses for the large banks. In addition, large banks had smaller amounts of capital relative to assets than smaller banks, further increasing the risk that they faced.

[368] The expansion of the number of large financial institutions resulting from financial consolidation increases the pressure over the safety net and may eventually lead to more severe moral hazard problems that seem associated to the too-big-to-fail doctrine (e.g., Mishkin 1999).

[369] One dimension that strikingly differentiates banks and non-financial firms is related to the amount of off-balance items carried by both types of entities. Banking firms, typically, resort more heavily to off-balance activity than their counterparts. However, according to Lucas and McDonald (1987) "off-balance sheet commitments have little effect on the risk of bankruptcy."

costs, as well as the emergence of eventual returns to scale effects, remain open empirical questions ready for testing in the same fashion as they are for non-financial firms.[370]

Taking into consideration the above factors, capital structure choices may be determined by trading-off the incremental benefits of the deductibility of debt financing costs, depreciation, loan loss provisions and alike, against the incremental (direct and indirect) costs of financial distress and bankruptcy triggered by higher financial risk.[371] From this perspective, identifying and measuring the costs of financial distress is a critical step towards the definition of the optimal capital structure.

Orgler and Taggart (1983), building on a number of studies on non-financial firms' optimal capital structures developed a model of optimal capital structure for a banking firm. In their model, more aggressive use of leverage provides banks with more favorable tax treatment and an increase in the value of their deposit insurance. Offsetting these benefits are the (eventual) diseconomies of scale in producing deposit services and the deadweight costs of bankruptcy that are partially borne by a bank's residual claimants.[372]

Costs of financial distress include (1) the costs of transferring ownership from shareholders to creditors; (2) the losses that may occur as a result of the perception that bankruptcy may be imminent, even if it is ultimately avoided; and (3) the costs of conflicts of interest between shareholders and creditors that may lead to suboptimal operating, investment, and financing decisions.

Conceptually, the costs of financial distress may be thought as the present value of the economic distress costs of an all-equity bank plus the present value of the additional costs associated with leveraging up such bank. The economic performance of both the levered and the unlevered banks is equally undermined by the deterioration of assets' risk in adverse states determining, consequently, similar levels of economic distress. However, the leveraged bank will experience a greater loss of value because of the increased risk of bankruptcy associated with its leveraged condition.[373]

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[370] See discussion in precedent Chapter 2 and Chapter 3 for more details.

[371] An implicit assumption of the static tradeoff models of capital structure is that adjusting a bank's capital structure is costless.

[372] Diseconomies of scale exist if an increase in volume results in an increase in average unit cost. Deadweight costs of bankruptcy arise solely because of the insolvency and provide no social value. An example of a deadweight cost would be the legal costs arising from a bank's failure.

[373] Inherent to the increased uncertainty about the ability to honor all claims on the bank's cash flow stream, in addition to larger agency costs incurred in controlling the conflicts of interest between shareholders and creditors.

Part of financial distress costs is borne by the bank's creditors and part by shareholders. To the extent that creditors can foresee, at the time the debt is issued, the likelihood of these costs, they will raise their required rates of return and shift the entire expected costs of financial distress to shareholders under risk neutrality. In response, shareholders may choose to reduce these expected costs by increasing the capital ratio of the bank to the point at which the reduction in the expected costs of financial distress just offsets the reduction in the tax benefits of debt. In effect, market capital 'requirements' increase in response to a rise in the expected costs of financial distress.

Depository institutions are vulnerable to an idiosyncratic financial distress cost stemming from their deposit-taking activity. The emergence of financial distress in a depository institution is likely to cause a loss of confidence in the solvency of the bank. In such an environment, depositors might well exercise the *put* option embedded in their deposit contract, which gives them the right to withdraw funds instantly or at short notice. This action will increase the bank's exposure to liquidity risk enhancing the probability of bankruptcy, particularly, in less favorable states of nature.[374] From this perspective a bank's capital structure may reveal potentially adverse financial liquidity problems.

It has been suggested by a number of authors that the presence of publicly insured deposits grants a bank's equityholders an incentive to take on excessive risk leading to an increase in the bank's probability of bankruptcy. Such managerial risk-taking behavior would imply significant erosion in the bank's value as a *going concern*[375] because, at least partly, of the potential for moral hazard behavior (e.g., Demsetz, Saidenberg and Strahan 1997).

Saunders (1998, 379) provides evidence on a sample of 1049 U.S. banks that failed during the 1987 to 1992 period. The total estimated losses supported by the Federal Deposit Insurance Corporation's (FDIC) average 14 percent losses-to-assets rate. We interpret this result as an estimate of direct costs of bankruptcy. James (1991) provides evidence on the economic losses occurred in bank failures in the U.S. from 1985 to mid 1988. He estimates that, on average, the loss of the (book) value of failed banks' total

[374] This characteristic is, under certain banking regimes, potentially restricted by the presence of (often-subsidized) financial assistance mechanisms — the so-called *safety net*.

[375] For Hawkins (1986) argues that the concept of *going concern* "places emphasis on the continuity and whole process of business activity."

assets is 30 percent.[376] Indirect bankruptcy costs, in turn, encompass a "wide range of unobservable opportunity costs" (Weiss 1990) and tend to be higher than the bankruptcy costs reported for non-financial firms by Weiss (ibid.).[377]

Hannan and Hancock (1988) estimated a 0.35 percent average probability of insolvency for a 12-month period using survey data for a sample of approximately 300 U.S. banks, collected during the first quarter of 1985. The authors found a positive relationship between banks' uninsured deposit interest rates (or the spread over the risk-free rate) and the level risk of banks' riskiness. Further they find that "the risk of insolvency (and hence default) determines the premium over the risk-free rate that banks must offer CD purchasers."[378]

A significant source of bankruptcy costs is the loss of both *franchise*[379] and *charter*[380] value (e.g., Milne and Whalley 1998; Saunders and Wilson 1997b). In a world with market frictions and imperfections, such as transaction costs, informational asymmetry and agency conflicts, there are incentives for banking firms to develop *reputational capital*, also called *goodwill* (Greenbaum and Thakor 1995, 85). Charter value, franchise value and reputational capital will be, partly or totally, lost "in the event of insolvency or substantial increase in financial distress"

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[376] The author measure the losses incurred in bank's failure "as the difference between the book value of the assets and the recovery value net of the direct expenses associated with the failure" (James 1991, 1223).

[377] The empirical evidence provided by Weiss (1990) on direct bankruptcy costs is estimated under the 1979 Bankruptcy Code framework. The author measures financial leverage as the quotient between book value of debt and the market value of equity. In the evidence reported by Saunders (1998) direct bankruptcy costs are measured against the book value of total assets. Using Barth and Brumbaugh (1994, table 1) data we estimate average failure costs (a proxy for direct costs of bankruptcy) of U.S. failed banks during the 1980 to 1992 period as 19.93 percent, and 14.43 percent in terms of weighted average by failure assets.

[378] The authors estimated a perceived likelihood of bankruptcy, p, for each bank in their sample. Assuming the trivial presumption that insolvency occurs when actual losses depletes equity capital, p is estimated as being equivalent to the probability that $NI / A < - K / A$, where NI stands for net income, A for total assets, and K for equity capital. Further assuming that $[E (NI / A) + K / A] / \sigma$, "represents the number of standard deviations between the expected value of return of assets, $E (NI / A)$, and that negative values of NI / A, $NI / A < - K / A$, which would result in insolvency, where σ represents the standard deviation of the return to assets." "It follows from Chebyshev's inequality that for any symmetrical distribution, the probability of insolvency, p, will be such that $p \leq (1/2) \sigma^2 / [E(NI / A) + K / A]^2$, where the "1/2" in this expression reflects the fact that insolvency occurs only in one tail of the distribution."

[379] Franchise value may be interpreted as the long-run value of the banking firm as an ongoing concern. According to Demsetz, Saidenberg, and Strahan (1996) the sources of franchise value in banking include "[…] efficiency, access to markets protected from competition, and valuable lending relationships."

[380] Because in banking there are barriers to entry in the form of limitations to the establishment of new ventures "a banks' charter, which gives the right to do business as a bank, is by far its most important intangible asset" (Sinkey 1998, 862).

(Harker and Zenios 1998, 7). Therefore, as suggested Saunders and Wilson (1997b), among others, higher charter value banks should have the incentive to over capitalize their balance sheet as a protective strategy against costly insolvency.[381]

Banks like other firms typically retain a fraction of their earnings. Thus, *ceteris paribus*, more profitable banks will therefore show higher levels of retained earnings, and consequently higher equity capital, which provides a cushion against losses, lowering bankruptcy costs. In the presence of imperfect capital markets, a bank with more capital and lower bankruptcy costs is also likely to have a lower cost of capital and therefore a higher market valuation.

3.3.2. *Agency Problems in the Banking Firm's Capital Structure Decision*

Conflicts of interest among claimholders emerge indifferently in contractual arrangements of both banks and non-banking firms. However, the nature of these agency problems is arguably distinct in the two types of firms. *Traditional* agency conflicts include the incentive and behavioral problems of shareholders, managers, and debtholders. In banking, however, other groups of claimholders — such as insured depositors, regulators and taxpayers — also matter in assessing agency problems.[382] Plausibly, certain characteristics of banking environments yield peculiar kinds of agency relationships. These bank-specific agency relationships are likely to exhibit a complex and intricate structure due to the extended array of variants of principal-agent arrangements that are possible within the *nexus* of banking contracts. These banking idiosyncratic agency problems may also be much more subtle and difficult to fully understand because of the presence of overlapping and crossover effects of factors, such as the discipline of capital regulation and the incentives provided by deposit insurance mechanisms.

As noted earlier (chapter 2) the typical ownership structure of contemporary (large) corporations — as it is arguably the case of banks — implies that residual claims and control rights are separated. This creates the conditions for conflicts of interest between owners and managers, resulting in the misalignment of their objective functions.[383] In this

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[381] Demsetz, Saidenberg, and Strahan (1996) explored the relationship between franchise value and risk taking over the 1986-94 period. Their findings suggest that "banks with more franchise value hold more capital and have less asset risk than banks with less franchise value."

[382] See, among others, Filbeck and Mullineaux (1999), Demsetz, Saidenberg and Strahan (1997), Davis (1995), Scroggins, Fielding and Clark (1995), Barth and Brumbaugh (1994), and Arshadi (1989).

[383] As argued by Rappaport (1986, 6) this problem "is exacerbated in large corporations where is difficult to identify the interests of a diverse set of stockholders ranging from institutional investors to individuals with small holdings. Since the

setting it is widely acknowledged that agency problems are likely to arise, partly, because managers tend to, self-interestedly, pursue their own interest, which are not necessarily identical to those of shareholders.[384] Two possible (and related) explanations for this managerial behavior are (1) the undiversified nature of managers' human capital (specific) investment,[385] and (2) their informational advantage regarding bank's future performance and growth prospects, and therefore the bank's *true* market valuation.[386]

In summary, we find that the presence of costly agency problems in banking habitats is a well-established fact in this literature (e.g., Wall and Peterson 1998; Flannery 1994). In this framework, we may hypothesize that these problems are a potentially relevant factor in the determination of a bank's capital structure. More specifically, we may conjecture that managerial discretion behavior, such as the preference for risk aversion, might be also influential in the capital structure decision-making of banks (e.g., Wall and Peterson 1998, 8; Hughes and Mester 1994; and Shrieves and Dahl 1992).

3.3.2.1. The Nature of the Agency Problem in Banking

As seen earlier, banking firms are not immune to the agency costs entangled in conflicts of interest resulting from divergences in claimholders' objective functions and the propensity for opportunistic behavior.

Besides the *traditional* forms of moral hazard, in banking this kind of opportunistic behavior may also emerge from contracting relationships between banks and borrowers, banks and depositors, and banks and providers of public deposit insurance (e.g., Boyd, Chang and Smith 1998, Kareken and Wallace 1978, and Merton 1978).[387] In a banking system where banks are not allowed to owning equity stakes in non-financial firms,[388] it is shown that the bank will act to control the moral hazard problem between itself and

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ownership of shares in large corporations tends to be diffused, individual shareholders are said to have neither influence on nor interest in corporate governance issues […]."

[384] Thomson (1994) argues that "[…] to understand the objectives of bank management one must first understand the incentives they [managers] face."

[385] See, e.g., Friend and Hasbrouk (1988, 2) who characterize managerial risky investment in the firm as "[…] reflecting both holdings of marketable securities and firm-specific human capital, is both large and largely nondiversifiable."

[386] Seitz (1982) observes that "[t]here are two bodies of theory that are based on the assumption that the interests of managers and shareholders do not automatically coincide, that information is not free, and that both parties will attempt to maximize their own self interest when contracting with each other. These are agency theory and signaling theory."

[387] It has been argued that in a *universal banking* framework governmental safety net far might extend the too broadly, exacerbating moral hazard problems and therefore they could, potentially, spillover beyond the financial sector (e.g., Corrigan 1983, 1987, and Saunders 1994).

debtors.[389] Since the active control of this problem lowers the bank's probability of bankruptcy, on average, its assets would be more valuable in future bankruptcy states. This behavior would also be beneficial for the public deposit insurer by limiting the present value of its future liability implicit in the deposit insurance contract. However, when a bank is allowed to be simultaneously a creditor and a residual claimant on the same firm, its incentives to control moral hazard problems are likely to be substantially reduced.[390]

Banking institutions are, by their very nature, 'opaque' institutions essentially because of imperfections on the information that flows among managers, investors, regulators, depositors, and borrowers (e.g., Ross 1989).[391] Although banks generate considerable amounts of information as part of their *production technology* process, that information is not readily available to outside investors and public deposit insurer. Further, information produced in decision-making and in other activities is not disclosed to claimholders because, among other things, concerns with confidentiality (e.g., Campbell 1979). In these instances, incentive conflicts arising in agency relationships can be expected to play an important role in determining contractual relationships among claimholders.[392, 393]

Under efficient capital markets assumption, a value-maximizing bank wishing to increase its own riskiness — either by undertaking unprofitable investment projects and/or leveraging-up its capital structure — would be required to offer a higher expected return to its claimholders. Consequently, as argued by, e.g., Karels and McClatchey (1999) and Flannery (1994a), depositors and other creditors of such a bank would attempt to control

[388] Therefore preclude from being simultaneously a creditor and a residual claimant on the same firm.
[389] For a contrasting view see Santos (1999a), Kim (1992) and Pozdena (1991).
[390] This may vary according to the specificity of national models of governance.
[391] This immanent characteristic of the banking firm represents one of its *raison d'être* and helps to explain, at least partly, why financial intermediation is a profitable activity.
[392] As previously explained, agency problems arise in circumstances where decision-making responsibility (and therefore, control over resources) is, either explicitly or implicitly, delegated by a principal to an agent, in settings where (1) objectives among claimholders may diverge, and (2) full information enabling control to be exerted is not readily available. In this setting incentives of the principal and agent are likely to be misaligned, and the principal is unable to assess, accurately, the agent's actions and exert control. Therefore, the potential for wealth transfers between principal and agent is material. Because of this potential wealth transfers, significant costs may be incurred in designing, monitoring and enforcing contracts between agent and principal to prevent such transfers.
[393] Diamond (1996, 1984), for example, characterizes a banks as a delegated monitor arguing that its role as financial intermediaries involves assuming responsibility as a *delegated principal* in monitoring borrowers. This analysis only looks to a particular subset of the agency problem set in financial institutions.

the risk-taking behavior of its owners by demanding a higher return on their claims.[394] Thus, c*eteris paribus*, the higher the incentives for equityholders to transfer wealth for its own benefit at debtholders expense, the lower should be the bank's level of financial leverage (and higher its capital ratio). Thus if, as suggested in the literature, banks are known for exhibiting some of the lowest capital-to-assets ratios than, arguably, these two agency problems might be acute in the banking industry.

3.3.2.2. The Shareholders – Managers' Agency Problem in Banking

In banking, agency conflicts stemming from shareholders – managers' relationships are of the same nature as the ones emerging in a non-banking firm. In essence, the lack of appropriate monitoring and discipline by shareholders may exert managers to pursue their own objectives to the detriment of those of shareholders.

The shareholder-manager agency problem is a consequence of the managerial preference for (1) low effort levels and propensity for high personal consumption of bank's resources; (2) low risk investment policies and low levels of financial leverage (to reduce the probability of bankruptcy);[395] (3) short-term maturity investments, and (4) reduced probability of losing a job either by opposing increased leverage and / or fighting against hostile propositions of change in control.

When a bank's ownership structure is diffuse and managers have only symbolic equity holdings,[396] bank's owners — because of the separation between ownership and control — need to provide the appropriate incentives to induce managers to maximize owners' wealth. But because bank owners only possess an imperfect control of managerial decision-making, it might be advantageous for them to incur in expensive contracting and

[394] As noted by Karels and McClatchey (1999) "[e]xcessive asset or leverage risk results in a higher cost of borrowing which, in turn, discourages further risk-taking by reducing the profitability of such actions." This raise in borrowing costs might well arise, for example, due to an increase in the bank's liquidity risk caused by depositors withdrawing their funds. In this instance, the bank will have to attract new depositors — in order to offset lost deposits and avoid liquidation or receivership — and offer commensurately higher interest rates.

[395] Thomson (1994) suggests that "[…] bank capital structure decisions are not independent of risk-preference of managers."

[396] Both, Jensen and Meckling's (1976) agency theory and Leland and Pyle's (1977) signaling theory, made the prediction that managers stock's ownership is positively related to firm market value. However, it is not warranted that by increasing the bank's managers fractional equity stakes the potential misalignment in risk-return preferences of the bank's managers and equityholders is eliminated, because managers are not, typically, so well-diversified as outside equityholders. In this setting, leverage-upward pure capital structure decisions (taking the asset-base as invariant) increases managers ownership holdings and therefore lower outside equityholders agency costs.

monitoring arrangements and thereby obtain a better alignment between theirs' and managers' interests.[397]

As suggested by Gorton and Rosen (1995) the shareholder - manager problem provides a basis for explaining the increased risk-taking by banks in the U.S. during the 1980s. In their model, bank managers faced with declining prospects for future profits, increased portfolio risk as a way of concealing poor prospects from shareholders. More typically, this agency conflict is characterized by excessively *risk averse behavior* on the part of the manager, who may pursue his own objective function at the expense of better-diversified shareholders. This manifestation of the shareholders - managers agency problem may nonetheless be helpful in mitigating moral hazard behavior and in promoting the alignment between the interests of (risk-averse) bank managers and those of bank regulators.[398]

As previously discussed (see Chapter 2), an array of control mechanisms to remedy agency problems is available in the banking environment. These included (1) the corporate law as a means of efficient contracting; (2) the governance structure as a means of mitigating management-incentive anomalies; (3) capital market discipline; (4) the discipline of managerial labor market; and (5) signaling and financial intermediation activities as a means of mitigating asymmetries of information.

The disciplinary role of financial leverage is a well-known implication of Michael Jensen's *free cash flow hypothesis*.[399] When free cash flow is large and corporate control transactions are absent, managerial discretion might lead to *overinvestment*, creating a conflict between managers and equityholders whose wealth maximization, in these instances would be neglected. The crux of the free cash flow argument is committing the management team to cash flow payments to owners rather than allowing them to take on unnecessary and inefficient risk. One effective way to achieve this goal is by directing managers to stock buyback transactions. Share repurchases are, in contrast to dividend payouts,[400] a very credible means of returning *excess* cash to investors because funds are

[397] Recently Besanko and Kanatas (1996) have shown that a bank's managerial stockholdings is related to its voluntary and involuntary security offerings. Their numerical solutions are consistent with the empirical findings of Cornett and Tehranian (1994) concerning the impact in banks' stock price of new external equity offerings' announcements. Results also suggest that insiders' ownership holdings are inversely related to the magnitude of the share price decline.
[398] See Demsetz, Seidenberg, and Strahan (1997).
[399] See Jensen (1986).
[400] With the obvious exception of the so-called *specially designated dividends*.

distributed immediately (and transparently), often enjoying a more favorable tax treatment.[401]

Another mechanism to mitigate shareholder - manager agency conflicts is by increasing financial leverage.[402] When principals can only imperfectly monitor agents' decision-making, it has been shown that taking on more debt provides appropriate incentives for managers, to avoid excessive perquisite consumption, to exert adequate effort, and to make optimal investment decisions. The reason is that higher leverage puts pressure on managers to generate cash flows to adequately servicing the debt thus avoiding bankruptcy which adversely affects the value of their human capital (Jensen 1986; Grossman and Hart 1982; and Jensen and Meckling 1976). Additionally, shareholders may include residual claims holdings in managers' compensation schemes, the relative value of that equity ownership may be enhanced by increased leverage, further heightening their incentives. Moreover, leveraging-up reduces the scope for managers to avoid liquidation when this is optimal for shareholders (Harris and Raviv 1990).

Saunders, Strock, and Travlos (1990) examine the relationship between management ownership and risk taking in large U.S. banks during the 1978-1985 period, and observe that stockholder-controlled banks (with high managerial equity positions) exhibit greater risk-taking behavior than manager-controlled banks (with low managerial equity positions). This result suggests that the former banks have incentive to take on more risk than the latter.

Gorton and Rosen (1995) note that managerial entrenchment may arise even when managers hold a small fraction of the bank's equity. This might occur if they succeed in amassing sufficient voting power to defeat attempts to remove them from office. Under this *corporate control hypothesis*, banks with entrenched managers are expected to engage in inefficient risk-taking. Conversely, if managers have large stock holdings and, hence, considerable personal wealth at stake, they will prefer an efficient risk-taking behavior, as predicted by Jensen and Meckling (1976).

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[401] Although the presence of unique regulatory capital adequacy requirements might affect banks' share buybacks differently from firms not experiencing regulatory capital constraints, it seems that stock repurchases by banks "result in a positive and significant valuation effect for the repurchasing banks" (Akhigbe and Madura 1999). Because large stock repurchases affect significantly regulatory capital — eventually threatening banks ability to meet capital adequacy standards — banks are not allowed to engage in such transactions without receiving an *ex ante* approval.

Managerial discretion give management the opportunity to manipulate the bank's accounts in order to mask the deterioration in its financial condition. Delay in recognizing loan losses or anticipating gains from trading are examples of such practices (Carey 1993). Given that these cosmetic operation smooth earnings, they are likely to influence the level of a bank's capital ratio through retained earnings. This problem becomes more troublesome when there are barriers to assess the *true* economic condition of a bank, such as when its accounting is not *marked-to-market*.[403] Carrying bank's transaction at their historical value may result in unrecognized losses that may turn bank's economic net worth negative even when accounting records portray a more favorable situation.

3.3.2.2.1. Corporate Control in Banking

Among the various devices outside investors have at their disposal to exert discipline over a bank's insiders, the market for corporate control is of particular importance. Corporate control transactions facilitate the concentration of ownership (gathering into one or more bundles fragmented share ownership) and thus are helpful in improving owners' effective control over a bank's resources and also in reducing managerial discretionary over decision-making. The threats of a corporate control transaction, such as a hostile takeover bid, in the banking industry are presumably less effective in disciplining managerial behavior than in non-banking firms. The presence of institutional constraints to bank's corporate control transactions make these operations less frequent in banking, thus explaining the differences between the two sector of economic activity in that respect (see, e.g., Prowse 1997).[404, 405] This suggests that the structure of the banking corporate control market may incorporate special features.

In contrast to the market for corporate control of non-banking firms, the regulatory interference in the banking market is likely to undermine its importance and efficacy as a mechanism to discipline managers. In this framework, capital structure decisions are likely

[402] Regulators may also be concerned about the incentives shareholders provide managers. John et al (1995) argue below that a deposit insurance premium that reflects both leverage and the structure of management compensation can lead banks to choose risk in accordance with regulators preferences.

[403] See, e.g., Mondschean (1996) for a review of the problems associated with the adoption of marked-to-market accounting in commercial banking.

[404] For example Hadlock, Houston and Ryngaert (1999) emphasize that "in non-bank acquisitions a hostile takeover is a more likely possibility than it is in banking."

[405] Common restrictions are on prospective acquirers damaging the credibility of takeover threats. Corporate control transactions between banks and non-banks are also restricted, as ownership of banks by non-financial corporations. Whenever permitted hostile takeovers in banking industry are required prior approval by supervisory and regulatory authorities besides being, normally, more time consuming and more expensive.

to play a diminished role in comparison to the role they play in the market for corporate control of non-financial firms.[406] However, it must be acknowledged that actual corporate control transactions in banking may influence capital structure decision-making when capital adequacy requirements are binding.[407]

An interesting empirical result reported by Hadlock, Houston and Ryngaert (1999) suggests that "banks with higher levels of management ownership are less likely to be acquired." This evidence seems consistent with the view that in banking systems characterized by concentrated ownership structures the market for corporate control may be less active. Schranz (1993) indicates that banks operating in active takeover markets are more profitable than those operating in markets where takeovers are restricted. Further, banks operating in these restricted banking markets make greater use of alternative methods for providing managers with the incentive to maximize firm value, such as increased managerial equity holdings.[408] Lastly, Brickley and James (1987) provide evidence supporting the *substitute hypothesis*, that is, the market for takeovers and the board of directors are substitute mechanisms for controlling managerial behavior.

3.3.2.3. The Shareholders – Debtholders' Agency Problem in Banking

Conflicts of interest between shareholders and debtholders lead to suboptimal investment, financing and dividend policies. These conflicts emerge when equityholders in control of a bank's decision-making have the incentive to transfer wealth to themselves at the expense of less well-informed debtholders.[409] The most emblematic manifestations of this kind of opportunistic behavior include: *risk shifting*[410] either via *claim dilution* (excessive dividend payouts or increased leverage), or *asset substitution* (opportunistic substitution of less risky assets for riskier ones, eventually, undertaking negative net present value investment); and *underinvestment* (rejection of positive net present value

Gorton (1992) suggests that the difficulty potential acquirers might have in valuing portfolios of opaque and illiquid assets is an additional obstacle to hostile acquisitions in banking.

[406] See chapter 2 for further details.

[407] See in this Chapter the discussion about the effect of accounting rules of goodwill involved in acquisitions on bank's compliance with regulatory capital norms.

[408] Higher levels of concentration in ownership are also helpful in aligning managers with the objective of maximizing owners' welfare via the disciplinary role of block shareholders.

[409] As posited by Osterberg and Thomson (1989, 11) "[…] as Jensen and Meckling (1976) argue, conflicts arise between stockholders and bondholders that cause total bank value maximization and equity value maximization to differ."

[410] Empirical evidence provided by Esty (1997) illustrates a case of risk shifting behavior in the U.S. 'Savings and Loans' industry during the 1983 to 1988 period. See also John, John and Senbet (1991).

investment opportunities) (see, e.g., Galai and Masulis 1976).[411] Additionally, equityholders may avoid taking socially desirable actions which could benefit current debtholders because they might adversely affect their own wealth.

Since the landmark contribution of Black and Scholes (1973), it is well established that the value of residual claims can be conceptualized as a *call option* on the value of the bank with an exercise price similar to the face value of the bank's debt. In this framework, equityholders' wealth is positively affected by the adoption of riskier policies just as the value of a call option is raised when the volatility of the underlying asset increases.[412] Since debtholders (and depositors) can only monitor equityholders' actions imperfectly, equityholders can increase the value of their option by increasing the risk of the bank's underlying assets (e.g., Saunders, Strock and Travlos 1990).[413] Value-maximizing shareholders will, therefore, design insiders' incentive contracting in order to induce them to behave according to the shareholders' risk preferences[414] by adopting higher risk-return projects and increasing leverage to fund them.[415] If projects turn out highly profitable, debtholders (and depositors) with a fixed contractual payoff, will not share the project *upside* with shareholders. However, if the project ends up being unprofitable, debtholders (and depositors) might not be paid in full, ending up (implicitly) sharing the project's *downside* risk. This behavior leads to a reduction in the risk-adjusted value of debtholders' (and depositors') claims on the bank to decrease, creating a wealth transfer to shareholders at creditors' expense.[416]

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[411] Galai and Masulis (1976) argue that "[w]hen firms have outstanding debt, however, managerial efforts to maximize shareholders' value will not necessarily maximize the firm's total value. Debt financing creates an opportunity for equityholders to extract wealth from debtholders, either by increasing leverage or by substituting riskier assets for those which had existed when debt was first issued."

[412] The incentive for this behavior is, in general, associated to financial leverage and to the size of the firm's growth opportunity set.

[413] This effect is cited in the literature as the *wealth transfer effect*.

[414] As pointed out by Flannery (1994a) a "levered firm's managers and equityholders have private incentives to pursue suboptimal investment and risk strategies."

[415] Osterberg and Thomson (1989) indicate that "[w]hile banks in some ways may be different from other firms, banks' incentives to engage in risky behavior are in some ways similar to the incentives of nonfinancial corporations." A similar view is suggested by Simpson and Gleason (1999) who argue that the"[…] incentives for risk-shifting from equity owners to depositors exist in banking similar to the agency problem caused by the conflict between owners and debt-holders in other corporations."

[416] The transfer occurs whenever the reduction in the value of the bank is inferior to the reduction in the value of depositors' claims.

It has been noted that escalating the use of debt financing in the bank's capital structure is likely to affect the behavior of claimholders.[417] Therefore, such decisions become relevant for the bank's market valuation because of the allocation of control rights among its claimants and the incentives for outsiders to exert control over the bank's assets. This external intervention is more likely in adverse macro conditions and in cases of poor performance. However, its credibility is contingent on the likelihood of the control rights over the bank's assets being transferred from insiders to creditors in an insolvency state.

As suggested by Myers (1977), in financial distress shareholders lack the incentive to allocate new equity capital even to finance investment projects with an expected positive net present value, since most of the benefits would accrue to debtholders. Moreover, shareholders may have the incentive to continue the bank's operations beyond the point at which it should be liquidated in order to at least maintain an option value for their claims.

A rational and risk neutral debtholder will require a commensurate return (in the form of a higher credit risk premium) for the present value of such expected expropriations of its claims. To signal debtholders the bank financial condition, and the alignment in the objective functions of both shareholders and debtholders (and the unlikelihood of engaging in future wealth expropriation behavior), owners may optimally increase the bank capital ratio. In this framework agency problems between shareholders and debtholders do raise market capital 'requirements'.

Problems of expropriation of debtholders' wealth may be magnified if the debt has a long maturity and is difficult to be redeemed in the short term. This is because shareholders are more likely to expropriate value if there is more time before creditors can react by raising rates or withdrawing credit (Flannery 1994).

3.3.2.4. The Shareholders – Depositors' Agency Problem in Banking

Agency conflicts arising between shareholders and depositors and between shareholders and regulators are probably the most peculiar in banking. Among the variety of agency problems that have been emphasized in this literature, is the incentive to increase risk and therefore expropriate debtholders' wealth, provided to residual claimants by the *limited liability* mechanism. Since some of the governmental *safety net* mechanisms shield debtholders' wealth (in particular, depositors) against the consequences of bank insiders'

[417] If ownership rights of claimants on bank's future cash flow stream are instrumental for their behavior, then they configure incentive system for their holders.

risk-taking, depositors' incentive to monitor and control risk-taking is severely limited.[418] In the absence of such monitoring it is known that moral hazard behavior might emerge.[419] When regulatory deposit insurance is absent then the agency problem between depositors and shareholders reverts to the classical conflict between residual claimants and creditors, which was discussed in the previous subsection.

Yet we should recognize that the deposit contract might be seen as depositors granting shareholders a *put option* over the assets of the bank. Shareholders have an incentive to increase the value of that option by increasing the risk of the institution, either by increasing the leverage, or by investing in riskier asset portfolios (e.g., Gilbert 1990).[420]

A fixed-premium deposit insurance regime (invariant to financial and asset risks)[421] creates a put option to bank owners and also encourages the assumption of higher — and potentially inefficient — risk to maximize the value of their put-option subsidy on deposit insurance (e.g., Barth and Brumbaugh 1994; Marcus and Shaked 1984; Merton 1977).[422] If the incentives for imprudent risk-taking activities result in economic losses that are ultimately passed on to the deposit insurer, a moral hazard problem arises.

Furthermore, in a framework characterized by the simultaneous presence of outstanding debt financing and *limited liability*,[423] equityholders have further incentives for taking on inefficient risk.[424] The individual (insured) depositor, however, because of the

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[418] Lucas and McDonald (1992) posit that "risk taking by banks is often attributed to moral hazard induced by non-risk-based deposit insurance, coupled with regulator inability to monitor bank risk"

[419] The crisis of the 'Savings and Loans' institutions in the 1980s in the U.S. has been frequently attributed to moral hazard problem associated with public deposit insurance (e.g., Barth 1991; White 1991; and Kane 1988). For a review of the deposit insurance literature see, among others, Kane (1995).

[420] Agency problems between managers and shareholders can be lowered as the owners' incentive to increase the value of their put option, aligns with the managers' interest to avoid eroding the value of their human capital and to maintain the private rents inherent to control. As suggested by Barth and Brumbaugh (1994), the threat of a severe regulatory intervention might well determine an alignment in managers and owners' preference for excessive risk-taking. This problem is examined theoretically in Fluck (1999a).

[421] As it was the case in the U.S. before the implementation of the Federal Deposit Insurance Corporation Improvement Act (FDICIA) of 1991.

[422] According to Barth and Brumbaugh (1994, 76) "[…] insured depositors are indifferent to the risk of the assets that are acquired with their funds. Protected against losses by deposit insurance, they have no incentive to impose discipline upon the owners and managers of their depositaries."

[423] The feature of the limited liability, present in the prevalent firm organizational form in the banking industry, prevents equity to be negative, although it does not cap its potential to grow infinitely. However, as it is well documented in the literature, shareholders of limited-liability banks financed by (either insured or uninsured) deposits have incentives to take risk beyond that which is optimal for an 'all equity' bank (e.g., Kose, Saunders and Senbet 1998, and John, John and Senbet 1991).

[424] John, John and Senbet (1991) argue that incentives risk-shifting in depository financial institutions are provided by the presence of limited liability for owners, and the convexity associated to the payoff of limited liability levered equity.

smallness of his fractional claim on the bank and because of the public insurer's guarantees, is unable (and/or unwilling) to exert an effective influence on bank's insiders decision-making or in monitoring their decisional behavior.[425] Hence, modifications in the riskiness of the bank's asset portfolio — such as increasing the variance of its return — and in the bank's financial risk affects positively the likelihood of financial distress and insolvency becoming a source of potential wealth transfers between equityholders and debtholders and depositors.[426] Therefore shareholders have an additional incentive to encourage managerial discretionary action to promote their welfare at debtholders' expense.[427]

Plausibly, because of their *specialness*, banks benefit from the protection of a governmental *safety net*, from which they enjoy preventative financial assistance. Among the different mechanisms included in the safety net, deposit insurance is one of the most prominent. As is widely accepted, the presence of this government guarantee creates a well-known moral hazard problem in the form of an incentive for excessive risk-taking, whereas depositors have little or no incentive to monitor the bank (e.g., Mishkin 1999).

An element that plays a particularly important role in lessening the moral hazard problem associated with the governmental safety net is the bank *franchise value*.[428] The safety net provides a cushion to a bank's creditors which protect them from economic losses. However, this protection creates a moral hazard problem by limiting their incentive to control risk-taking. Insured depositors have little (or no) motivation to restrain riskiness by requiring a return commensurate with the bank's risk level or by withdrawing their deposits when the bank becomes riskier. To avoid losses in franchise value, the bank owners might be motivated to adopt less risky business strategies. This leads to a better

[425] The propensity for banks' insiders to behave in a moral hazard fashion it is widely accepted view, however, other authors claim that such behavior was already present prior to the inception of deposit insurance system (Greenbaum and Thakor 1995, 454; Calomiris and Khan 1991, 499).

[426] Because part of (insured and uninsured] depositors' payoff includes liability services (see, e.g., Diamond 1996) provided by the depository institution, any increment in its probability of insolvency reflects in a diminished expected return if the bank enters in financial distress and ultimately in undesirable liquidation.

[427] As noted by Esty (1997) for U.S. subordinated (uninsured) debtholders, typically, contribute with hold only a fractional amount of banks' liabilities. Hence, it is not unlikely that these claimants provided credible discipline against bank management risk-taking.

[428] Demsetz, Saidenberg, and Strahan (1996) conceptualize franchise value as "the present value of the stream of profits that a firm is expected to earn as a going concern." Further they suggest that the sources of franchise value include "[…] efficiency, access to markets protected from competition, and valuable lending relationships." Acharya (1996), Keeley (1990), and Marcus (1984) show formally how franchise value can mitigate moral hazard problems in banking.

alignment between bank's equityholders interests and those of the deposit insurer and supervisory authority. In this sense the reluctance to incur in losses of franchise value becomes, therefore, a useful instrument to ameliorate the moral hazard problem in banking.[429]

A particular feature of banking firms is the fact that their liabilities are, to a large extent, held by (small) depositors and other financial institutions. Small — insured or uninsured — depositors do not have either the incentive or the skills to secure and process the information needed to assess a bank's riskiness, creating a potentially severe *free-riding* problem.[430] Because small depositors are unable to appropriate control rights that would enable an external intervention, their reaction to poor performance and increased risk is limited to withdrawing their deposits if the bank is taking on too much risk. For these reasons small depositors need a public or private agent to try to mitigate the costs associated with the conflict of interests between bank owners and depositors. Regulatory and supervisory authorities are though engaged in just such an agency relationship as depositors' agents.

A similar, although more acute, problem occurs in banking environments where public deposit insurance is priced insensitively to asset risk. Banks' equityholders are provided with a distortionary incentive to increase banks' asset riskiness. In this case, the banking firm is tempted to leverage-up because of the advantageous cost of deposit funding due to the subsidy granted by public deposit insurers at taxpayers' expense.[431] Shareholders, instead of using their own financing or resorting to risk sensitive debt-financing to fund incremental asset growth, are thus very likely to resort to such deposit financing, hence reducing the capital ratio and further increasing the probability of potentially disruptive and costly insolvency.

The shareholder - depositor agency problem might be exacerbated because the intrinsic nature of the deposit contract which precludes the application of priority rules to deposit claims, such as, *existing deposits* over *future deposits*. Diluting deposit claims through increased leverage creates a problem (because new deposits are equally ranked

[429] Brewer and Saidenberg (1996) provide an examination of the impact of franchise value and agency conflicts in mitigating risk-taking by U.S. 'Savings and Loans' institutions.

[430] As argued by Freixas and Rochet (1997, 17) "monitoring typically involves increased returns to scale."

[431] Prowse (1997) suggest that banks (insured) debt issuance provide "strong oligopolistic advantages on the liabilities side of their business."

with old ones) which resembles, for example, the problems of increased leverage, excessive dividend payouts or asset substitution.[432] This potential problem is also of significant importance for uninsured depositors who do not benefit from the protection of the governmental safety net. To mitigate this (shareholders – depositors) agency problem, one might think of individual depositors disciplining shareholders by liquidating their investments (withdrawing their deposits) if managerial actions were perceived as damaging to their wealth.[433]

It has already been noted that governmental intervention in deposit markets to ensure protection to depositors against banks' opportunistic risk-taking[434] can be accomplished by guaranteeing or insuring (with either flat or risk-based pricing) depositors' claims.[435] However, this action, grants banks' owners a 'free' put option on the assets of the bank, enabling them to honour deposit obligations under all circumstances and 'transforming' deposits into risk free assets.[436] To overcome the agency problem between bank owners and regulators, the latter attempts to constrain and control owners' incentive to increase the value of the put option — and hence to exercise moral hazard — granted to them by deposit insurance[437] (or other form of implicit guaranty to depositors' claims). The *regulatory burden* over bank owners includes the imposition of restrictive limits on operations and by on-site and remote scrutiny.

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[432] Problems may well be exacerbated since deposit claims are not traded in (organized and competitive) secondary markets where prices reflect the informational effects of such actions. As observed by Greenbaum and Thakor (1995, 453) "the fact that […] deposits are not traded in a secondary market implies that the depositor's payoff does not depend directly on how information about the bank is processed by other market participants[…]." This lack of market pricing discipline exacerbates the intrinsic moral hazard problem of the deposit contract, irrespective of its insured or uninsured nature.

[433] The so-called 'first come, first served' rule reflects the *callable* nature intrinsic to a bank deposit contract. Two major difficulties may appear. First, the possibility of 'bank runs' emerging (e.g., Diamond and Dybvig 1983). Second the presumption that all depositors are well informed about the bank's riskiness. Although the 'first come, first served' rule might well increase the incentives for monitoring, differential distribution of information among depositors is possible, and in this setting agency costs may be borne, disproportionately, by the more poorly informed depositors.

[434] Prudential supervision aims at limiting the liability incurred by both the insurer and the guarantor.

[435] Even with risk-adjusted deposit insurance pricing, incentives for risk-shifting will still be present. Hence, the propensity for excessive risk-taking can not be exclusively attributed to risk-insensitive deposit insurance pricing (John, John and Senbet (1991).

[436] Alternatively, government protection can be interpreted as the government granting a put option to depositors, which offsets the put option granted by depositors to the bank owners, and thus removes their incentive to monitor bank actions.

[437] Merton (1977) shows that the government deposits guarantee can be viewed as a put option for banks on the government.

3.3.2.5. The Taxpayers – Regulators' Agency Problem in Banking

Arguably, there is also a moral hazard problem emerging out of the agency relationship between taxpayers and governmental entities, such as public deposit insurer officials and other regulators (e.g., Barth and Brumbaugh 1994). It is acknowledged in the banking literature taxpayers are clearly dispersed, and consequently have neither the incentive, nor the ability, to monitor government officials — specially regulators — and ensuring they are acting in taxpayers' interest. Timely regulatory intervention to either curbe excessive risk-taking strategies or impose recapitalizations are example of effective ways of minimizing deposit insurance payments and therefore protecting taxpayer interests. U.S. empirical evidence provided by Barth and Brumbaugh (1994) related to the length of time that insolvent banks were left operating before liquidated or sold suggests that the agency problem still exist.

3.3.2.6. Other Agency Problems in Banking

Preservation of *charter value*[438] (e.g., Sinkey 1998) and *franchise value*[439] are identified in the banking literature as relevant considerations for bank's capital structure decision-making (e.g., Demsetz, Saidenberg, and Strahan 1996). The rationale here is that both reduce the incentive for the assumption of increasingly riskier managerial financing choices.[440] However, bank's equityholders may have less incentive to act cautiously with regard to risk-taking if bank charter values fall. This happened in the U.S. during the 1980s due to poor profitability resulting from heightened competitive pressure on banking markets (e.g., Keeley 1990). Empirical evidence supports the notion that banks with higher charter and franchise value tend to exhibit higher capitalization and lower asset risk, yielding a lower total risk.

Banks with large franchise values may be predisposed to operate more safely than those banks with little (or none) franchise value as precautionary strategy to preserve. For instance, high-franchise-value banks may be more likely to hold capital in excess of that

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[438] According to Sinkey (1992, 739) *charter value* may be seen, in general terms, as the total value of all intangible assets. The loss of charter value can be viewed as the costs of bankruptcy. Once a bank's charter value is exhausted it has nothing more to lose. According to Greenbaum and Thakor (1995, 541) a bank's charter value is the "economic value of a bank to its owners (the shareholders). It can be viewed as the net present value of the profits expected to accrue to the shareholders over the life of the bank." Buser, Chen, and Kane (1981, 51) define a bank's charter value, simply, as the "value of the right to continue in business."

[439] Authors conceptualize *franchise value* as the present value of bank's future expected profits on a *going concern* basis.

required by regulations, may limit their exposure to high-risk borrowers, and may hold well-diversified loan portfolios. It seems reasonable to hypothesize that, in general, high franchise value banks design their risk-taking strategies to preserve their franchise values from the risk of insolvency.

3.3.2.7. Some Summary Remarks

The risk-taking profile of a bank is contingent on its claims structure, on the level of alignment between managers and equityholders, and on the presence and structure of regulatory intervention. As insiders' bank ownership increases, some scholars maintain that their interests will tend to become more closely aligned with outside investors' interests, creating a strong incentive to maximize the value of their call and put options by appropriately *increasing the risk level*.

Other scholars (e.g., Smith and Stulz 1985) argue that as managerial ownership holdings increase, managers will *become more risk averse* and are increasingly likely to pursue hedging and other risk-reduction strategies. This is because managers may not hold well-diversified portfolios and will, therefore, have incentives to reduce the riskiness of the bank's returns. Arguably, the presence of managerial risk aversion may offset the excessive risk-taking propensity stemming from incentives to moral hazard behavior.[441] The relationship between ownership structure and risk-taking is, arguably, significant only at low-franchise value banks — those with potentially more severe moral hazard problems and owner–manager conflicts over risk-taking preferences. In this framework, bank insider's equity holdings do affect risk-taking through asset risk while ownership concentration affects risk taking through leverage.[442] This is consistent with the idea that outside blockholders more readily control managerial risk-taking by influencing leverage than by influencing asset risk.

Taken together, agency problems between shareholders and creditors and between shareholders and managers confront shareholders with a tradeoff. Higher capital reduces the wealth transfer problem between shareholders and creditors but aggravates conflicts of

[440] Regulators restrain such incentives by threatening to interfere in a bank's operations and to revoke a bank's valuable charter (e.g., Buser, Chen, and Kane, 1981; Marcus 1984).

[441] Underlying there is the presumption that bank owners and managers engage in efficient contracting in the sense that the arguments in the managers' compensation function are positively related to the owners' wealth (e.g., Clinch and Magliolo 1993).

[442] As pointed out, e.g., by Ross (1977, note 13) the increase of managerial ownership is likely to make arise risk aversion behavior. In these instances managers will have an incentive to attempt to reduce the risk of asset portfolios once they are likely to be undiversified investors.

interest between shareholders and managers, and vice versa for lower capital. Unfortunately, the corporate finance literature has made little progress in quantifying this tradeoff, and so the net impact on capital market 'requirements' is ambiguous.

3.3.3. BANKS CAPITAL STRUCTURE CHOICE WITH ASYMMETRIC DISTRIBUTION OF INFORMATION

It is a well-established notion that differentiated allocation of (costly) information between a firm's insiders and outsiders is a major departure from the assumptions underlying the Modigliani and Miller irrelevance theory. Furthermore, it is also recognized that the presence of this friction will make firms incur in relatively higher costs of raising external capital, and therefore becoming an additional reason for why capital structure choice does matter.[443] In this vein, more recent work has suggested that in a framework characterized by non-uniformly distributed information between *insiders* (managers / owners) and *outsiders* (capital market participants) the decision of adjusting the capital structure may convey important information (e.g., DeYoung *et al*. 1998). Therefore, a significant part of the research in this area has focused on new securities offerings by firms.

As has been discussed in earlier sections there is abundantly documentation in the literature suggesting that a bank is not exempted from the problems of asymmetric information. This acknowledgement is supported, not only on the imbalanced distribution of information between banks' insiders and outsiders, but also predicated in informational considerations linked to its role as financial intermediary. More specifically, in the (1) prominent role as information processors and providers,[444] and (2) the *opacity* associated to some of its actions.[445]

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[443] Outside claimants also would need to monitor and discipline inside investors as they might face incentives to behave self- interestedly.

[444] Diamond's (1984) theory stresses the functional role of the banking firm as an *information processor*. According to this theory, banks exist because they are able to capture economies of scale (and comparative advantages) in the production of private information inherent to their financial intermediation technology. In this sense, banks may be seen as experts in lending to information-problematic borrowers, such as, a firm needing some specific financing arrangement found, otherwise, costly to communicate. The acquisition of information is made in the loan screening and contracting processes, and augmented over time by the oversight of the bank-customer relationship (e.g., Petersen and Rajan 1994). The role performed by banks as monitors of borrowers is recognized as helpful in reducing asymmetric of information among market participants.

[445] Ross (1989) argues that "loan organizations are opaque" because they only allow market participants a blurred view of their *true* characteristics.

By the same token, when we recognize that (1) a bank may be run by professional managers lacking the incentives provided by ownership rights; and (2) that a bank's insiders might have an informational superiority in relation to outsiders, than the capital structure decision should not neglect the costs associated with these considerations. In this framework, when insiders know more about the risk (quality) of a bank's asset portfolio than outsiders do, their informational superiority may have a distortionary effect on decision-making, if a bank must raise funds from uninformed external investors. In this situation, high-quality banks would be willing to signal their (true) quality by holding riskless asset portfolios in order to enable them to signal their higher than average 'quality' and therefore reduce the *deadweight costs* of asymmetric information,[446] and therefore issue risky debt at a lower interest rate (e.g., Lucas and McDonald 1992, 1987).[447]

Asymmetric information problems in a banking firm may erupt from both sides of its balance sheet. Whatever the circumstances, the problem always arises as a manifestation of one of three different kinds of contractual opportunistic behavior: *ex ante*, *interim*, and *ex post* —, the so-called *adverse selection problem*,[448] *moral hazard problem*,[449] and *costly state verification problem*,[450] respectively (see, e.g., Freixas and Rochet 1997, 16).

It is intuitive that borrowers know more about their default risks than lenders do. Such informational asymmetry may create an adverse selection problem (underinvestment) which, in line with Akerlof's (1970) and Myers' (1977) arguments, may lead to *credit rationing* (e.g. Stanton 1998).[451]

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[446] As measured by the differential between the cost of capital reflecting the true quality (risk) of an issuing firm and the return required by poorly informed investors that, as shown by Akerlof (1970), corresponds to the average quality (risk) as it is perceived by market participants.

[447] Empirical evidence documents that banks with higher asset quality do in fact hold more cash and securities what may be interpreted as evidence supporting this proposition.

[448] Adverse selection in financial markets occurs when the potential borrowers who are the most likely to produce an undesirable outcome—the bad credit risks—are the ones who most actively seek out a loan and are thus most likely to be selected. Since adverse selection makes it more likely that loans might be made to bad credit risks, lenders may decide not to make any loans even though there are good credit risks in the marketplace.

[449] Moral hazard in financial markets occurs when the lender is subjected to the hazard that the borrower has incentives to engage in activities that are undesirable from the lender's point of view, because these activities make it less likely that the loan will be paid back. Since moral hazard lowers the probability that the loan will be repaid, lenders may decide to restrain themselves from transacting.

[450] See, among others, Dowd (1996) and Townsend (1979).

[451] See Wagster (1999) for an examination of the credit crunch problem in banks from Canada, Germany, Japan, the United Kingdom, and the United States during the 1989-1992 period. Results are consistent with the *asset reallocation hypothesis* in Canada, the United Kingdom, and the United States during that period.

The notion that a bank is an *opaque* entity is well-established and enjoys widespread support. Understandably, asset allocation decisions of a bank, as well as the risk / return attributes of a significant part of its assets are unobservable by outsiders.[452] It is also recognized that financial intermediation activity helps in resolving (or mitigating) asymmetric information problems arising in both firms and individuals' financial contracting. Banks acquire an informational advantage by producing private information through the screening and monitoring activities of their loan customers. However, this informational superiority may become itself a source of further asymmetric information problems, this time, between banks and financial markets. It is trivial that insiders should typically have more information about a bank's earnings prospects and future financial condition than capital markets participants. Because of this *opacity*[453] investors will have to draw inferences from the actions of the bank's managers, who may, therefore, attempt to convey their private information to market participants by emitting credible signals, such as capital structure decisions.[454] When the management team is in possession of inside information about the value of the firm's assets, future cash flow streams and investment opportunity set, capital structure adjustments are valid "information-revealing decisions" (Grinblatt and Titman 1998, 633) to convey that information to investors.

As explained by, among others, Ross (1977), Leland and Pyle (1977) and Myers and Majluf's (1984), a firm's security issues decisions arguably have an informational content. Therefore, the announcement of debt and equity security issuance conveys information to capital market participants about the firm's *true* characteristics.

As shown in Ross' (1977) model, firms whose managers believe have poor prospects are more likely to issue equity, while firms whose managers believe have good prospects are more likely to issue debt.[455] If it is less costly for a 'good quality' bank to

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Mixed results are reported for the four supply-side research hypotheses — *voluntary risk-reduction*, *higher regulatory scrutiny, risk-based capital* and *unweighted capital ratio*.

[452] Berger and Davies (1994), e.g., suggests that "banks hold a substantial amount of private information about their own conditions"

[453] One of the reasons banking firms' assets are characterized by a significant amount of opacity is that "banks know more about the quality of their assets than do outside investors" (Lucas and McDonald 1992, 86). See also Ross (1989).

[454] Market participants may draw inferences about a bank's condition and prospects from both debt and equity securities issues (e.g., Wall and Peterson 1998). However, differences in the claims of debt and equity securities on a bank's cash flow tend to make the former less sensitive to market *misestimation* than the latter.

[455] Wall and Peterson (1996) provide support to this view arguing that the "attempts to raise new capital via stock issues could be costly to shareholders because such efforts signal that management has adverse news about the bank."

signal its higher quality by incurring more financial leverage than for a 'bad quality' bank, then a signaling equilibrium may exist in which banks that expect to have better future performance will have lower capital ratios (Ross 1977).

Leland and Pyle (1977) demonstrate that when the verification of true characteristics of a project (firm) by outsiders may be too costly or even infeasible, funding new 'good quality' projects (firms) require a credible and observable signal in order the transfer information to less informed outsiders investors. This signal, according to Leland and Pyle, be may be insiders' investment in the project's (firm's) ownership.

Myers and Majluf's *overvaluation* and *undervaluation* hypotheses support the prediction that firms issue equity securities when managers perceive the stock to be overvalued,[456] and debt securities otherwise. Stated in general terms, their model suggests that a firm is most likely to prefer to issue debt securities rather than shares of stock. Embedded in this hypothesis is the notion that actions implying that future earnings will be sufficient to generate adequate capital are a positive signal to shareholders while actions that imply future earnings will be insufficient are a negative sign. Their model approach has been extended to develop hypotheses about other methods of maintaining or raising capital ratios such as recognizing gains on appreciated assets — actions that do not include equity issuance.

Thus, theory suggests a variety of benefits and costs to shareholders with the use of higher capital ratios. These benefits include a reduction in taxes, an increase in the value of deposit insurance, and an increase in bank management teams' incentives to operate efficiently. The costs include the increased deadweight costs of bankruptcy, diseconomies of scale in producing deposit services, and incentives to take on excessive risk. Theory also suggests that the optimal level of capital from the managers' perspective may be higher than that desired by shareholders if managers are risk averse. In addition, banks may not always be at their optimum level of capital if adjusting capital ratios is costly. Announcements of new capital issues may be viewed by the market as an adverse signal about the issuing bank's value and hence lead to a decline in the price of the bank's stock."[457]

This *information hypothesis* has been submitted to empirical testing in the context of the examination of the stock price reactions to announcements of common stock

[456] When managers believe that the firm's stock price is higher than the security's intrinsic value.

offerings of U.S. commercial bank holding companies (e.g., Cornett and Tehranian 1994; Keeley 1989; Polonchek, Slovin and Sushka 1989; and Wansley and Dhillon 1989).[458] Results reported are fairly consistent with the prediction of Stephen Ross' signaling theory that the announcements of common stock issuances are associated with significant negative stock price reactions.[459] However, reactions are smaller than those found for non-financial firms.[460] Keeley's (1989) findings imply that involuntary stock issues may produce a significantly more negative return than voluntary issues, this might be interpreted as inconsistent with the predictions of Ross' (1977) model. Keeley, however, offers an explanation based on asymmetric information considerations for this potentially contradictory result. As the argument goes, once the market recognizes a bank as being under regulatory pressure to increase its capital-base, this situation may convey (negative) regulatory inside information about the bank's future prospects.[461]

Banks' informational competitive advantage, according to modern banking theory (e.g., Das and Nanda 1999; and Freixas and Rochet 1997), mitigates asymmetric information problems between banks and borrowers is based on the development of long-term relationships.[462] This conduct helps banks to evaluate their borrowers' creditworthiness and to monitor their performance over time. In the United States, there is substantial evidence supporting the hypothesis that private information and associated relationship-specific activities are intrinsic to bank lending. For example, event studies conducted by James (1987) and Lummer and McConnell (1989) found that the announcement about bank credit agreements led to large positive stock returns of borrowing firms. They concluded that banks used private information unavailable to the

[457] See Wall and Peterson (1996).
[458] In these empirical studies no distinction is made in respect to voluntary and involuntary security issues.
[459] As discussed in chapter 2, Myers' undervaluation theory yields a similar prediction.
[460] For evidence of stock price reaction to new common stock issues of non-financial firms see the summary of empirical literature appended to chapter 2. Cornett and Tehranian report that the two-day announcement abnormal returns of voluntary common stock and straight debt issues were -1.56 percent and 0.17 percent respectively. The two-day announcement abnormal returns of involuntary common stock and straight debt issues were –0.64 percent and 0.32 percent respectively. The abnormal returns of voluntary common stock and its difference to abnormal returns of involuntary common stock are statistically significant at the 1 percent an at the 5 percent level respectively.
[461] Other explanations offered by the author relates (1) to the capital issue negative effect on the value of the deposit insurance guarantee, and (2) to the possible influence of market frictions, such as taxes and agency costs, on the bank's deviation from its optimal capital structure.
[462] As previously explained banks produce private information on informationally opaque borrowers through the process of loan contracting. Arguably, the bank-borrower relationship is valuable because its disruption (as shown in Slovin, Sushka and Poloncheck 1993) may engender significant costs for borrowing firms. The

market when they made loans. Slovin *et al*. (1993) investigated share price effects on the client firms of the Continental Illinois Bank failure in 1984 and reported similar findings.[463]

When both asymmetric information and transaction costs are present in new security offerings, then these *market frictions* may exert some influence on the relative costs of internal versus external finance and the relative costs of debt versus equity. When insiders have a significant private information advantage over outsiders, shareholders may be reluctant to issue new equity, arguably because they might fear *underpricing*.[464] Moreover, transaction costs in raising funds externally may be quite substantial, particularly in equity issues.[465] In contrast with non-banking firms, banks typically have a transaction cost advantage in issuing additional liability securities either in the form of deposits and/or by borrowing against their *financial slack*. Such cushion of funding capacity offers a valuable 'protection' against costly unexpected adverse shocks, besides securing the financial viability of unexpected profitable investment opportunities.[466]

As suggested by Wall and Peterson (1998) the regulatory discipline of banks' capital adequacy may be biased towards requiring new equity issues instead of new debt issues, or restricting or disallowing equity for debt swaps. In such instances, unnecessary costs will be imposed to 'good quality' banks by making them stay away from their optimal capital structure, and by making them issuing recognizably more expensive new equity securities rather than issuing new debt.

Myers (1984) and Myers and Majluf (l984) argued that firms do follow a *pecking order* in using their financing sources. At the top of the pecking order are internally generated cash flows, which have transaction and information costs advantage over equity

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conceptual foundation of their argument is rooted in the recognition that there is relationship-specific private information in bank credit activities.

[463] Yamori and Murakami's (1999) paper reports that in Japan "firms with a closer relationship to the Hokkaido Takusyoku Bank […] were more likely to record larger negative abnormal returns." This evidence supports the hypothesis that in Japanese banking market a bank (main) relationship is valuable.

[464] Equityholders, as residual claimants on a bank's value, may be reluctant to additional equity offerings for several reasons. Among them, and because of common equity value sensitivity to market misestimation and because of wealth transfers from old shareholders to old creditors if interest rates on outstanding debt are not easily lowered to reflect its increased safety (Miller 1995).

[465] These transaction costs typically include preparation of the registration statement and prospectus registration fees, printing and mailing costs, underwriting fees, and possible costs of underpricing.

[466] In these instances, costs of financial distress associated with an undercapitalized state tend to be substantial. Similarly, transaction costs involved in raising new equity capital in a 'fire offering' of stock might well prove too costly in the Myers-Majluf sense.

capital. If external funds are needed, (tax-deductible) debt is usually preferred to equity because its issuing costs are usually lower, and because debt reduces verification costs (e.g., Townsend 1979). All of these incentives may be accentuated for small banks, which typically face very high transaction costs in issuing new equity.

As discussed in the previous subsection, asymmetric information problems may also lead to agency conflicts between shareholders and creditors (debtholders, and insured and uninsured depositors) that are exacerbated in financial distress situations. Shareholders may find that actions which maximize the value of all claims on the bank do not necessarily maximize the value of their own claims. This may lead to attempts on their part to shift wealth from creditors to shareholders.

As hypothesized by a number of authors, (e.g. Beaver, Ryan and Wahlen 1997; Wahlen 1994; and Elliot, Hanna and Shaw 1991), in the banking industry, managerial discretion over loan loss provisions can provide a signaling device to capital markets. Thus, announcements of adjustments in reserves for loan losses have an information content. This part of the empirical literature documents that discretionary loan loss provisions are positively associated with bank stock returns.[467] As conjectured by Scholes, Wilson and Wolfson (1990), there is likely to be an incentive to manage reported earnings what may be seen by capital market participants as conveying private information and thereby contribute to lower the bank's cost of capital.. These authors also find evidence of earnings, capital and tax management.[468] Collins, Shachelford and Wahlen (1995) provide evidence consistent with management of tax liability and capital position using loan charge-offs, loan loss provisions, security issuances, and dividends. Wahlen (1994) provides empirical evidence documenting that after controlling for current changes in cash flows, unexpected changes in non-performing loans, and unexpected loan charge-offs, unexpected provisions are positively related to future changes in cash flows.[469] The

[467] However, in a recent study, Ahmed, Takeda and Thomas (1999) report that "loan loss provisions are negatively related to both future earnings changes and contemporaneous stock returns contrary to the signaling results documented in prior work."

[468] Earnings management, according to Healy and Wahlen (1999), "[…] occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers."

[469] Loan provisions, loan charge-offs, and non-performing loans have distinct natures. Under *generally accepted accounting principles* (e.g., U.S. Statement of Financial Accounting Standards No. 5), loan loss provisions should reflect managerial expectations on the period changes of probable future loan losses. Loan loss provisions are, though, inherently judgmental estimates and thus discretionary. Differently, loan charge-offs and changes in non-performing loans are relatively less discretionary and so can be used as indicators of

evidence, therefore, suggests that bank managers are likely to increase the discretionary component of unexpected loan loss provisions when future cash flow prospects are favorable.[470] The results of Ahmed, Takeda and Thomas' (1999) empirical testing of the *capital management hypothesis* indicate "strong support for the hypothesis that loan loss provisions are used for capital management."[471] Moyer (1990) also reports evidence consistent with the capital management hypothesis.

Empirical findings by Beatty, Chamberlain and Magliolo (1995) suggest that "firm financing decisions can depend on the level of accounting discretion managers are able to exercise and vice versa."[472] In addition they "document that decisions about accounting affect the timing of securities issuances." They also report that their evidence "supports the notion that […] investment, and financing decisions are not independent" contradicting the *irrelevance theory* of Modigliani and Miller (1958).

Beatty, Chamberlain and Magliolo (1995) find no evidence in support of the hypothesis that taxes play a role in either delaying or accelerating loan charge-offs such result is interpreted as inconsistent with the tax management hypothesis.[473] Greenawalt and Sinkey's (1988) empirical findings are consistent with the *income-smoothing hypothesis*.[474] The authors also looked for alternative explanations rooted in managerial behavior theories addressing problems such as agency conflicts, compensation incentives and risk-taking propensity. Dividend policy was also taken into consideration. Moreover, Greenwalt and Sinkey argue that loan loss provisions sometimes signal asset quality, which "may

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the non-discretionary portion of the loan loss provision. Loan charge-offs reflect total principal in loans deemed uncollectible by management during the period (net of recoveries). At the time of loan charge-offs, specific loans are removed from the accounting books. Non-performing loans include the principal of all loans that are overdue for more than a certain period (e.g., 90 days).

[470] As argued, among others, by Beaver, Ryan and Wahlen (1997) discretionary loan loss provisions are positively associated with bank stock returns and future earnings.

[471] However, they fail to "find evidence of earnings management via loan loss provisions."

[472] The authors further claim that "the decision to issue equity, capital notes, and preferred stock depends on miscellaneous gains and loan loss accruals."

[473] They report that "loan charge-offs, loan loss provisions, and the decision to issue securities are jointly determined" and "[a]pparently, this interaction results from the use of all three transactions to manage primary capital ratios." However, the authors claim that "[t]he provision for loan losses, loan charge-offs and issuances of securities are all used to manage primary capital ratios."

[474] The authors examined a sample of 106 U.S. bank holding companies, during the period 1976-1984.

influence the ability of banks to increase leverage" (Osterberg and Thompson 1996, 319).

Dividend policy is also an important consideration for a bank's capital structure choice, particularly in a differentially informed setting. If because of costs of asymmetric information insiders adopt a pecking order of financing, with everything else held constant, then security issuance will be contingent on dividend payments to shareholders. Moreover, the degree of asymmetric information in a bank's environment should imply "that dividend reductions should be a negative signal for banks share prices." Recently, observed by Slovin, Sushka and Polonchek (1999, 200) observed that we are still lacking a "comprehensive study of bank dividend payout, even though several aspects of banking make it a unique setting for analyzing dividend reductions." Thus, further investigation in this area is required to substantiate our conjectures and therefore extend our understanding of the *dividend puzzle*.

3.3.4. CONCLUDING REMARKS

The discussion we have been conducting on the capital structure problem at the banking firm level shows that, once we conceptualize the propositions of the general theory of capital structure in a banking framework, there is a potential for developing testable hypotheses for empirical testing. However, relatively little attention has been devoted in the literature to such examination of the determinants of capital structure choice in banking habitats. Thus, it is not surprising that the empirical validation of theories and concepts on this area is truly scarce as the following papers review illustrates.

Marcus (1983) examined data from a sample of 44 banks taken from bank Compustat tapes for the period 1958-1977. His empirical findings suggest that banks capital ratios are inversely related to changes in interest rates and to the tax disadvantage of equity financing. Furthermore, the author argues that costly deviation from target capital levels and economies of scale in rising equity capital (Smith 1977) might explain the large swings experienced by U.S. banks in their capital bases during the 1970s. Finally, evidence suggests banking regulators tend to view a bank's capital relatively to other banks.

Sharpe (1995) examined a sample of 13 Australian trading banks (231 annual observations) during the period 1967 through 1988. Underlying this study is the presumption that regulatory jurisdiction under capital and deposit insurance (or similar

guarantees) is absent in Australian banking habitat. He documents an inverse relationship between banks' capital ratios and growth opportunities and a positive relationship with (expected) retained earnings. These empirical findings are consistent with the asymmetric information explanation of capital structure. Hypotheses related to income tax (at the bank level) and bankruptcy considerations received weak empirical support.

Osterberg and Thomson (1996) used semi-annual data on a sample of 232 U.S. bank holding companies, from December 1986 to December 1987, to investigate the impact of banks' regulatory capital standards on their leverage ratios. Findings suggest that capital regulation influence bank financial leverage. Moreover, it is shown that financial leverage of banks leveled with capital regulatory standards is affected by market discipline and financial leverage of over-capitalized banks (in relation to capital regulatory standards) are affected by capital regulatory discipline. Therefore, a bank meeting or exceeding the regulatory capital standards should expect such standards to affect banks' financial leverage.

Hasan (1997) investigated data from Call and Income Reports (Federal Deposit Insurance Corporation tapes) of 1307 U.S. banks during the 1985 through 1994.[475] His testable hypotheses included a U-shaped relation between optimal leverage and business risk; an inverse relation between financial leverage and. the ratio of risk-weighted assets to total assets; and a positive relation between leverage and the bank size. Although regressions yielded the expected signs of the relevant coefficients, he failed to detect statistical significance.

Overall, these three empirical investigations do not provide persuasive and affirmative evidence to substantiate the validity of hypotheses formulated to foster our understanding about the determinants of banks capital structure choice. Nevertheless, these studies were instrumental in revealing some problematic sources of empirical inconclusiveness, and therefore were helpful in the design and specification of some of the hypotheses included in the theoretical model framed in our questionnaire. In contrast with this *panorama* we submitted to empirical testing (see chapter 5) a non-negligible number of propositions in the form of a survey questions.■

[475] The sample includes 328 large (with total assets of more than 1 billion U.S. dollars) banks and 979 small banks.

Chapter 4

The Portuguese Banking Industry: A Characterization

CHAPTER 4: The Portuguese Banking Industry: A Brief Characterization

4.1. INTRODUCTION

The empirical investigation of this dissertation (included in Chapter 5) is dedicated to test various capital structure propositions. To this end we used data collected through a survey conducted to a sample of CEOs of Portuguese banks, and their accounting data assembled in a database. To contextualize that part of our study, in this chapter we aim at providing a broad characterization of the Portuguese banking industry, as well as describing some aspects of their recent financial performance, such as capitalization and profitability.

First, we describe the design of the banks financial statement database developed for this study. Secondly, we put the evolution of the Portuguese financial system in the last quarter century into perspective, focusing on the milestones of the banking industry modernization and liberalization after 1984. Third, we examine the recent performance of a sample of Portuguese banks.

We append to this chapter: (1) a summary of the milestones of the modernization and liberalization of the Portuguese financial system (Appendix 4.1); (2) a synthesis of the privatization of nationalized banks (Appendix 4.2); (3) a comprehensive map of the Portuguese banking industry during the 1989-1998 period (Appendix 4.3); (4) a list of acronyms (Appendix 4.4); and (5) an illustrative comparison between Portuguese and U.S. Generally Accepted Accounting Practices (GAAP) in banking (Appendix 4.5).

4.2. SOURCES AND DESCRIPTION OF DATA

To frame our empirical examination, define the survey population and design the sample, we needed to collect the relevant data. Unfortunately, in contrast with the U.S. (and other countries), there are no currently available public databases of accounting and market data in Portugal, like Compustat or CRSP tapes. In order to overcome this shortcoming, we had to build from scratch a database using the publicly available information.[476]

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[476] At bank level, biannual and year-end accounting data is available from banks annual reports, and from the Bulletin published by the Portuguese Banking Association (APB). The Lisbon Stock Exchange publishes the financial statements of listed banks. Quarterly balance sheet data is published by the "Diário da República", the official journal. APB does not disclose the financial statements of individual banks when these are compelled to consolidation. We could not find a satisfactory explanation for this behavior.

Firstly, we collected copies of banks' annual reports starting in 1985, which we requested through a mailing addressed to all banks. Using financial statement and operating data published by the Portuguese Banks' Association[477] (APB) in its "Boletim Informativo," we built, in a spreadsheet format, one time series and one cross-section database covering the 1982-1998 period. The databases include both balance sheet and income statement data, which was manually keyed in. We also used formulas to ensure and control data consistency.[478] Market data — share prices and stock market indexes — was also collected from the Lisbon Stock Exchange files and from Banco Totta & Açores (BTA) for its stock market index. Table 4.1 reports the number of banks annually included in the database.

Table 4.1
Number of Banks Included in Database

Year	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Banks	17	17	18	25	27	27	27	27	35	36	35	43	45	45	46	49	54

Specific mandatory accounting standards and rules for banks were enforced in 1989.[479] This introduction, as acknowledged by practitioners, induced substantial adjustments and modifications in accounting practices and financial reporting of banks [e.g., APB Boletim Informativo 3(6): December 1990]. The implications, in terms of data for our study, resulting from the modification of banking GAAPs were minor. Essentially, we had to readjust in 1989, 1990 and 1991 balance sheet data, the concept of equity capital by excluding from it income bonds, subordinated debt and provisions. Starting in 1992,[480] mandatory accounting consolidation rules were enforced for banks, following the 1991 transposition to the Portuguese juridical order of the European Union (E.U.) 7th

[477] Translation of the Portuguese expression "Associação Portuguesa de Bancos".
[478] We created a control variable to compute eventual differences between total assets and total liabilities and equity capital. In addition, we built a link between net earnings calculated in the income statement and equity capital in the balance sheet through retained earnings.
[479] The first attempt to impose accounting standards to banking firms dates back to 1959 (Decree of Law No. 42641). In 1978 banking accounting standards were introduced (Decree of Law No. 455/78, from December 30) which were applied until 1989. Since then, responsibility was committed to BP to define, enforce and oversee banking accounting standards (Decree of Law No. 91/90, from March 17).
[480] See Decree of Law No. 36/92, from March 28.

Directive.[481] This new accounting framework did not require any adjustments to the data for the purpose of our study.[482]

4.3. THE PORTUGUESE BANKING INDUSTRY AFTER 1974: AN OVERVIEW

Banking markets across the world have undergone significant changes in the last 25 years. As national economies and financial markets became increasingly integrated and liberalized, volatility surged and competition steadily evolved to higher thresholds.

In the last 25 years the Portuguese banking system has been submitted to significant pressure for structural readjustment undergoing a process of substantial reorganization.[483] This process was a consequence of the confluence of *global forces of change* and *internal factors* that propelled compounded and self-reinforcing effects.[484]

Various political and economic events, unfolding since the early 1970s, were important determinants of the actual shape of the Portuguese banking industry. The most influential factor at the internal level, however, was the *revolutionary process* initiated in April 1974, and the political and economic events it consequently propelled. Among those was the massive program of nationalization of the economy undertaken in 1975. Starting in the 1980s, the confluence of several factors induced the emergence of a substantial process of economic liberalization. Among those factors were (1) the entry into the European Economic Community (EEC) in 1986; (2) the adhesion to the European single market in 1992; and (3) the entry in the third phase of the Economic and Monetary Union (EMU) in the end of 1998.[485]

As noted earlier, in the aftermath of the political unrest of April 25, 1974, the Portuguese banking system experienced a dramatic change that culminated, in 1975, with the nationalization of all Portuguese privately owned banks. Subsequently, new entries in

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[481] See Decree of Law No. 238/91, from July 2.

[482] See Appendix 4.5 for an illustrative comparison between Portuguese and U.S. general accepted accounting practices (GAAP).

[483] See Appendix 4.1 for a summary of the milestones in the process of modernization and liberalization of the Portuguese financial and banking system.

[484] According to Brennan (1997), the main consequences of the global forces of change were: the pervasive integration of world's economies and their markets, the changing role of the state and the citizen, technological development, and markets deregulation. Overall, the effects of this process of change include (1) the fragmentation of financial services' supply; (2) changes in patterns of demand for liquidity; (3) shifts in asset holdings; and (4) the declining role of traditional banking. See De Bandt and Davis (1999) for an examination of the European banking market structure during the period 1992-1996. Boyd and Gertler (1993) examine the U.S. commercial banking industry in the 1980s.

[485] Barata (1995) provides an analysis of the evolution of the Portuguese banking system during the 1986 to 1992 period.

the industry were prohibited and the management of banks and banking markets became extensively and heavily regulated.

By the mid 1980s, coinciding with the process of the integration in the EEC, a period of deep economic liberalization started to unfold leading to a significant modernization of the Portuguese financial and banking systems. The most prominent steps in the process include (1) the reopening of the banking industry to private investors (1985); (2) the setup of new banking ventures lead by Portuguese private investors; (3) the inception of new branches of foreign banks (1985/1986); (4) the progressive abolition of the administrative ruling of interest rates (1985/1989), as well as the restrictions to bank lending (1990/1991);[486] (5) the progressive elimination of capital movements control (1992); and (6) the initiation of the reprivatization of formerly nationalized banks (1989).[487]

During this time span financial markets, with virtually no activity after the 1974 revolution, were revamped and restarted their operations in a new regulatory and operating framework. The privatization of former nationalized banks, deregulation trends and the challenges of the 1993 European single market for financial services, were some of the determinants of the financial liberalization process (e.g., Decressin and Mauro 1998). These factors should not be overlooked when we examine the restructuring and development process of the Portuguese banking industry.

In the last decade, probably no other sector of the Portuguese economy experienced such a dramatic change, as the banking industry. From ownership, to product development, distribution, strategy, operations, and balance sheet structures. Everything changed, sometimes radically, in the context of fast changing political and economic framework, and regulatory and supervisory regimes. Eventually, the dynamics of these (interactive) events set the stage for a reasonably competitive banking system prepared to face the challenges of fierce competition both domestically and internationally. Thus, Portuguese banks had to readjust rapidly in order to cope with more open and competitive financial markets where challenges and threats are similar to all competitors.

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[486] Popularized as *credit ceilings*.
[487] See Appendix 4.2 for a schedule and a chronology of the bank privatization program.

The surge of private investment in banking determined the inception of a number of *de novo* banks,[488] which implemented aggressive growth strategies, generally, through acquisitions of existing banks made available by the privatization process.

4.4. THE ARCHITECTURE OF THE PORTUGUESE BANKING INDUSTRY (1989-1998)

A better understanding of the object of our empirical examination requires the description and characterization of the architecture of the Portuguese banking industry from 1989 to 1998.

To characterize the Portuguese banking industry in terms of its size (number of banks) and composition we can, basically, resort to two sources of data. These two main providers of information are the Portuguese Central Bank, "Banco de Portugal", and the Portuguese Banking Association, "Associação Portuguesa de Bancos". Unfortunately, it is almost impossible to reconcile data from those two sources. BP data refers to banking institutions (either credit institutions or financial companies) registered and authorized to operate in the Portuguese territory,[489] while APB data covers the affiliated banks only.

As a consequence of the process of change discussed earlier, the Portuguese banking industry has recorded a significant number of newcomers, as well as exits and consolidations. To account for these movements is important step in order to assess the actual shape of the industry.

According to APB's "Boletim Informativo" there were, by the end of 1998, 43 banks. However, BP's 1997 Annual Report and Decressin and Mauro (1998, table 2) report the existence of 62 registered and accredited banks.[490] Furthermore, the financial institution list annually provided by BP reports the existence of 42 banks (for reasons we

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[488] Such as, Banco Comercial Português (BCP), and Banco Português de Investimento (BPI).

[489] Banco de Portugal lists include banks, branches of credit institutions with head offices in the E.U., or credit institutions with head offices in third countries (branches and representation offices). These entities are mostly representation offices acting as operating extensions of banking entities incorporated in any other country. In general they have a narrow scope and are mainly active in interbank and wholesale banking markets.

[490] The table included in Appendix 4.3 describes the composition of the Portuguese banking industry based on APB data.

cannot explain) not including two existing mutual banks and CGD.[491] Thus, we could arrive at an estimate for the total number of banks of 45.[492]

Whatever perspective we adopt to report the number of banking institutions in the marketplace, both BP and APB data suggest that the number of banks rose significantly during the 1989-1998 decade (see Table 4.1). This is interpreted as a strong indicator of the magnitude of the transformation experienced by the banking industry in Portugal.

Table 4.1
Number of Institutions in the Portuguese Banking System (1989-1998)

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Number of banks according to APB	27	36	37	36	45	46	46	46	45	46
Number of banks according to BP	27	31	35	36	42	45	48	51	62	62[a]

Sources: Author's estimates; Decressin and Mauro (1998) and Banco de Portugal annual reports.
[a] Estimate.

This evolution is even more impressive if we take into account that bank privatization started in 1989 and ended in December 1996.

4.5. INDICATORS OF PORTUGUESE BANKS FINANCIAL PERFORMANCE

According to Collins, Shackelford and Wahlen (1995) there are some empirical regularities in bank capital, earnings and tax management. This suggests that our search for stylized facts related with the financial performance of Portuguese banks, should not overlook these aspects.

Data for this analysis was drawn from our financial statement database. As we are interested in analyzing banks operating under the Portuguese law and whose financial decisions are made by local management teams, we deliberately excluded from the sample foreign (either from E.U. or from third countries) subsidiaries, branches, and representation offices. We also dropped banks that were operating for less than two full years at 1998 year-end. After this screening process we retained the sample presented in table 4.2.

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[491] The BP list also reports the existence of 26 bank representation offices, 36 subsidiaries of U.E. financial institutions and 3 subsidiaries of third country financial institutions.
[492] Montepio Geral and Caixa Central de Crédito Agrícola Mútuo are the two mutual banks excluded from the BP listing. See the banks listing in Appendix 4.4 for a configuration of the Portuguese banking industry according to the APB data.

Table 4.2
Number of Banks in the Sample

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Number of banks in the sample	20	20	21	21	28	31	31	32	34	32

A central aspect of the financing structure of banks can be evaluated through the evolution of their capital ratio (equity capital-to-total net assets). To make this analysis, we started computing the individual banks' annual capital ratio. Then, we estimated the aggregate indicator as an average weighted by net total assets. Table 4.3 presents the results and also includes capital ratio estimates provided by Banco de Portugal.

Table 4.3
Capital Ratio (1989-1998)

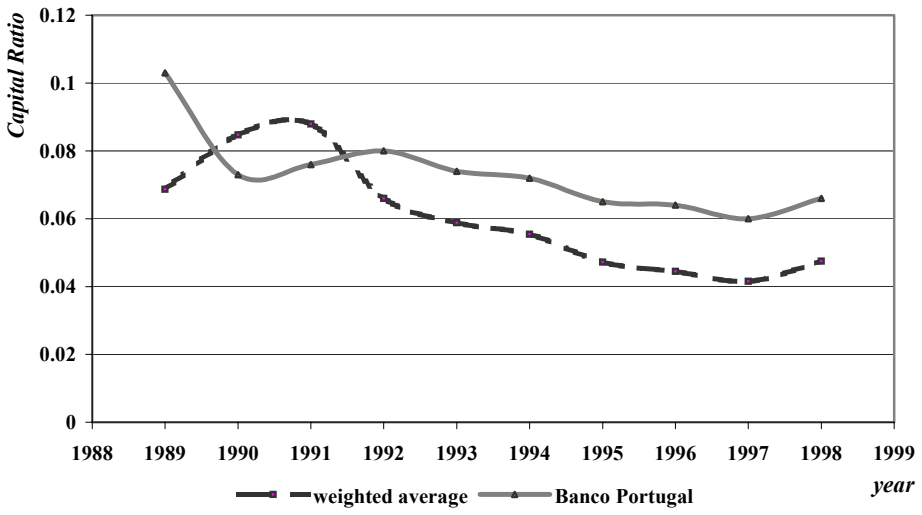
[unit: percent]

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Average	Standard Deviation
Sample	6.9	8.5	8.8	6.6	5.9	5.5	4.7	4.4	4.2	4.7	6.0	1.6
BP	10.3	7.3	7.6	8.0	7.4	7.2	6.5	6.4	6.0	6.6	7.3	1.2

Sources: Author's estimates; BP Annual Report [[1996, 180); (198, 195)]

According to our estimates, the average capital ratio during the 1989-1998 is 6.0 percent. The average calculated using BP data is 7.3 percent. Since we are not aware of the composition of BP sample, possible explanations for the difference between the two averages might relate to sampling or calculation method.

Figure 4.1
Capital Ratio of Portuguese Banks (1989-1998)



The graph depicted in Figure 4.1 reflects an inverse evolution of the capital ratio between 1989 and 1992. From then onwards, the two series are almost parallel. Interestingly, the period of time when the two series seem inversely related corresponds to the enforcement of capital adequacy requirements. Therefore, one might expect a build up in banks' capital-base to comply with the new capital standards (fully enforced by 1992), and consequently a rise in the capital ratio. Additionally, we may also conjecture that we should expect bank capital to pile up in preparation for the governmental privatization program, by that time well underway.[493]

According to our estimate, the average capital ratio peaked in 1991, i.e., around the period when capital adequacy standards were imposed following the 1988 Basle Accord. One potential explanation for this phenomenon may be related to Wall and Peterson's (1987) hypothesis that the mandatory primary capital requirements enforced by U.S. bank regulators in 1981 influenced changes in large bank holding companies in the three subsequent years.

To provide a means of comparison with banking institutions operating in the U.S. and thus submitted to dissimilar market and regulatory discipline, we include in Table 4.3 a summary of the evolution of capital ratio of commercial banks during the 1950-1992 time period.

Table 4.4
Capital Ratio of U.S. Commercial Banks (1950-1992)

[unit: percent]

	Mean	Standard deviation
1950	7.3	0.40
1960s	7.7	0.52
1970s	6.5	0.46
1980-1992	6.3	0.46

Source: Author's estimates; Data from Barth and Brumbaugh (1994, table 4).

The 6.3 percent average capital ratio of U.S. commercial banks during the 1980-1992 period compares with 6.0 percent for the banks in our sample and 7.3 for BP sample, both from 1989-1998. Volatility is higher for Portuguese banks (in both samples) than for U.S. banks. This result is not unexpected since in the Portuguese banking industry during that time frame there were a number of *de novo* banks which financial performance is

[493] See Appendix 4.2.

likely to be more volatile than their established peers (see, e.g., DeYoung and Hasan 1998).

Return on equity (ROE) and return on assets (ROA) are popular measures of bank performance. It is well known that ROE can be decomposed in terms of the product of ROA and the so-called 'equity multiplier' (EM), which is the inverse of the capital ratio.[494] Once we compute these indicators we are able to calculate Hannan and Hanweck's (1988) risk index: $RI = [E(ROA) + (1/EM)] / \sigma_{ROA}$, where $E(ROA)$ stands for expected return on assets, and σ_{ROA} for the standard deviation of ROA.

Table 4.4
ROA and ROE for Portuguese Banks (1989-1998)

[unit: percent]

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Average	Standard Deviation
ROE	12.8	18.4	22.7	15.7	18.6	4.8	9.3	18.4	24.3	25.2	17.0	6.5
ROA	0.7	1.1	1.1	0.9	0.7	0.6	0.5	0.5	0.9	0.7	0.8	0.2
(Implicit) EM	17.4	16.6	20.1	17.7	28.4	8.3	17.2	37.8	27.8	36.7	22.8	9.5

Source: Author's estimates

The average ROE, ROA and EM during the 1989-1998 period were 17.0 percent, 0.8 percent and 22.8 respectively. The volatility of these indicators can be considered as high as measured by variation coefficients of 38 percent, 25 percent and 42 percent respectively for ROE, ROA and EM. We understand these results as a consequence of the growth dynamics introduced by the presence of a number of *de novo* banks in our sample.

The calculation of the *RI* measure for our sample yielded a result of 3.6. According to Hannan and Hanweck (Ibid.) the *RI* measures, in terms of units of ROA standard deviation, how much the accounting earnings can fall before becoming negative. Therefore the lower the *RI* the riskier the bank.

Figure 5.2 portrays the evolution of ROE and ROA during the period under scrutiny.

[494] ROE and ROA were computed on a total asset weighted basis.

Figure 4.2
ROE and ROA (1989-1998)

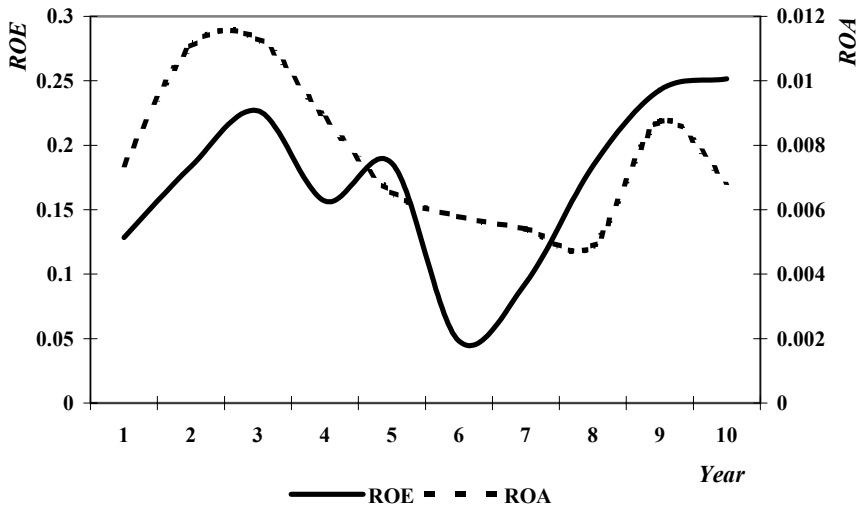


Table 4.5 provides ROA and ROE estimates of means and standard deviations of a sample of U.S. commercial banks during varying periods of time.

Table 4.5
ROA and ROE for U.S. Commercial Banks (1950-1992)

[unit: percent]

	ROA		ROE	
	Mean	Standard deviation	Mean	Standard deviation
1950	0.61	0.067	8.34	0.675
1960s	0.74	0.051	9.65	1.004
1970s	0.80	0.063	12.40	0.707
1980-1992	0.64	0.206	10.30	3.270

Source: Author's estimates; Data: Barth and Brumbaugh (1994, table 4)

The 10.3 percent ROE for the U.S. commercial banks included in the sample, during the 1980-1992 period, is significantly lower than the one we found for our sample of Portuguese banks. However, the difference is smaller in relation to ROA. The implicit EM, 16.1, is lower than the one observed in our sample. The risk index for these U.S. commercial banks was calculated as 6.1, which is substantially higher than the one observed in our sample. Overall, these results are consistent with the conjecture that U.S. banks might be closer to the mature phase of their life cycles than their Portuguese counterparts.

Another important dimension of bank performance relates to the management of their income tax liability. To illustrate this point we computed the implicit tax rate (as

measured by the relation between the annual provision for income tax and earnings before taxes).[495] Net total assets were used to estimate the weighted average of the implicit tax rate.

Table 4.3
Implicit Tax Rate of a Sample of Portuguese Banks (1989-1998)
[unit: percent]

	simple average	weighted average
1989	14,44	17,38
1990	19,13	17,83
1991	17,18	20,59
1992	17,00	15,94
1993	22,13	23,17
1994	18,53	19,52
1995	18,05	21,02
1996	17,69	23,23
1997	22,93	22,94
1998	17,74	22,94
1989 - 1998	18,48	20,46

Source: Author's estimates

On average, from 1989 through 1998 the implicit tax rate is estimated at 18.48 percent and 20.46 percent as a simple and weighted average respectively. This result shows that the banks with higher net asset values (and therefore the higher weights in the average computation) are likely to have a higher tax liability.

4.6. A PRINCIPAL COMPONENTS EXAMINATION OF PORTUGUESE BANKS' PERFORMANCE (1998)

The assessment of bank performance is a widespread practice among, namely, investment bankers, rating agencies, supervisors, regulators, and deposit insurers.[496] Given the characteristic informational opacity of banks performance analysis may prove difficult for a number or reasons.[497] Among them is the methodological design of such an examination.[498] Regulators and deposit insurers are among the entities that appraise bank

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[495] Because financial statements for "Caixa Central de Crédito Agrícola Mútuo" are only available after 1994 we excluded it from the sample.

[496] Traditionally on-site and off-site examinations have been, at least in the U.S., a primary mechanism used by regulatory and supervisory authorities to appraise bank performance.

[497] As suggested by Flannery and Houston (1996) "the commercial banking industry arguably has specially severe informational asymmetries, given its specialization in funding assets which cannot readily be sold in public markets."

[498] This might be explained by the large number of variable interdependencies, which should be looked upon when attempting to establish the statistical significance of some hypothesized relationships among them. As pointed out by Dhillon (1990, 23) "with large numbers of variables the number of relationships is so large as to be beyond comprehension, and some data reduction

performance more regularly and closely because of the incidences of capital standards and deposit insurance premia.[499] One of the instruments used by them in off-site examination of bank performance is the so-called CAMEL model.[500] This analytical tool enables examiners to produce a 'rating', which ranks the bank in terms of its financial performance. Underlying the model is the assumption that bank performance is determined by five orthogonal variables (the five letters of its name).

To assess the performance of banks in our sample in 1998, we conducted a principal component analysis to 21 performance variables in an attempt to identify new uncorrelated variables that maximize the explained variance in the data.[501] Table 4.6 describes the 21 variables used in the analysis. Data was drawn from our database.

Table 4.4
Variable Definition

Code	Variable	Definition
v1	Size	1997-1998 Average Total Assets
v2	Asset Structure$_1$	Average Credit (gross) / Average Total Assets
v3	Asset Structure$_2$	(Average Trading Portfolio + Average Financial Investments) / Average Total Assets
v4	Off-Balance-Sheet	Commissions / Total Income
v5	Liquidity	Average Cash & Equivalents / Average Short-Term Liabilities
v6	Resources-to-Credit Conversion Rate	Average Credit (gross) / Average Operating Funding
v7	Capital Intensity	Depreciation / Total Costs
v8	Financial Margin	(Interest Income – Interest Expense) / Average Earning Assets
v9	Operating Costs-to-Banking Product	Operating Costs / Banking Product
v10	Average Assets per Employee	Average Total Assets / Number of Employees
v11	Banking Product per Employee	Banking Product / Number of Employees
v12	Credit Risk	Provisions / Credit Portfolio
v13	Interest Rate Risk	Net Interest Income / Average Earning Assets
v14	ROA	Operating Income / Average Total Assets
v15	ROE	Net Income / Average Equity Capital
v16	Non-Debt Tax-Shields	(Depreciation + Provisions) / Total Costs
v17	Implicit Tax Rate	Income Tax / Earnings before Taxes
v18	Tier 1-to-Total Capital	Average Equity Capital / Total Capital
v19	Capital Ratio	Average Equity Capital / Average Total Assets
v20	Tier 1 + Tier 2 –to-Total assets	Average Equity Capital + (Subordinated Debt + provisions) / Average Total Assets
v21	Debt-to-Equity	Average Debt Financing / Average Equity Capital

technique that can systematically summarize large correlation matrices is clearly needed."

[499] Flannery and Houston (1996) find that the likelihood of a bank being examined is significantly and negatively related to its capital ratio. They document that larger banks are more likely to be examined.

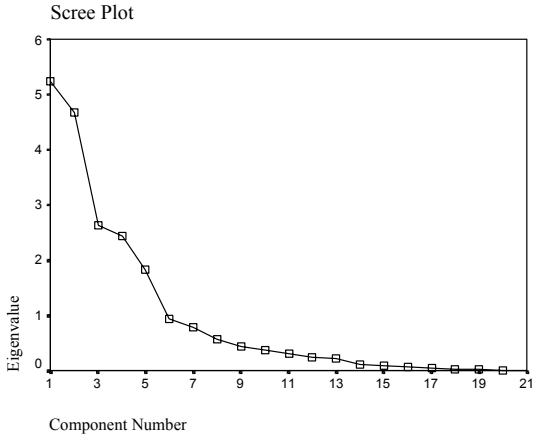
[500] CAMEL stands for Capital. Assets, Management, Earnings and Liquidity.

[501] Sharma (1996, 58) proclaims the appropriateness of using the principal components analysis "in determining the financial health of firms in a given industry" as an illustration of the paradigmatic application of the technique. See Appendix 4.6 for a methodological note.

Our principal components analysis explained 80.1 percent of the variance (see Appendix 4.7 'total variance explained' and 'component matrix' tables). Adopting the usual criteria (see Appendix 4.6) we retained five components. Figure 4.3 shows the *scree plot* which graphically explains that component number five is the last with an eigenvalue larger than one.

The first component explained 24.9 percent of the variance. Communalities larger than 0.70 in the first component include the following variables: v10, v16, v7, v3. We associate this component with bank *asset structure*. Our second component accounted for 22.3 percent of the variance. Communalities larger than 0.70 in the second component include the following variables: v19, v20, and v18. We interpret this component as being related with bank *capital*. The third component explained 12.5 percent of the variance.

Figure 4.3



Communalities larger than 0.70 in the third component include the following variable: v17. This component appears to be linked to *tax* management. The fourth component explained 11.6 percent of the variance. Communalities larger than 0.70 in the fourth component include the following variables: v13. We interpret this component as being associated with *profitability*. Finally, the fifth component of our analysis explained 8.7 percent of the variance. Communalities larger than 0.70 in the fifth component include the following variable: v12. In our view this component is associated to *credit risk* management. None of the remaining components explained more than 5 percent.

In summary, the results of our principal components analysis suggests that bank performance in 1998 might have been affected by asset structure, capital, tax management, profitability and credit risk. ■

Appendix 4.1

Milestones of the Portuguese Financial System Modernization Process[a]

Year	Month	Summary
1984	February	• Banking is reopened to private ownership.
1985	May/July	• Mutual funds and fund management rules are approved.
	August	• Treasury Bills are created. • Participating Bonds are regulated. • Interest rates are liberalized: minimum rates are set for over 180 days term deposits, and maximum rates are set to 90 to 180 days and over two years banking credit. • Regulation of Pension Funds and Pension Funds management.
	October	• The foreign exchange spot market is introduced.
1986	January	• The charter of Banco de Portugal is revised and a new instrument is created to conduct open market policy – Monetary Regularization Securities (TRM).
	February	• Venture capital is regulated.
	June	• Money market brokers are allowed to establish and operate in the interbank market.
	October	• The privatization of state owned banks is made possible. Amendment to the charter of UBP, paving the way for its privatization.
	December	• Banks are allowed to invest in the international money market and forward exchange transactions are liberalized. Banks are allowed to engage in forward exchange transactions with their clients, the Banco de Portugal and their peers.
1987	February	• Operations in the forward exchange market start. Only Portugal resident banks are allowed to participate in this market. • Certificates of Deposit are created.
	August	• Rules and regulations for the Interbank securities market (MIT) are changed as to allow the BP to absorb excess liquidity and formally introduce an open market policy.
	October	• The Foreign Exchange market is liberalized. The exchange rate stops being established by BP and financial institutions are allowed to trade freely although under strict supervision from the Central Bank. • Security markets regulations are changed in order to foster the development of Stock Exchanges. The National Council of Stock Exchanges is re-established and a Securities Exchange Auditor is established to deal with all maters related to the securities markets. Later, the Securities Exchange Auditor would give way to the Securities Exchange Commission.
	November	• Issues of fixed rate treasury bonds are launched for the first time. Maturity varies between 18 and 36 months. These securities are freely traded in secondary markets.
1988	February	• CLIPs (revolving credit facilities to the public sector) are introduced.
	July	• Major changes related to the modernization of the Security Markets, mainly: — Bonds with warrants are introduced; — Dematerialized equity securities are introduced; — Initial Public Offerings and Public Offers of Acquisition are regulated; — Closed-end funds are introduced. • Interbank money market brokers are allowed to operate in the Foreign Exchange Market; • Banks are allowed to own brokerage and dealing houses. • The charter of BNU is changed, paving the way for its privatization.
	September	• Limits on banking credit rates are fully removed.
	October	• The charter of BTA is changed, paving the way for its privatization.
1989	January	• A minimum limit of 3,5 billion PTE for banks' equity capital is established.
	March	• The ceiling on check deposits is raised up to one third of the minimum rate on term deposits under 180 days.
	April	• The charter of UBP is changed, allowing its privatization.
	June	• The charter of BTA is changed, allowing its privatization.
	December	• The charter of Banco de Fomento Nacional was altered. Denomination changed for Banco de Fomento Exterior.
1990	March	• Limits on banking credit are fully eliminated.
	April	• A Privatization law is passed (Law No. 11/90), allowing the privatization of at most 49% of the equity capital of companies nationalized after 1974.
	June	• Investment in foreign securities markets is allowed.
	September	• The charters of CPP, BFB, BPSM e BESCL are changed allowing its privatization. • The Portuguese Escudo starts being monitored against the currencies of the ERM.
	October	• Non-residents are allowed to buy foreign currency in the forward exchange market. Nevertheless, restrictions on the selling of foreign exchange against escudos to residents are kept in place. • The charter of BPA is changed, allowing its privatization.
	December	• Capital adequacy requirements were introduced.
1991	January	• Leasing is authorized to expand into real estate financing.
	February	• Foreign Exchange market is regulated.
	March	• Brokers and dealers were allowed to offer securities custody services.
	April	• The Securities Exchange Code is approved. • Transitory fiscal benefits are established to foster the development of the Securities Exchanges.
	July	• The Securities Exchange Commission and its internal regulations are formally approved
1992	March	• The EEC Directive No. 86/635/CEE transposed to the Portuguese legal system accounting consolidation principles and rules for financial institutions.
	April	• Portuguese escudo enters the ERM of EMU.
	May	• Deposit rates are liberalized.
	August	• Control of capital movements are eliminated and capital flows completely liberalized. • The issuance of Commercial Paper is regulated.
1993	July	• New rules are introduced into the functioning of the interbanking money market

[a] See list of acronyms in Appendix 4.4.

Appendix 4.2

Table A - *Schedule of Portuguese Banks Privatization*

Banks	Percentage Sold	Method	Date
• Banco Totta & Açores (BTA)			
1st tranche	49.0	Public offer	March and July 1989
2nd tranche	31.0	Public offer	July 1990
3rd tranche	3.1	Public offer	November 1996
	10.2	Private Placement	
• Banco Português do Atlântico (BPA)			
1st tranche	33.0	Public offer	December 1990
2nd tranche	17.6	Public offer	May 1992
3rd tranche	17.5	Public offer	July 1993
4th tranche	7.5	Direct sale	March 1994
5th tranche	24.4	Direct sale	March 1995
• Sociedade Financeira Portuguesa (SFP)[a]	100.0	Public offer	May 1991
• Banco Espírito Santo & Comercial de Lisboa (BESCL)			
1st tranche	40.0	Public offer	July 1991
2nd tranche	60.0	Public offer	February 1992
• Banco Fonsecas & Burnay (BFB)			
1st tranche	80	Public tender	August 1991
2nd tranche	20	Public offer	July 1992
• Banco Internacional do Funchal (BANIF)	16.0	Public offer	November 1992
• Crédito Predial Português (CPP)	100.0	Public offer	December 1992
• União de Bancos Portugueses (UBP)[b]			
1st tranche	61.1	Public offer	February 1993
2nd tranche	20.0	Direct sale	July 1995
• Banco de Fomento e Exterior (BFE)			
1st tranche	19.5	Public offer	December 1994
2nd tranche	65.0	Public tender	August 1996
• Banco Pinto & Sotto Mayor (BPSM)			
1st tranche	80.0	Public tender	November 1994
2nd tranche	20.0	Public offer	March 1995
• Banco Comercial dos Açores (BCA)			
1st tranche	56.0	Public tender	August 1996
2nd tranche	10.0	Public offer	December 1996

Sources: Decressin and Mauro (1998), Associação da Bolsa de Derivados do Porto (1996), Sousa and Cruz (1995) and various issues of "Diário da República."

[a] Changed its denomination to Banco Mello S.A. In June 28, 1996 was altered to 28 Banco Mello Investimentos, S.A.

[b] In June 28, 1996 changed its denomination to Banco Mello Comercial, S.A.

Table B - *Chronology of Portuguese Banks Privatization*

1989	March, July	• Banco Totta & Açores, 1st tranche.
1990	July	• Banco Totta & Açores, 2nd tranche.
	December	• Banco Português do Atlântico, 1st tranche.
1991	July	• Banco Espírito Santo & Comercial de Lisboa, 1st tranche.
	May	• Sociedade Financeira Portuguesa.
	August	• Banco Fonsecas & Burnay, 1st tranche.
1992	February	• Banco Espírito Santo & Comercial de Lisboa, 2nd tranche.
	May	• Banco Português do Atlântico, 2nd tranche.
	July	• Banco Fonsecas & Burnay, 2nd tranche.
	November	• Banco Internacional do Funchal.
	December	• Crédito Predial Português.
1993	February	• União de Bancos Portugueses, 1st tranche.
	July	• Banco Português do Atlântico, 3rd tranche.
1994	March	• Banco Pinto & Sotto Mayor, 1st tranche.
		• Banco Português do Atlântico, 4th tranche.
	December	• Banco de Fomento e Exterior, 1st tranche.
1995	March	• Banco Português do Atlântico, 5th tranche.
		• Banco Pinto & Sotto Mayor, 2nd tranche.
	July	• União de Bancos Portugueses, 2nd tranche.
1996	August	• Banco Comercial dos Açores, 1st tranche.
		• Banco de Fomento e Exterior, 2nd tranche.
	November	• Banco Totta & Açores, 3rd tranche.
	December	• Banco Comercial dos Açores, 2nd tranche.

Appendix 4.3

Banks Affiliated with the Portuguese Banking Association (1989-1998)[a]

1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
_	ABN	ABN	ABN	ABN	ABN	ABN	ABN	ABN	ABN
_	_	_	_	_	_	_	_	ARB	ARB
_	_	_	_	_	_	_	_	_	AGT
_	_	_	_	_	_	_	_	_	BAI
BANIF	BANIF	BANIF	BANIF	BANIF	BANIF	BANIF	BANIF	BANIF	BANIF
BARCLAYS	BARCLAYS	BARCLAYS	BARCLAYS	BARCLAYS	BARCLAYS	BARCLAYS	BARCLAYS	BARCLAYS	BARCLAYS
BBR	BBR	BBR	BBR	BBR	BBR	BBR	BBR	BBR	BBR
BBI	BBI	BBI	BBI	BBI	BBI	BBI	BBI	BBI	BBI
_	BBV	BBV	BBV	BBV	BBV	BBV	BBV	BBV	BBV
BCA	BCA	BCA	BCA	BCA	BCA	BCA	BCA	BCA	BCA
BCI	BCI	BCI	BCI	BCI	BCI	BCI	BCI	BCI	BCI
_	BCM	BCM	BCM	BCM	BCM	BCM	BCM	_	_
BCP	BCP	BCP	BCP	BCP	BCP	BCP	BCP	BCP	BCP
BES	BES	BES	BES	BES	BES	BES	BES	BES	BES
_	_	_	_	BESSI	BESSI	BESSI	BESSI	BESSI	BESSI
_	BEX	BEX	BEX	BEX	BEX	BEX	BEX	BEX	BEX
BFB	BFB	BFB	BFB	BFB	BFB	BFB	BFB	BFB	BFB
BFN	BFE	BFE	BFE	BFE	BFE	BFE	BFE	BFE	BFE
BIC	BIC	BIC	BIC	BIC	BIC	BIC	BIC	BIC	BIC
_	_	_	_	BII	BII	BII	BII	BII	BII
_	_	BNC	BNC	BNC	BNC	BNC	BNC	BNC	BNC
_	_	_	_	BNI	BNI	BNI	_	_	_
BNP	BNP	BNP	BNP	BNP	BNP	BNP	BNP	BNP	BNP
BNU	BNU	BNU	BNU	BNU	BNU	BNU	BNU	BNU	BNU
_	_	_	_	_	_	_	_	_	BOSTON
_	_	_	BOT	BOT	BOT	BOT	BOT	BOT	BOT
BPA	BPA	BPA	BPA	BPA	BPA	BPA	BPA	BPA	BPA
BPI	BPI	BPI	BPI	BPI	BPI	BPI	BPI	BPI	BPI
_	_	_	_	_	_	_	_	BPI,SGPS	BPI,SGPS
_	_	_	_	_	_	_	_	_	BANCO BPI
_	_	_	_	BPN	BPN	BPN	BPN	BPN	BPN
_	_	_	_	_	_	_	_	BPP	BPP
BPSM	BPSM	BPSM	BPSM	BPSM	BPSM	BPSM	BPSM	BPSM	BPSM
_	_	_	_	BSN	BSN	BSN	BSN	BSN	BSN
BTA	BTA	BTA	BTA	BTA	BTA	BTA	BTA	BTA	BTA
_	_	_	_	_	CCCAM	CCCAM	CCCAM	CCCAM	CCCAM
_	_	_	_	_	_	_	_	CENTRAL	CENTRAL
_	_	_	_	_	_	_	_	_	CETELEM
_	BTQ	BTQ	BTQ	BTQ	_	_	_	_	_
CGD	CGD	CGD	CGD	CGD	CGD	CGD	CGD	CGD	CGD
_	CMCAL	CMCAL	CMCAL	CMCAL	CMCAL	CMCAL	CMCAL	CMCAL	CMCAL
_	_	_	_	CISF	CISF	CISF	CISF	CISF	CISF
CITI	CITI	CITI	CITI	CITI	CITI	CITI	CITI	CITI	CITI
CL	C L	C L	C L	C L	C L	C L	C L	C L	C L
CPP	CPP	CPP	CPP	CPP	CPP	CPP	CPP	CPP	CPP
_	_	_	_	_	CDB	CDB	CDB	CDB	CDB
_	DBI	DBI	DBI	DBI	DBI	DBI	DBI	DBI	DBI
_	_	_	_	_	_	_	EFISA	EFISA	EFISA
_	_	_	_	_	_	_	_	_	BEA
_	_	_	_	FINANTIA	FINANTIA	FINANTIA	FINANTIA	FINANTIA	FINANTIA
_	_	_	_	FNB	FNB	FNB	FNB	FNB	FNB
GNL	GNL	GNL	GNL	GNL	GNL	GNL	GNL	GNL	GNL
_	HPN	HPN	HPN	HPN	_	_	_	_	_
_	_	_	_	_	_	_	_	_	IMIBANK
_	_	_	_	_	_	_	_	INTERBANCO	INTERBANCO
_	_	_	_	_	ITAÚ	ITAÚ	ITAÚ	ITAÚ	ITAÚ
UBP	UBP	UBP	UBP	UBP	UBP	UBP	MELLO	MELLO	MELLO
_	_	_	_	_	_	_	MELLO imob.	MELLO imob.	MELLO imob.
_	MELLO	MELLO	MELLO	MELLO	MELLO	MELLO	MELLO Inv.	MELLO Inv.	MELLO INV.
M G	M G	M G	M G	M G	M G	M G	M G	M G	M G
_	_	_	_	_	SBL	SBL	SBL	SBL	SBL
_	_	_	_	_	_	_	_	_	SANTANDER
CHASE	CHASE	CHASE	_	_	_	_	_	_	_
MNF	MNF	MNF	_	_	_	_	_	_	_
LLOYDS	_	_	_	_	_	_	_	_	_

[a] See list of acronyms in Appendix 4.4.

Appendix 4.4

List of Bank Acronyms

ABN	ABN AMRO Bank, N.V.
ARB	Banco Alves Ribeiro
AGT	Banco de Negócios Argentaria
APB	Associação Portuguesa de Bancos
BAI	Banco Africano de Investimentos
BANIF	Banco Internacional do Funchal
BARCLAYS	Barclays Bank
BBR	Banco do Brasil
BBI	Banco Borges & Irmão
BBV	Banco Bilbao Viscaia
BCA	Banco Comercial dos Açores
BCI	Banco Comércio e Indústria
BCM	Banco Comercial de Macau
BCP	Banco Comercial Português
BEA	Banco Expresso Atlântico
BES	Banco Espírito Santo e Comercial de Lisboa
BESSI	Banco Espirito Santo de Investimento
BEX	Banco Exterior de Espanha
BFB	Banco Fonsecas & Burnay
BFE	Banco de Fomento e Exterior [a]
BIC	Banco Internacional de Crédito
BII	Banco Investimento Imobiliário
BNC	Banco Nacional de Crédito Imobiliário, SA
BNI	Banco Nacional de Investimento
BNP	Banque Nationale de Paris
BNU	Banco Nacional Ultramarino
BOSTON	Bank Boston Latino Americano
BOT	Bank of Tokyo-Mitsubishi
BP	Banco de Portugal
BPA	Banco Português do Atlântico
BPI	Banco Português de Investimento
BANCO BPI	Banco BPI
BPN	Banco Português de Negócios
BPP	Banco Privado Português
BPSM	Banco Pinto Sotto Mayor
BSN	Banco Santander de Negócios
BTA	Banco Totta & Açores
CCCAM	Caixa Central de Crédito Agrícola Mútuo
CENTRAL	Central - Banco de Investimento
CETELEM	Banco Cetelem
CGD	Caixa Geral de Depósitos
CMCAL	Chemical
CISF	Banco CISF
CITI	Citibank International
C L	Credit Lyonnais
CPP	Crédito Predial Português
CDB	Credibanco
DBI	Deutsche Bank de Investimento, SA
EFISA	Banco Efisa
FINANTIA	Banco Finantia
FNB	Finibanco
GNL	GENERALE
HPN	Hispano
IMIBANK	SANPAOLO IMI BANK
INTERBANCO	Interbanco
ITAÚ	Banco Itaú Europa, SA
MELLO	Banco Mello Universal [b]
MELLO imob.	Banco Mello Imobiliário
MELLO Inv.	Banco Mello Investimento
MG	Montepio Geral
SBL	Sabadell
SANTANDER	Banco Santander Portugal, Sa
CHASE	Chase Manhattan Bank
MNF	Manufactors Hanover
LLOYDS	Lloyds Bank

[a] Designated as "Banco de Fomento Nacional" until 1989.

[b] Designated as "União de Bancos Portugueses" until 1996.

Appendix 4.5

We must recognize that the major stream of theoretical and empirical research in banking is produced in the U.S. Nonetheless, as noted by Barth, Nolle and Rice (1997), North American and Japanese banks significantly different from their counterparts in continental Europe. The most striking differences include market structure, regulatory and supervisory environment, deposit insurance regime, and accounting rules and practices. In order to shed some light on this last aspect we appended this table.

Illustrative Comparison between Portuguese and U.S. General Accepted Accounting Practices (GAAP)

Topic	Portuguese GAAP	U.S. GAAP
Revaluation of fixed tangible assets	Under the discretion of the legislator, Portuguese GAAP allow firms to revalue their tangible fixed assets to reflect the impact of inflation. Depreciation of tangible assets is computed on the revalued amounts, with the original acquisition cost and 60% of the revaluation increment being deductible for corporate income tax purposes.	Under U.S. GAAP, tangible fixed assets may not be stated at more than their historical acquisition cost.
Research and development (R&D) costs, notably product development	As a general principle, R&D costs may be included as expenses in the period incurred. However, capitalization and amortization of such costs is a common practice which is allowed if specific requirements are met. Such requirements appear to be less stringent than the U.S. GAAP regime.	U.S. GAAPs require R&D costs that they be expensed in the period incurred. Some costs related to R& D activities, however, are properly capitalized and carried forward as assets if they have alternative future use. In these instances the appropriate amortization schedule applies.
Goodwill **(**Related to acquisitions accounted by 'purchase method')	Under Portuguese accounting principles, positive goodwill may be either amortized over its estimated life, which cannot exceed 40 years, or credited to reserves. Whatever the procedure, income tax deductibility is not allowed. Goodwill is always deducted in terms of the regulatory solvency ratio, no matter the criteria adopted for its accounting.	Under US GAAP, positive goodwill is capitalized and amortized over its estimated life, which may not exceed 40 years. Income tax treatment is similar to Portuguese regime.
Compensation Plans **(**As part of its profit-sharing plan, banks customarily distribute a portion of its net income to management and employees)	Profit-sharing plan distribution: 1) is reflected in the period in which formal shareholder approval is obtained and is recorded as a reduction of retained earnings or other reserves or 2) is recorded as compensation expense in the period to which they relate. Is always deductible in terms of income tax.	U.S. GAAP requires that such distributions be recorded as compensation expense in the period to which they relate.
Income taxes	It is acceptable to recognize income tax expense based upon the estimated current income tax liability on the current year's earnings. When income and expense recognition for income tax purposes does not occur in the same period as income and expense recognition for financial reporting purposes, the resulting temporary difference is not considered in the computation of the income tax expense for the period.	Income taxes are provided using the liability method, which requires the recognition of deferred tax assets and liabilities for the expected future tax consequences attributable to differences between the financial statement carrying amount of assets and liabilities and their tax bases. A valuation allowance is provided based on the expected realization of these deferred tax assets.
Consolidation Rules	When equity stakes are more than 50 percent or between 20-50 percent there are no meaningful differences between Portuguese and U.S. consolidation rules. Investments in unconsolidated subsidiaries are reported using the equity method of accounting. Equity stakes less than 20 percent are accounted at cost. Unrealized losses are provisioned. Whenever a parent-company (or any subsidiary) has joint control (with other firm(s) not included in its consolidation perimeter) of a firm, consolidation is made under the proportional consolidation method.	When equity stakes are more than 50 percent or between 20-50 percent there are no meaningful differences between Portuguese and U.S. consolidation rules. Investments in unconsolidated subsidiaries are reported using the equity method of accounting. Equity stakes less than 20 percent are reported at fair value.

Appendix 4.6

Principal Components Analysis: A Methodological Note

Principal components analysis (PCA) is an exploratory multivariate statistical technique that linearly transforms correlated variables of an original large data set, reducing its dimensionality to a smaller number of mutually orthogonal (uncorrelated) components (e. g., Joliffe 1986).[502] These linear functions of the original variables aim at accounting as much of the variation in the original set as possible.[503] Hence, PCA is a descriptive multivariate statistical technique for analyzing relationships that may exist among a set of quantitative variables and, therefore, useful in understanding existing dependencies among those variables and also in determining whether subsets of variables cluster, or go with one another.[504]

Employing the PCA as an exploratory method to describe a set of variables does not require defining any distributional assumptions (see, e.g., Timm 1975, 542). Nevertheless, it is presumed that (1) all variables to be measured at the numerical level; and (2) relationships between pairs of variables are linear.

Since PCA purpose is the reduction original data set while maximizing the explanation as much of the variation as possible in the original data set, then a crucial step in a principal components analysis relates to the choice about the number of components to retain. In deciding on how many components to retain, two main methods are suggested in the literature: (1) *Kaiser's* (1960) *criterion*; and (2) *Cattell's* (1966) *graphical scree test*. The first one suggests the selection of those components that account an eigenvalue greater than one. Stevens (1996) suggest the use of Kaiser's (1960) criterion under the following conditions: Less than 30 variables and communalities below 0.70, or when N > 250 and the mean communality is ≥ 0.60. "The choice of criterion may depend on the size of the communalities and the number of variables and

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[502] It should be noted that, by its descriptive statistical nature, hypothesis testing is unavailable under principal component analysis. Thus, the examination or interpretation of *components* cannot lead to rigorous conclusions regarding support for or against a given theoretical proposition.

[503] As argued by Stevens (1996, 383) "[i]n principal components analysis we simply transform the original variables into linear combinations of these variables." The new variables — principal components — are formed, in decreasing order of importance, so that: (1) they are uncorrelated; (2) the first principal component accounts for as much of the variability in the data as possible; and (3) each succeeding component accounts for as much of the remaining variability as possible.

[504] See, e.g.,, Joliffe (1986) for a detailed and rigorous analytical discussion of the principal components analysis method.

participants. The Kaiser criterion has been recommended for situations where the number of variables is less than 30 and the average communality is grater than 0.70 or when the number of participants is greater than 250 and the mean communality is greater than or equal to 0.60 (Stevens 1996)" (Bryman and Cramer 1999, 277). The second method, graphically, depicts the descending variance accounted for by the components initially extracted. The components "to be retained are those which lie before the point at which eigenvalues seem to level off" (Bryman and Cramer 1999, 277).

Appendix 4.7.

Principal Components Analysis Results

Table A - Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5,239	24,948	24,948	5,239	24,948	24,948
2	4,677	22,273	47,221	4,677	22,273	47,221
3	2,634	12,544	59,765	2,634	12,544	59,765
4	2,444	11,637	71,401	2,444	11,637	71,401
5	1,819	8,662	80,063	1,819	8,662	80,063
6	,926	4,411	84,474			
7	,772	3,677	88,151			
8	,564	2,687	90,838			
9	,439	2,093	92,931			
10	,370	1,760	94,691			
11	,298	1,419	96,110			
12	,248	1,182	97,293			
13	,220	1,049	98,341			
14	,117	,556	98,898			
15	8,861E-02	,422	99,320			
16	6,142E-02	,292	99,612			
17	4,613E-02	,220	99,832			
18	1,828E-02	8,704E-02	99,919			
19	1,153E-02	5,491E-02	99,974			
20	3,148E-03	1,499E-02	99,989			
21	2,346E-03	1,117E-02	100,000			

Extraction Method: Principal Component Analysis.

Table B - Component Matrix

Variable	Component				
	1	2	3	4	5
V1	5,266E-02	-,400	,308	-,133	,469
V2	,646	-,570	9,098E-03	-3.493E-02	-,449
V3	-,708	,384	-,145	,115	,482
V4	-,186	,675	,505	-,127	1,852E-02
V5	,295	,490	,389	-,623	-5.339E-02
V6	,375	-,618	,216	,464	-1.143E-02
V7	,712	8,084E-02	,352	-,445	-,155
V8	,851	7,017E-02	8,911E-02	,447	-,113
V9	,392	,130	-,607	-,219	,361
V10	-,822	-6.968E-02	,102	,370	-,163
V11	-,646	,322	,495	,284	-5.180E-02
V12	,513	8,225E-03	-,227	,187	,638
V13	,399	-2.332E-02	-,286	,753	9,916E-02
V14	,487	,391	,491	,526	6,043E-02
V15	1,433E-02	-,450	,489	-4.792E-02	,500
V16	,760	,132	,372	9,623E-02	1,422E-02
V17	-,265	-,250	,720	,105	,131
V18	6,879E-02	,725	-,200	7,044E-02	-,365
V19	,117	,911	-2.144E-03	,234	-8.497E-02
V20	9,831E-02	,857	-2.140E-02	,273	,128
V21	-,492	-,553	4,651E-03	,303	-,349

Extraction Method: Principal Component Analysis.
5 components extracted.

Chapter 5

Portuguese Banks' CEOs Capital Structure Decisions: Empirical Evidence (1989/1998)

CHAPTER 5 - Portuguese Banks' CEOs Capital Structure Decisions: Empirical Evidence (1989/1998)

The scientific method for deciding among competing theories is, of course, to subject them to a controlled experiment — or, in the case of research in finance, empirical testing. In the matter of leverage and dividend policy, however, designing broad-based tests of actual corporate decision-making that would allow us to distinguish among these theories has proven to be quite difficult. The dearth of reliable empirical evidence on this topic has forced proponents of each theory to rely largely on anecdotes to buttress their arguments.

Michael Barclay, Clifford Smith and Ross Watts, "The Determinants of Corporate Leverage and Dividend Policies," *Journal of Applied Corporate Finance* 1995

5.1. INTRODUCTION

This investigation is primarily concerned with gathering evidence to allow the establishment of an empirical link between testable propositions in the form of survey questions, and capital structure theory of the banking firm. More specifically we aim at, using survey responses of a sample of banks' Chief Executive Officers (CEOs), to document preferences for capital structure policy models, and to uncover the empirical relevance of determinants of Portuguese banks' *voluntary* capital structure choice. Thus, we are interested in establishing a link between the general theory of corporate capital structure (discussed in Chapter 2) adopted to the idiosyncrasies of banks (as discussed in chapter 3) and the structure of motives involved in debt / equity choices made by Portuguese banks' CEOs during the 1989-1998 time period.

This survey-based empirical examination was conducted on the format of a face-to-face interview survey — supported by a structured questionnaire (see Annex 1 and 2) — and was administered to a sample of 51 bank CEOs who were in office during some or all of the 1989-1998 period. The questionnaire's structure and design was based on the theoretical discussion of the problem of capital structure of the banking firm developed in chapter 3.[505]

[505] As we point out on page 102 of the dissertation "The examination performed in this chapter focus on the capital structure problem in a banking habitat, and aims at being the theoretical foundation of our empirical investigation. More specifically, of the set of testable propositions embedded in the survey instrument."

Testable propositions concerning the determinants and the policy models of Portuguese banks' CEOs capital structure decision-making were framed in the questions composing the survey questionnaire.

In order to try making this chapter more reader-friendly we opted for formulating the hypotheses on a question-by-question basis rather than presenting them as an autonomous theoretical model. We discuss the theoretical motivation of the survey instrument, i.e. its content validity,[507] in section 5.6. The establishment of that theoretical validity, i.e., showing survey questions theoretical grounding to capital structure theory, was attempted through an examination of the theoretical foundations of testable hypotheses, which is presented on a question-by-question basis.[508] That discussion provides the conceptual foundation of the theoretical model underlying our survey investigation.

Although the potential benefits this presentation layout may ease the reading of the part of the dissertation, we admit that it might not favor an overall perception of theoretical scope of the investigation. In order to try to overcome this potential shortcoming we present a summary of the theoretical framework underlying the questionnaire by identifying testable propositions, and their correspondence to questions included in the survey instrument (see table in Appendix 5.1).

The remainder of the chapter is organized as follows: the next section discusses a few general methodological problems associated with financial economics research at large. Some of the more troublesome problems typically surfacing in empirical tests of corporate capital structure are also addressed.[509] The rationale and the motivation of the research design are discussed next. The following section specifically addresses the description of research design followed by a discussion of some of the problems typically associated with survey-based research. The survey design is then described. The final section deals with issues related to statistical testing of survey data, elaborate on

[507] See section 5.5 for a discussion of content validity issues.
[508] Whenever appropriate we also declared our expectations about the results in order to decide when to conduct one-tailed or two-tailed statistical tests.
[509] In this section we also lay down thoughts and concerns about the issue of scientific inquiry in general, and in this particular research. In addition, we discuss arguments that support it in both ontological and epistemological grounds. These assertions are the philosophical foundations of the research design of the investigation.

propositions included in survey questions, presents and discuss results on a question-by-question basis.

5.2. METHODOLOGY AND METHOD ISSUES

Philosophical inquiry in science has taken the form of a long and ongoing debate. In financial economics, as suggested by Frankfurter and McGoun (1996, 4), "[w]hat there is to know (ontology) and how it is known (epistemology)" remain intriguing but unanswered questions.[510]

Efforts to improve knowledge about finance phenomena have occupied scholars and the 'best' ways to conduct scientific research (methodology) remains a continuing source of controversy.[511] Two dominant paradigms have emerged in economic research from this controversy — the *normative*[512] and the *positive*[513] approaches.[514]

The literature of financial economics in general and capital structure in particular, is not insulated from the debate surrounding these research methodological matters. Whether or not research in financial economics can follow the traditional scientific method is a recurring question. The question seems appropriate since research hypotheses in

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[510] See also, e.g., Ryan, Scarpes and Theobald (1992), Morgan (1988) and Weston (1964) and Peter Tufano's introductory remarks to the *Harvard Business School* / *Journal of Financial Economics* conference on 'Complementary Research Methodologies: The Interplay of Theoretical, Empirical and Field-Based Research in Finance'.

[511] We share Blaug's (1992) view that "*methodology* is not just a fancy name for 'methods of investigation'"(emphasis in the original). Frankfurter and McGoun (1996, 3) argue that methodology is used "most often as a synonym for method, to refer to the technique of data acquisition and analysis in research, when it should instead refer to the underlying philosophy and logical structure of the process."

[512] A *normative* theory uses deductive reasoning to develop a logical set of rules as corporate capital structure decisions might be appraised. As Jensen (1983, 2) points out "answers to normative questions always depend on the choice of the criterion or objective function which is a matter of values. Therefore, normative propositions are never refutable by evidence." A normative theory examines characteristics, relationships, and actions that should exist. The important point is that normative theories are not necessarily empirically based. Rather, such theories rely on deductively plausible analysis of human behavior and/or expected consequences of actions.

[513] The *positive* approach to the study of economic phenomena attempts to describe what actually happens in reality, its findings derive from actual observation of real-world behavior, i.e., it is inductively established. Jensen (1983, 2) suggests that "answers to positive questions […] involve discovery of some aspect of how the world behaves and are always potentially refutable by contradictory evidence."

[514] According to Patton (1990) the essence of the discussion has been centered "on the relative value of two fundamentally different and competing inquiry paradigms: (1) logical-positivism, (2) phenomenological inquiry." The former "uses quantitative and experimental methods to test hypothetical-deductive generalizations" (Ibid.). The latter "Uses qualitative and naturalistic approaches to inductively and holistically understand human experience in context-specific settings" (Ibid.).

financial economics cannot be subjected to repeat testing under stringent control conditions.

Financial economics research is also subject to other epistemological problems. Among them, one is related to the possibility of generalizing the empirical results;[515] another is linked to the ability of existing theoretical models to yield testable predictions consistent with research methods currently available.[516]

There is a broad agreement that empirical investigation must subject actual data to rigorous testing in order to confirm or refute research hypotheses.[517] Because results of a single test are hardly conclusive, replication is usually needed to confirm the findings of previous work. Thus, hypotheses are never fully confirmed, although they may be denied. To deny a hypothesis, one has to find a single instance in which it fails to apply.[518] To confirm a hypothesis, however, it must perform as predicted in all conceivable environments. In practice, once a hypothesis has been upheld in many tests, one can then say that the hypothesis has been affirmed.[519]

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[515] "The relevance of the falsifiability requirement is critically central to the historical evolution of the financial theories of the capital structure and the cost of capital. In this subset of financial economics, there has been a tendency to replace one theory by another because the latter could rationalize better data from a more recent sample period. This replacement has been achieved by leaving earlier facts unexplained or same issues unresolved" (Frankfurter and McGoun 1996).

[516] Allen and Morris (1998, 9) suggest that "[t]he inability of standard finance theories to provide satisfactory explanations for observed phenomena lead to a search for theories using new methodologies. This was particularly true in corporate finance where the existing models were so clearly unsatisfactory". As Titman and Wessels (1988, 1) point out, capital structure empirical studies "has lagged behind theoretical research, perhaps because the relevant firm attributes are expressed in terms of fairly abstract concepts that are not directly observable."

[517] In this approach, the issue to be investigated is developed into a testable hypothesis. When testable hypotheses are formulated, relevant data is collected and processed in some experimental framework. Finally the results are evaluated. If results of the experiment are consistent with predictions, the hypothesis is said to be accepted; if the results are in opposition to predictions, it is rejected.

[518] Under the "[…]logical positivist doctrine […] the acceptability of a theory depends on its verifiability or falsifiability" (Stiglitz 1989, note 5). There is an intense debate about the role empirical testing plays on theory confirmation (refutation). Competing concepts include Popper-Samuelson's *falsificationism* (embraced by Mark Blaug), Caldwell's (1982) *confirmationism*, and Hausman's (1989) *deductivism* (called *verificationism* by Blaug (1992, xvi). See Blaug (1992) and Caldwell (1982) for interesting discussions on the topic.

[519] According to Stiglitz (1989, 345) "[t]here is a peculiar perversion of the positivist doctrine that was popularized by Milton Friedman, which held that the validity of a theory depended not on the reasonableness of the assumptions but on the verification of the implications of the theory. This view has been extended by some to suggest that a theory is a good theory if any of its implications are verified. This is sheer nonsense. For a theory to be verified requires that none of its implications be falsified."

However, if environmental conditions underlying the object of research cannot be experimentally replicated then we must be prepared to accept and interpret the findings without generalizing the results. In these circumstances, we should attempt *interpreting* the empirical reality rather than *explaining* it.[520]

Extant capital structure theoretical models have, so far, successfully incorporated a "large number of potential determinants of capital structure" choice (Harris and Raviv 1991, 299). However, we must recognize that empirical literature have not yet produced irrefutable evidence to validate the contextual relevance of such models which, depending on the observed reality and the research methods applied, are often a source of unconvincing and contradictory results.[521] This *état d'affaires* is a natural cause of disagreement among academics, as illustrated by Frankfurter and Philippatos' (1992, 3) claim that one of the central problems confronting corporate finance theories "is their weak correspondence to facts."[522]

One plausible explanation for this phenomenon may be the misalignment between the behavioral characteristics of financial choices available to firms and the theoretical microeconomic underpinnings of the *standard* neoclassical model of the firm, which represents a popular theoretical foundation for a number of corporate finance models.[523]

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[520] Barclay and Smith (1999) suggest that "the greatest barrier to (scientific) progress in solving the [capital structure] puzzle has been the difficulty of devising conclusive tests of the competing theories."

[521] Opler and Titman (1996) provide a suggestive illustration: "in dynamic models like Fischer, Heinkel and Zechner (1989), a firm issues equity after its share price declines and repurchases equity after its share prices increase to adjust towards an optimal capital structure. […] existing research indicates that firms actually do the opposite."

[522] Also Kochhar and Hitt (1998), and Barton and Gordon (1987, 1988), among others, recognize that financial economic theories could not yet provide a satisfactory comprehensive explanation for the firm's capital structure observed behavior.

[523] Resource allocation in the neoclassical theory, is a price-oriented objective, and the firm, like its management, does not play a central role in it. The theory is well known as a "black-box", because resources go into it and goods come out of it, with little attention paid to its transformation process. Behavioral features of firm's management plays no real role in this model, and consequently incentive problems and transaction costs are ignored. According to Hart (1995, 155) this "is a caricature of the modern firm" or, in a rhetorical metaphoric fashion, "[f]or a long time, the firm's appearance in economic models was anorexic: more bones than flesh" Hart (1988). Jensen (1983) argues in the same direction: "Unfortunately, the vast literature of economics that falls under the label of 'Theory of the Firm' is not a positive theory of the firm, but rather a theory of markets." As argued in Weston (1966): "important questions about the internal operations of the firm and the processes by which decisions are reached were never intended to be handled by the economic theory of the firm."

Moreover, an excessive emphasis on the *positivistic methodological*[524] approach to scientific inquiry into financial economics may have exacerbated the situation.[525]

The behavioral decision-making patterns of economic agents are a crucial element of economic analysis and a dividing line, particularly, between followers of the neoclassical economics doctrine and the supporters of behavioral economics. The former sees economic agents behaving as fully rational utility maximizers (i.e., maximizing their subjective expect utility in an uncertain economic environment). The latter argue that agents behavior is "*intendly* rational, but only *limitedly* so" (Simon 1957).[526] The neoclassical *expected utility hypothesis* — theory that characterizes the individual's utility-maximization behavior in consumption and investment activities — has been a cornerstone for economic empirical research (e.g., Simon 1997). However, within this setting, individual decision-making is driven by the presumption of (full) rationality, which requires them "to maximize utility in a world they either understand exactly or in terms of a known probability distribution (i.e., they are maximizing subjective expected utility)" (Simon 1997).[527] Supporters of the opposite view, like Herbert Simon, argue that economic agents have a *bounded rationality*.[528]

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[524] Among other presumptions the positivistic view assume that individuals will always act rationally. There is substantial evidence indicating that this may be not always the case. Therefore, this assumption ignores the power of other factors — such as, tradition, loyalty, and reputation — in human behavior.

[525] In this vein Scholes and Wolfson (1989) suggest that "to build a rich model of capital structure planning requires that we abandon a neoclassical perspective where transactions can be effected costlessly and information is freely and equally available to all participants in the market." Findlay and Williams (1985) argue that the source of the problem "lies in the philosophical framework of subverted positivism (which is, itself, a rather crude form of instrumentalism)." These authors add "it appears that available data and methodologies will allow researchers of one camp to not reject A, and those of another camp to not reject not A, indefinitely."

[526] A significant number of authors expressed their dissatisfaction concerning the focus on the neo-classical paradigm as a theoretical framework for research of firm economic phenomena. Among others, see Foster (1979), Grossman and Stiglitz (1980), Summers (1982), Williams and Findlay (1983, 1984, and 1986), and Findlay and Williams (1985, and 1987).

[527] Full rationality model of economic behavior implies that decision-makers have the ability to ascertain the probabilities of all possible payoffs, rank each possible decision outcome, and choose the course of action which maximizes the expected value. As Simon (1997) points out " neoclassical economics is right in finding the core of its subject in the act of rational decision; its deficiencies arise from failure to ascertain how decisions are actually taken. And to ascertain that, we need to know about processes that occur within heads."

[528] In Herbert Simon own words "within the framework of bounded rationality, we assume that people have some goals and constraints and search for an alternative that reaches the goals, subject to the constraints and within specified limits on the

Capital structure empirical research has experienced significant problems and difficulties in modeling theoretical concepts and hypotheses (e.g, Hackethal and Schmidt 1999;[529] Williamson 1990; Titman and Wessels 1988; and Simon 1984). Different factors have been identified as potentially contributing to this situation. Among these we include *identification problems*[530] (e.g., Fama and French 1997), *measurement problems*[531] (e.g., Harris and Raviv 1990, Taggart 1985), and *model mispecification problems*[532, 533] (e.g., Thies and Klock 1992). All of them are extensively discussed in the literature.

Perhaps the most embarrassing shortcoming of the actual dominant methodological paradigm in corporate finance research is the inclusion of behavioral features in empirical models. This problem limits the possible reconciliation of theoretic modeling (and empirical testing) with the observed behavior of firms and other economic actors.[534]

According to Robert Merton's view, the *core* of finance theory is "the study of the behavior of agents in allocating and deploying their resources, both spatially and across time, in an uncertain

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knowledge and computational capacities and skills of the decision maker" (Simon 1997, 18).

[529] The authors claim that "there are substantial differences between the results obtained by the various studies which use balance sheet data, and indeed the results as a whole seem to be quite unreliable. This is due to problems of methodology."

[530] Identification problems result from "stating [hypothesized] relations in a form that casts light on the underlying mechanisms" (Simon 1997, 73). Econometrically, this problem arises in the form of either over or under specifying the model. Either by omitting relevant independent variables from model, or by including irrelevant independent variables.

[531] In the particular case of banks, as pointed out in Damodaran (1999, 280), there is an additional measurement problem, which is determined by the blurring boundaries of bank's liabilities in terms of both the operating and financing functions they perform. Furthermore, measurement problems are exacerbated by difficulties in the classification of hybrid securities as debt or equity and by the use of accounting data. Selection of proxies for financial and economic variables is another source of measurement problems.

[532] Simon (1997) claims that modeling specification is contingent of prior evidence supporting both the structure and the variables to include in the model. The issues of relationship linearity and dynamics illustrate this type of problems.

[533] It should be noted that including convertible and preferred stock in other financing categories results in models with less explanatory power (for the other classifications) and higher standard errors for parameter estimates.

[534] Jensen (1983) emphatically observes that "[i]n most economic analysis, the firm is modeled as an entrepreneur who maximizes profits in an environment in which all contracts are perfectly and costlessly enforced. In this firm there are no 'people' problems, and as a result the research based on this model has no implications for how organizations are structured or how they function internally."

environment" (Merton 1995).[535] Hence, from this inspired definition, it seems reasonable to derive the implication that the object of finance theory is the financial behavior of agents.[536]

Therefore, as we attempt to explain managerial decision-making in complex (and full of subtleties) real-world settings, we ought to admit, like Simon (1997) did, that "[…] we must seek to discover what went on in the heads of those who made the relevant decisions […]."

Survey questions can provide insights into the practice of the financing behavior of firms and the factors that affect their decision-making (Norton 1989, 327).

Field-based research designs, such as surveys administered through face-to-face interviews, are helpful in the investigation of managerial motivations and constraints that determine financial decision making. They are effective tools through which "we can test some of the results of theoretical research" (Norton 1989, 326). Thus, empirical research on corporate finance should not disregard these research designs that aim at illuminating financial behavior of firms. Studies that seek empirical validation of theoretical propositions should, advantageously, include "surveys aimed at ascertaining the views and practices of financial managers and thereby create a linkage between theory, empirical evidence, and practice" (Kamath (1997). Pruitt and Gitman,[537] among others,[538] provide a similar argument.[539]

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[535] See Fama and Miller (1972) for a similar proposition. Farrelly (1980) argues that "[s]ince perceptions are important determinants of how individuals and firms allocate resources, perceptions are worthy of study."

[536] As pointed out by Mark Blaug (1992, xxv) "[E]conomics is […] a peculiar science, set apart from, say, physics because it studies human actions and therefore invokes the reasons and motives of human agents as the 'causes of things'."

[537] Pruitt and Gitman (1991) argue "although there is no substitute for theoretical and econometric-based research investigations […] one key source of information concerning investment, financing, and dividend decisions has been virtually overlooked — corporate financial managers."

[538] Dowd (1996, 38) observes "if we do not understand why agents use the contracts forms they do, then we can only have, at most, a limited understanding of firm capital structure and financing decisions." Barton and Gordon (1987, 1988) suggest an interweaving between financial economics and theoretic behavioral considerations to generate testable explanations toward a better understanding of corporate financial behavior. And Frankfurter (1994) asserts "more important, and highly questionable, is the notion that from the analysis of massive electronic data one can infer the motivations of individuals and firms."

[539] Herbert Simon (1997) claims that "[t]here is widespread recognition that economics needs closer and more direct contact with the phenomena it seeks to explain: that

Summarizing, "[because of] the complexities of the real-world setting, actual [capital structure] decision procedures are inevitably heuristic, judgmental, imitative […]" (Miller 1977, 272). Thus, exclusive reliance on econometric-based research of data sets, which is mostly useful in establishing functional relationships, estimating magnitudes and evaluating statistical goodness of fit, may be awkward in seeking to quantify motivations, expectations, and other behavioral attitudes of individuals or groups. Therefore, many debt /equity choice research questions can be beneficially analyzed by inquiring actual decision-makers using field-based research methods in order to try to enhance our knowledge about capital structure decision-making.[540]

5.3. Survey-Based Research in Corporate Finance

The use of qualitative empirical research in attempting to explain actual firm behavior with respect to capital structure and dividend decisions, as well as current events in financial markets, is a long-established practice.

Field-based empirical investigations of corporate finance were already conducted in the 1950s and the early 1960s. Lintner (1956), and Donaldson (1961)[541] examine financial managerial decision making to understand the behavioral and motivational factors involved in dividend policy and firm financing.

Survey-based empirical research has never been the standard approach in the study of corporate finance. Nevertheless, recently, interest in it seems to be growing. At the academic level, a distinguished panel of renowned financial economists[542] convened in July 1999 for a conference focusing on "Complementary Research Methodologies: The Interplay of Theoretical, Empirical and Field-

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it must develop its methods for observing economic decision process closely, inside business firms as well as in markets."

[540] Frankfurter and McGoun (1996) argue, in relation to epistemological basis of modern finance theory, that conclusions on behavioral motivations of individuals (or groups) should not be drawn without verifying their validity through direct inquiry.

[541] Interestingly enough, both Lintner and Donaldson, based on the observation of corporate behavior, developed hypotheses, respectively, for dividend and financing corporate policies, that had a clear influential role in corporate finance theory. About Lintner's results on dividend policy Myers (1994) points out that "John Lintner's model of how firms set dividends […] dates back to 1956, and it still seems to work."

[542] Among others (in alphabetical order), Franklin Allen, Robert Bruner, Gordon Donaldson, Stuart Gilson, Paul Gompers, Steven Kaplan, Robert Merton, Rick Ruback, Eduardo Schwartz, Bill Schwert, René Stulz, Peter Tufano, and Karen Wruck.

Based Research in Finance."[543] Promoters of the event declared to be interested in bringing together both "traditional" and field-based types of research in finance, as they acknowledged that "carefully studying the activities of a few firms may be one of the only ways to study phenomena which are not easily quantifiable."[544]

Likewise, a growing number of academics have employed field-based methods in their investigations of firm financial behavior.[545] Lintner (1956)[546], Baker *et al.* (1985), and Baker and Powell (1999) produced survey-based empirical examinations of the determinants of dividend policy of samples of U.S. firms. Partington (1985, 1989) used the same method when he examined the largest firms listed on the Sydney Stock Exchange Industrial List.

Survey-based research in banking has been also somewhat overlooked. One of the few examples is Scroggins, Fielding and Clark 1995, who surveyed 1000 U.S. commercial banks' directors/officers to study their perceptions and reaction to liability exposure. At the practitioners' level, in the U.S., surveys have been conducted to overcome the paucity of data, for example, in small business finance, and banking.[547]

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[543] Underlying the conference was the explicit recognition "that there are many complementary means of conducting research [in finance]."

[544] Paralleling this view, Foddy (1993) suggests that "asking questions is widely accepted as a cost-efficient (and sometimes the only) way, of gathering information about past behaviour and experiences, private actions and motives and attitudes (i.e. subjective variables that cannot be measured directly)."

[545] See, e.g., Graham and Harvey (2001), Babu and Jain (1998), Jong and Dijk (1998), Kamath (1997) and Kester et al. (1997), Trahan and Gitman (1995), Kester, Chang and Tsui (1994), Jog and Srivastava (1994), Hittle, Haddad and Gitman (1992), Pruitt and Gitman (1991), Norton (1991a, 1991b, 1989), Pinegar and Wilbricht (1989). Table appended to chapter 2 as Appendix 2.1 summarizes this literature.

[546] The model derived from Lintner's research — based upon interviews with executives of North American corporations in the mid 1950s — has been empirically tested, and confirmed by, among others, by Fama and Babiak (1968) in US. In Germany, Harhoff and Körting (1998) used an interview-designed survey to collect financing pattern information, perceived as "very scarce," from a sample of German small and medium-sized enterprises.

[547] The National Survey of Small Business Finances, the National Federation of Independent Business Survey, the Survey of Consumer Finances, and the Survey of Terms of Bank Lending are some examples surveys conducted in the U.S. at the practitioners' level. The Board of Governors of the Federal Reserve System conducted in May 1998 the 'Senior Financial Officer Survey' to assess the "impact of low required reserve balances on bank reserve management practices, recent changes in banks' behavior in the federal funds market, and changes in banks' attitudes toward the discount window." Although the decision and the responsibility to conduct such surveys belong to professional organizations, scholars have used data sets in academic studies (see, e.g., Ang, Cole and Lin 2000, Berger and Udell 1998 and Rajan and Petersen 1994).

Although the appropriate use of survey-based research may yield potentially interesting contributions to our better understanding of financing decision-making at the firm level, we must be also aware that, like any other research method, survey-based research is not problem-free. Thus, specific research must be designed and implemented aiming at circumventing some of the well-known problems that might bias responses and thereby potentially damage the scientific validity of the findings.

As we can conclude from the review of survey-based capital structure literature (see Appendix 2.1 to chapter 2 and Appendix 5.4 to this chapter), mail-administered surveys is the prevalent design in survey-based research.[548] Mail surveys, nonetheless their time and cost advantages, are exposed to non-response bias and response bias.[549] The first, related to the likelihood of having a low rate of response.[550] The second, related to the possibility of having someone answering the questionnaire that is not aware of the problem under inquiry, or is not an active part in its decision-making process.[551] A particular form of response bias may assume the form of making the surveyed organization look good for the researcher (e.g., Klammer and Walker 1987).[552] Another additional problem relates to the bias that may arise from survey participants interpreting the survey instrument questions differently in both mail-administered and interview-based surveys.

5.4. RESEARCH DESIGN

Two central problems in survey-based research are the design of the experiment, including its mode of administration, and the implementation process. The most common modes of administering a survey are the self-administration by the respondent and the personal interview (e.g., Sheatsley 1983).[553] The selection of the mode of administration is

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[548] Alternative methods of conducting survey include interviews, supported or not in a questionnaire, which can be either structure or unstructured.

[549] Tests suggested by Hsiao and Sun (1999), Wallace and Mellor (1988) and Moore and Reichert (1983) are helpful in detecting and adjusting for survey response and non-response bias.

[550] We estimated a weighted average response rate of 20.3 percent for mail-administered survey studies included in Appendix 5.4.

[551] In mail-administered surveys, questionnaires can be completed by lower (than desired) level employees within responding organizations who often have limited knowledge about the subject under inquiry [Aggarwal (1980) Interfaces 31-34].

[552] One illustration of this problem is the so-called social desirability bias (Foddy 1993). Often, this anomaly stems from inappropriate question writing.

[553] The interview may be conducted by the researcher or by professional interviewers. Additionally, the interview may be face-to-face or over the phone. Surveys administered by the respondent may be conducted either via mail or Internet.

also strongly influenced by (1) the specificity and technicality of the research topic; (2) the size, geographical dispersion and demographic characteristics of the population to be surveyed; (3) respondents' personality and sociability and level of awareness of the subject; (4) budgetary and time constraints; and (5) degree of access to the population.[554]

The most important considerations that influenced the design of our survey were the inferential nature of the study, minimization of both non-response and response biases, the intrinsic technicality of the topic, and respondents' required level of understanding of the questions (e.g., Sheatsley 1983). This last aspect proved to be decisive in our choice once recent research methodology literature suggests that the validity of the results is substantially increased in a face-to-face interview because the interviewer as the ability to "clarify the meanings of questions and response choices" (see, e.g., Schober and Conrad 1997). Personal interaction with respondents contributes to provide a consistent and accurate elucidation of the purpose of the questions and the meaning of response categories.

The survey was designed as a face-to-face interview conducted by ourselves and supported by a structured questionnaire including questionnaire with one open-end question and 55 closed questions[555] (See Appendices 6.2 and 6.3).[556]

The questionnaire structure was developed aiming at gathering data on: (1) *descriptive questions*: relevant contextual aspects of banks capital structure choice (e.g., questions 1, and 1.2);[557] (2) *conceptual / theoretical questions*: hypotheses formulated upon the theoretical discussion conducted on chapters 2 and 3 (e.g., questions 3, 9.1, 9.2, 9.3, 9.4, 9.5, 9.6, 16, 19, 21, 27, and 31); and (3) *control questions*: variables aiming at

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[554] This applies either if we are testing research hypotheses, or just seeking descriptive data about some particular event.

[555] According to Krosnick (1999), including in questionnaires closed-ended questions with a wide scope of answer choices is helpful in reducing or avoiding some of the negative influence of the so-called social desirability bias.

[556] Interviews were conducted using the Portuguese version of the questionnaire. Since results are reported in English this version of the questionnaire, translated before the beginning of the fieldwork, is also included.

[557] These questions were designed mainly to contextualize certain aspects of banks' capital structure behavior in terms of (1) the metrics predominantly used to gauge financial leverage and (2) the perceived concept of debt financing instrument. This last aspect is a recurrent source of problems in capital structure empirical research, mostly because of the difficulty in unambiguously defining the perimeter of debt financing.

providing opportunities to test congruency between responses to some survey questions (e.g., questions 2, 4 and 5).[558]

In the field implementation of our survey we followed the set of administration procedures suggested by Dillman (1983) under the designation of Total Design Method (TDM).[559] The choices of both the research design and the procedures for its implementation were made aiming at avoiding (or reducing) the methodological problems that could damage the significance of the results of the experiment.

In developing the survey instrument a primary attention was directed to establishing the validity of the construct, which, typically, is evaluated in respect to four different aspects.[560] The *content validity*, involving the verification, at the theoretical level, whether or not the questionnaire's design and structure comprehensively and specifically covers the construct. I.e., if questionnaire's conceptual foundations are adequately rooted in the theoretical discussion of the relevant literature. The *criteria-related validity* questions the degree the questionnaire fulfills the conditions determined by the structure of hypotheses (construct). The *converging validity*, in what degree the questionnaire captures measures congruent with other survey efforts focusing on similar objects of inquiry. The *discriminant validity* looks the degree to which the questionnaire measures only what it attempts to, if it has the ability to discriminate the reality from their observed effects.[561]

A number of different issues concerning the questions of the survey instrument deserve particular attention. Among them are, the type of questions to ask, their sequence, the degree of detail sought, the length of the interview, and the wording of actual questions (e.g., Patton 1990). In order to write the questions for the survey instrument we started by

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[558] Nominal and ordinal measurement scales are the most predominantly used in gathering the survey data. Whenever deemed appropriate we also asked multi-response questions. Both aspects carry non-trivial implications for the statistical treatment of survey data.

[559] TDM encompasses guidelines for the implementation of two crucial processes of the survey design: the development of the questionnaire and the administration of the survey. For a complete description of TDM procedures see Dillman (1978).

[560] Zikmund (1994, 291) defines construct validity as "the ability of a measure to confirm a network of related hypotheses generated from a theory." In survey-based research the questionnaire is viewed as a construct in the sense that, as "[…] a theoretical idea developed to explain and to organize some aspects of existing knowledge […]" (American Psychological Association 1974, 29). In this sense, the object of the inquiry is tentatively represented as a structure of interconnected hypotheses in "a dimension understood or inferred from its network of interrelationships" (ibid. 29).

[561] See Babbie (1995, 127-128)

reviewing attentively survey-based studies on capital structure. We found out that this empirical literature does not, typically, make publicly available the questionnaires used in fieldwork.[562] Moreover, we were unsuccessful in finding any questionnaire developed to study the same, or a similar, topic in banking. Thus, we developed a preliminary version of the questionnaire which we pretested in order to identify the questions that respondents might have difficulty in understanding or might interpret differently from intended (Krosnick 1999; Zikmund 1994), and to calibrate the survey instrument accordingly.

In developing the questionnaire we assumed that an interview must be limited to two hours. Hence, we were forced to trade-off the large array of questions that potentially could be included in the questionnaire and those that could yield more insight given the time constraint. Thus, important aspects related to, for example, financial contracting, security design and maturity choice,[563] were only surfaced, since each of them could probably deserve of a survey of their own. Moreover, to keep down the length of the survey, many questions had to be withdrawn, rewritten, or consolidated with other questions. The final product was a twenty five page questionnaire of fifty five questions which we append in both its Portuguese and English versions (see Annex 1 and Annex 2). In all the questions it seemed appropriate a six points Likert scale was used in order to force respondents to discriminate, either positively or negatively, their answers and consequently minimizing the tendency for mean answering behavior, typically associated with odd Likert scales.[564] To avoid response-inducing due to the arbitrary ordering of response categories, we adopted the procedure of arranging response items in the Portuguese version questionnaire (the one used in the interviews) by alphabetic order.[565]

A first pretest of the questionnaire was conducted in September 1998 using its English version. Three more pretests were conducted during November 1998 but using the Portuguese version of the questionnaire. All four runs of the pretesting were conducted in a

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[562] To the best of our knowledge Graham and Harvey (2000), Norton (1991, 1989), and Pinegar and Wilbricht (1989) are exceptions to the rule. Their papers include questionnaires specifically designed for mail-administered surveys of non-financial firms.

[563] These are some of the aspects referred by Stewart Myers at the "Vanderbuilt University Roundtable on the Capital Structure Puzzle" under the designation of *financing structure* by opposition to *financial structure*.

[564] In designing the questions that require respondents to score using a scale we adopted the following semantic descriptors: 'Strongly Disagree', 'Disagree', 'Somewhat Disagree', 'Somewhat Agree', 'Agree', and 'Strongly Agree' (Bruner and Hensel 1992, 435).

face-to-face interview format to bank executives holding senior positions in their bank's organizational structures, but none at CEO level.

5.5. SAMPLE DEFINITION

Given the strategic impact of capital structure choice, we assumed that banks' CEOs were pivotal in the decision-making in this area. Thus, we chose the CEO/bank as the unit of analysis in our study. The main criterion for inclusion in the sample was being, or had been, a CEO of a Portuguese bank during the period 1989-1998 with tenure of at least more than one full year.

The following criteria were adopted in defining the composition of the target population of our examination. First, we excluded the CEOs of all foreign banks,[566] since we were very skeptical about the possibility of having the opportunity to conduct personal interviews to the CEOs of those international banks. Second, CEOs whose tenure was less than an arbitrarily set limit of two years were not included in the target population, because we view the horizon of capital structure planning going beyond that time limit. Third, we adopted the view that CEOs of banks that at 1998 year-end were incorporated for less than two years were also not electable as members of the population. Here the rationale is related to the fact that authorities require incorporating banks to hold a minimum amount of capital. We assumed that such amount of capital was likely to be adequate for the first two years and therefore no capital structure decisions were likely to be taken during that period of time. Four, CEOs of mutual banks were not included because of the dissimilarities between the objective function of these financial intermediaries when compared to banks organized as open-investment corporations.[567] Additionally, in the Portuguese banking system there is only one 'true' mutual bank.[568]

For the purpose of identifying the population we performed a documental analysis of the composition of banks' management teams which was available through their annual

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[565] The English translation of the questionnaire (used for reporting the survey results) keeps the same alphabetic order of the Portuguese version.

[566] I.e., banks whose controlling shareholders are non-residents and therefore their capital structure decisions, most likely, are taken at international level.

[567] Contrasting with other countries in Portugal the number of banks organized under a mutual form is, clearly residual.

[568] "Caixas de Crédito Agrícola Mútuo" conduct a mutual-banking business but al the local level and with a scale and scope that hinders their inclusion in the target population.

reports.[569] With this information we developed a database of bank's Board of Directors or body of governance performing similar functions and having the same accountability profile. Based on that data we built the listing of bank's CEOs.[570] Overall the target population is composed of 57 CEOs. Our sample includes 51 CEO / bank. Six CEOs were unavailable or unwilling to participate in the survey. As expected, the 89.5 percent response rate obtained in our survey is substantially higher than the 20.3 percent average response rate observed in the capital structure mail-surveys included in Appendix 5.4.

5.6. EMPIRICAL EVIDENCE

The epistemological nature of the research objectives of this investigation is certainly one of the most relevant determinants of statistical methodological choice to conduct survey data testing. As previously declared, the main purpose of this empirical study is to gather evidence to confirm / infirm several capital structure testable propositions as we viewed them adapted to the idiosyncrasies of the banking firm. Since the inferential nature of the investigation does not call for the utilization of specialized statistical techniques, we assumed the congruence with the purpose of the investigation as the main criteria in choosing statistical methods to treat survey data.[571]

Survey questionnaires predominantly use nominal and ordinal non-metric measurement scales to gather information from respondents.[572, 573] These two types of measurement scales, however, do not show constant units of measurement; consequently, the invariability in the distance between any two adjacent points of such scales it is not warranted.[574] This innate operating characteristic of both nominal and ordinal scales,

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[569] At the early stages of this research project we mailed all banks operating in Portugal requesting copies of their annual reports since 1985 until 1996. Until now the database has been kept updated.

[570] A list with the composition of the population during the period 1989-1998 is annexed as Appendix 4.3 to chapter 4.

[571] Survey data may be thought either as a disclosure of respondents' intentioned behavior (or preferences), or to enlighten some of their individual characteristics. However, as pointed out by DeVellis (1991, 8) in either of these two circumstances "the relevance or irrelevance of the measure to theory is a matter of the investigator's intent, not the procedures used."

[572] Stevens (1946) is usually credited for having firstly suggested the following measurement scale typology: nominal, ordinal, interval and ratio.

[573] According to (DeVellis 1991, 7) "Measuring elusive, intangible phenomena derived from multiple, evolving theories poses a clear challenge to social science researchers. Therefore, it is specially important to be mindful of measurement procedures and to recognize fully their strengths and shortcomings".

[574] Such property, as it is widely known, only holds for interval and ratio measurement scales. Basilevsky (1994, 501) argues, "ordinal or rank-ordered random variables do not possess the property of distance between their particular values. Since ordinal scales are

clearly, limits the scope of statistical methods one can employ to treat data.[575] Besides measurement scales, the distributional properties of data is another critical factor when applying either univariate or multivariate statistical techniques.[576]

The structure of our survey questionnaire includes non-metric measurement scales: nominal and ordinal.[577] Consequently, it cannot be guaranteed the invariability of the distance between any two adjacent points in these measurement scales. Additional statistical computational limitations are associated with our survey design. Among them, the inclusion of multi-item response questions (questions 1.2, 18 and 21), and the number of observations (51) which sometimes do not comply with requirements of particular statistical tests (e.g., questions 10, 12 and 18).

Although multivariate statistical procedures were natural candidates for analyzing survey data, for reasons we assume well established in the literature, classical statistical multivariate methods would not fit the purposes of the statistical treatment of our survey data. Principal components analysis (PCA) and other factorial models, for instance, are essentially exploratory techniques, and thus inappropriate for conducting an inferential type of research.[578] Factorial confirmatory analysis and structural equation models both require the strict compliance with distributional properties and measurement scales that are

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only intended to reflect monotonically increasing (decreasing) sequences of magnitudes they, together with nominal variables, are at times referred to as 'qualitative' or 'nonmetric'."

[575] Dillon and Golstein (1984, 3), for example, suggest that: (1) nominal measurement scales allow the computations of the following statistics: number of cases, mode, contingency correlations (chi-square, Fisher's exact test); and (2) ordinal measurement scales allow the computations of the following statistics: median, percentiles, rank-order correlation, sign test, run test.

[576] Hair *et* al. (1998) point out that "measurement scale is critical in determining which multivariate techniques are the most applicable to the data." In the same direction Dillon and Goldstein (1984, 2) argue, "Measurement results in various types of scales, and the statistical properties of many the multivariate techniques […] rest on the explicit assumptions concerning the level of measurement."

[577] Some ordinal measurement scales were designed using a graphic format to suggest respondents the equidistance between contiguous scale response positions. Under this condition, one could presume that an ordinal scale might be a reasonable approximation of an interval scale. Questions 4.1, 4.2, 9.2, 9.3, and 12 provide illustrations.

[578] Standard principal components analysis does not impose the specification of any data distributional properties it nevertheless requires data to comply with interval measurement scales. The use of PCA for inferential purposes requires the presence of both interval measurement scale data, and multivariate normal distributional properties. According to Jolliffe (1986) "the major assumption that x has a multivariate normal distribution, is often not satisfied" See, e.g., Jolliffe (1986) for an assessment of the limitations of PCA as an inferential tool.

not present in our survey data. Using latent variable models, according, e.g,, to Lynn and McCulloch (2000) was also limited by the size of our sample.

The review of survey-based capital structure empirical literature indicates that this understanding seems to be shared by a number of other authors since in 17 survey-based capital structure papers,[579] we were unable to find but one conducting a multivariate statistical test to survey data.[580] This is also the case of the two most cited papers in this literature: Graham and Harvey (2001), and Pinegar and Wilbricht (1989).[581] We interpret this paucity in conducting multivariate statistical tests to survey data as a result of the limitations imposed by the referred above and identified in the literature.

Another question related to the statistical treatment of survey data is whether or not we should conduct a global statistical treatment of data. Different facts should be taken in consideration when analyzing this issue. Among them: (1) the fact that survey instrument includes questions of different nature: descriptive, conceptual / theoretical, and control; (2) the potential non-compliance with distributional properties of statistical models; (3) the fact that propositions included in survey questions were developed under substantially different sets of assumptions and yield a diversity predictions;[582] and (4) the recognition that previous empirical research has found quite a challenge disentangling and isolating the effects of those different capital structure hypotheses.[583, 584] Focusing on these items, and remaining unclear how putting *all* survey data to simultaneous statistical testing could yield a substantive contribution to enhance the relevance of the results, it was considered inappropriate to submit data to a global statistical test.

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[579] See Appendix 2.1 to chapter 2.
[580] Norton (1991) uses factor analysis to study this problem. His results, however, contradict with his own previous work using the very same survey data.
[581] According to the Journal of Financial Economics' website, Graham and Harvey (2001) ranked number one on the top ten more requested papers during the January-December 2001 period.
[582] Survey questions inquired about a number of different propositions which the literature typically clusters around a number of theoretical determinants of firm capital structure choice. For example, under the taxation determinant we queried survey participants about tax hypotheses such as (1) the tax advantage of borrowing costs (Modigliani and Miller 1963); (2) the role of investors' income taxation (Miller 1977); (3) the tax advantage of non-debt tax shields (DeAngelo and Masulis 1980).
[583] Several capital structure transactions are explained by competing theories. *Signaling*, *underpricing*, *free cash flow*, *manager-equityholder* and *corporate governance* theories, are alternative models to explain a "pure" capital structure decision, such as a debt-for-equity swap.
[584] See Fama and French (1998) for an account of similar problems in quantitative data capital structure research.

Overall, the statistical treatment of survey data was planned and executed aiming at: (1) fulfilling the inferential purpose of the investigation; (2) focusing on the precedence of efficacy over complexity in statistical technique selection; (3) complying with the intrinsic nature of the data in terms of their distributional properties and measurement scales and their associated problems; and (4) emulating previous empirical work in the area. Appendix 5.1 includes a summary of the statistical testing conducted on survey data.

The disclosure of descriptive statistics related to our sample is somewhat constrained by the guarantees of confidentiality given to survey participants. In order to provide some descriptive characteristics of surveyed CEOs without compromising those guarantees, we appended to this chapter (see Appendix 5.5) three tables including: (1) survey summary descriptive statistics; (2) distribution of CEOs' tenure; and (3) CEO/bank's capital ratio.

Survey Results

Metrics of Bank Financial Leverage. Question 1.1 queries survey participants about their preferred measures for gauging a bank's level of financial leverage.[585] As suggested in both the academic and practitioner banking literatures, capital ratio — defined as the relation between equity capital and net total assets — is typically perceived among the banking community as the most 'popular' measure of financial leverage. Thus, we expect capital ratio (irrespective of its valuation framework) to be a popular pick among the CEOs included in our sample. Given its conceptual similarity to the regulatory solvency ratio, if the survey results confirm this preference, then we would interpret it as an indication of a primary concern with regulatory discipline. Further, the selection of a leverage metric in which, at least one type of security, is valued at its market price might be interpreted as revealing concern with other forms of external discipline, such as the one provided by capital markets. Therefore we hypothesize that market valued financial leverage ratios should be a preferred measure of CEOs of listed banks. Table 5.1.1 presents the survey findings.[586]

[585] As mentioned earlier, an English version of the questionnaire is appended as Annex 2.
[586] Statistical tests were computed using SPSS 10.0 software.

Table 5.1.1

Preferred Measures of Financial Leverage[a]

[unit: percent]

Book value of debt / Book value of equity	11.3
Book value of debt / Market value of equity	5.6
Book value of equity / Book value of net total assets	45.1
Market value of debt / Market value of equity	5.6
Market value of equity / Book value of net total assets	9.9
Market value of equity / Market value of net total assets	5.6
Other	16.9

[a] In this question multiple response was allowed. A total of 72 responses were registered. Percentages are based upon those 72 responses. Percentages may not add up to 100 percent due to rounding.

We firstly examined the (multiple) preferences of surveyed CEOs concerning the measurement of equity financing in bank capital structures. Ignoring valuation considerations, data shows that 60.6 percent of CEOs' choices indicate a preference for the 'traditional' capital ratio yardstick, while 22.5 percent for the debt-to-equity ratio. 'Other' specified leverage metrics accounts for 16.9 percent of responses. Among the choices made under this last category, the solvency ratio (measured either under the rules of the 1988 Basle Accord or the Portuguese Central bank) was the most popular. Taking in consideration these responses makes the percentage of responses indicating CEOs preference for the capital ratio to increase to 74.6 percent.[587] These results are consistent with prior expectations, which identified the capital ratio as a 'popular' measure of bank financial leverage.[588] In terms of valuation preferences — *book value* versus *market value* — book value-based ratios accounted for 56.3 percent of responses and market value-based ratios for 26.8 percent.[589] These results are consistent with the fact that in the Portuguese banking system, during the time period under scrutiny, only a minority of the equity shares of banks were publicly traded in organized equity secondary markets, albeit the privatization program of state-owned banks occurred during that period of time.[590]

We also looked at the distribution of CEO responses on preferred measures of expressing financial leverage when sorted by form of ownership — state-owned or privately-owned. As shown in Table 5.1.1.1, the capital ratio was selected by 68.4 percent

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[587] We were able to 'reclassify', in terms of their *proximity* with either the capital ratio metric or debt-to-equity metric, the leverage measures specified under the 'Other' category.

[588] Measuring banks' financial leverage in terms of book values is a 'standard' practice in both bond rating and bank capital regulation (e.g., Marcus 1983).

[589] In our criterion a ratio is classified as valued in market terms if any of its components is *marked to market*.

[590] We consider a bank as state-owned if the State has a controlling stake regardless its size.

of the state-owned bank CEOs and by 76.9 percent of privately-owned bank CEOs. In terms of the ratio components valuation approach, 65.4 percent of the selections favored book value-based ratios and 34.6 percent favored market value-based ratios.

Table 5.1.1.1
CEOs Responses to Preferred Measures of Financial Leverage

CEOs of:	Capital Ratio	Debt-to-Equity	Book Value	Market Value
State-Owned Banks				
Number of selections	13	6	18	1
Percentage	68.4	31.6	94.7	5.3
Privately-owned Banks				
Number of selections	40	12	34	18
Percentage	76.9	23.1	65.4	34.6

CEOs' preferred metric for assessing the use of equity capital in banks' capital structure may be better pursued by focusing on the proportions of CEOs that indicated a particular measure, rather than focusing on the total number of selections made in their responses. In our view, the first approach biases the results. Because multiple answers were allowed in answering this question, this translated into more weight given to responses that indicated more than one measure, even if CEOs' selections all involved the same type of ratio or valuation.

Information in Table 5.1.1.2 summarizes the data about the CEOs who selected either capital ratio or debt-to-equity leverage measures, and the CEOs that indicated a preference for book value-based ratios or market value-based ratios. Analysis will follow.

Table 5.1.1.2
Distribution of CEOs Preferred Measures of Financial Leverage

CEOs	Capital Ratio	Debt-to-Equity	Book Value	Market Value
Number	45	6	40	11
Percentage	88.2	11.8	78.4	21.6

To test the (previously formulated) proposition that CEOs of listed banks might have a preference for market value-based ratios, we conducted a Fischer (exact) test of independence which, at the 5 percent significance level (p-value: 0.0469) provides support for our hypothesis.[591]

[591] As pointed out in the statistical literature, one of the assumptions of the chi-square test requires a minimum threshold for the expected (under the hypothesis of independence) count per cell. Sheskin 1997, 210), for example, argues that the "expected frequency of each cell in the contingency

Sources of External Financing. Question 1.2 aims at gathering and assessing information among surveyed CEOs about the most frequently used external financing instruments other than common equity capital.[592] We would expect answers to this question to follow a pattern, when we control for bank ownership and size. The conceptual foundation for this conjecture is grounded in ownership and control, and in informational considerations. Responses to Question 1.2 Results are tabulated in Table 5.1.2.

Table 5.1.2

Sources of External Financing [a]

[unit: percent]

Preferred stock	13.6
Subordinated debt	24.8
Interbank loans	15.2
Bonds	26.4
Participating bonds[593]	7.2
Other	12.8

[a] In this question multiple response was allowed. A total of 124 responses were registered. Percentages are based upon those 124 responses. Percentages may not add up to 100 percent due to rounding.

Responses reveal that the most popular instruments of external financing, excluding straight equity capital, are bonds (26.3 percent) and subordinated debt (25.0 percent). Interbank financing (excluding short-term borrowing) and preferred stock are indicated as equally important sources of banks' funding. Sources of external financing other than the ones included in the questionnaire represent 12.1 percent of responses. Among those sources were commercial paper and asset securitization transactions.

Survey participants include CEOs of both state-owned and privately-owned banks. Given the differences in crucial organizational dimensions — such as ownership structure

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table is 5 or greater." Failure to comply with this assumption implies that "the probabilities in the chi-square distribution may not provide an accurate estimate of the underlying sampling distribution" (ibid. 210). Cochran (1952) suggests a criterion, which requires a minimum expected count of 1, and that expects counts below 5 not to be greater than 20 percent. Others authors are believed to proclaim that those conditions might be too stringent. For the sake of conformity we conducted Fischer (exact) tests in any instances where testing independence was considered as appropriate. Since the this test is only available for 2 X 2 contingency tables, every time this requirement was not verified we collapsed different categories of a variable.

[592] The set of debt financing instruments besides 'pure' debt securities includes a hybrid security — preferred stock — which features characteristics of both debt and equity securities.

[593] This type of financial instrument is approximately equivalent to income bonds. It returns to bondholders a fixed interest coupon plus a variable payment indexed to bank performance. Specific contractual arrangements may vary between issues. Only nationalized banks issued this type of security and conventional wisdom seems to indicate that this was a substitute for equity, a form of financing which the government almost never provided during the period when banks were state controlled.

and control rights — preferred sources of external financing might be expected to be different (see Table 5.1.2.1).

Table 5.1.2.1
Sources of External Financing

[unit: percent]

	Choices of CEOs of:	
	State-Owned Banks[a]	Privately-Owned Banks[b]
Preferred stock	3.3	16.8
Subordinated debt	23.3	25.3
Interbank loans	13.3	15.8
Bonds	26.7	26.3
Participating bonds	20.0	3.2
Other	13.3	12.6

[a] In this question multiple response was allowed. A total of 30 responses were registered. Percentages are based upon those 30 responses. Percentages may not add up to 100 percent due to rounding.
[b] In this question multiple response was allowed. A total of 94 responses were registered. Percentages are based upon those 94 responses. Percentages may not add up to 100 percent due to rounding.

The data suggests that preferred stock and participating bonds are differently used by CEOs of state-owned banks and CEOs of privately-owned banks, whereas subordinated debt, bonds, and bank financing appears to exhibit similar patterns of use among those CEOs.

Conventional wisdom would point to firm size as another factor that might impact the choice of financing instrument.[594] To test the role of bank size (measure by deflated total net assets; see Appendix 5.3)[595] in the preference for different funding sources, we performed a set of logistic regressions. In these regressions we specified the CEOs choices of different sources of financing as (binary) dependent variables and size as the independent variable.[596] Regression results do not provide support for the existence of any relationship, at the 5 percent significance level, between bank size and external sources of financing. This apparent absence of a relationship may result from the cost advantage that Portuguese banks, in general, seem to enjoy in new financing as compared to non-bank

[594] Blackwell and Kidwell (1988) suggest that there are economies of scale in issuing public debt.
[595] We computed the 1989-1998 real time-series of banks (total) net assets using the deflator implicit in Gross Domestic Product (GDP). Data source: *OECD Economic Outlook* 66; December 1999. GDP Deflators - Annex Table 14: 208-209.
[596] The proxy for bank size was constructed averaging a bank's real total net assets during CEOs tenure.

capital issuers.[597] Answers to question 30 (see later) seem to provide some evidence consistent with this argument.

Bank Financial Management Objectives. Question 2 asks CEOs to rate, on a scale from 1 (least important) to 6 (most important), the importance assigned to each item in a list of banks' financial management objectives. Overall results are documented in Table 5.2-A.

Table 5.2-A
Banks CEOs Financial Management Objectives

	Mean Scores
Achieve and maintain high debt *ratings*	3.6
Achieve a capital structure similar to that of other banks	2.5
Enhance or sustain financial flexibility. Ensure financial independence and survival	4.3
Maximize the *market price* of bonds and stock	2.3
Maximize the market share (in terms of net total assets)	2.4
Maximize the *Price Earnings Ratio*	2.1
Maximize the *Return on Investment*	3.6
Maximize the *Return on Equity*	4.8
Maximize the growth of earnings per share	3.5
Maximize shareholders' returns	4.3
Maximize the *book value* of a share of stock	2.8
Maximize the *book value* of the bank's net total assets	2.2
Maximize the *cash flow* per share of stock	2.8
Minimize the risk of financial distress and bankruptcy	3.3
Minimize the bank's cost of capital	4.0

Standard finance textbooks point to maximization of shareholders' wealth as a central objective for corporate managers. The responses of CEOs in our sample are consistent with that principle. The average score of 4.3 is supportive of the idea that Portuguese banks' CEOs recognize maximization of shareholder return as an important goal.

The objective of maximizing banks' return on equity (as measured by net income related to total equity) received an average score of 4.8.[598] This result is not surprising and is consistent with the objective of maximizing shareholders' wealth. To test the hypothesis concerning the consonance of these two, we performed a signed rank test for the two expected values. The results show, however, that at the 5 percent level the differences in

[597] Underlying this argument is the notion that banks, at least in Portugal, appear to exhibit an expertise in originating financial assets that give them some issuing cost advantages in their trips to the financial markets.
[598] We estimate the average return on equity (ROE) of Portuguese banks included in our database at 17.0 percent (standard deviation: 6.5) during the 1989-1998 period. The average return on assets (ROA) was estimated at 0.8 percent (standard deviation: 0.2) during the 1989-1998 period.

the two sample means are not statistically significant; therefore we cannot reject the null hypothesis of equal population means.

The bank CEOs recognized the importance of enhancing and sustaining financial flexibility as well as ensuring long-term survival and financial independence (mean score: 4.3). Similar findings are reported in other survey-based investigations of the managerial perspective of capital structure choice (see Graham and Harvey 1999, Norton 1991 and Pinegar and Wilbricht 1989).

It is well known that the minimization of a bank's cost of capital is achieved when the optimal capital structure is attained. Therefore, the average score on this item (4.0) is seen as evidence in support of the hypothesis that CEOs consider achieving an optimal capital structure as an important objective.

Splitting the sample by state-owned and privately owned banks. We might conjecture that our results could be biased because CEOs of state-owned banks, according to the theory, could have different financial management objectives than CEOs of privately-owned banks. Thus, to more accurately characterize the objective functions of these two groups of managers, we split the sample in two: one for CEOs of state-owned banks and another for CEOs of privately-owned banks (see Table 5.2-B).[599]

[599] The criteria to categorize a bank as a state-owned or private-investor owned was based on the documental examination of banks' annual reports and on the financial statement database we build. A bank was considered to be state-owned, even in the event of a partly privatized bank, if the majority of ownership of residual control belongs to private investors, independent of the presence of any type of protective control device such as a 'golden share'.

Table 5.2-B
Financial Management Objectives of State-Owned and Privately-Owned Bank CEOs

	Mean Scores of CEOs of:	
	State-Owned Banks	Privately-Owned Banks
Achieve and maintain high debt *ratings*	3.6	3.6
Achieve a capital structure similar to that of other banks	2.2	2.6
Enhance or sustain financial flexibility. Ensure financial independence and survival	4.4	4.2
Maximize the *market price* of bonds and stock	1.3	2.8**
Maximize the market share (in terms of net total assets)	1.9	2.7
Maximize the *Price Earnings Ratio*	1.5	2.4*
Maximize the *Return on Investment*	3.9	3.4
Maximize the *Return on Equity*	4.5	4.9
Maximize the growth of earnings per share	2.7	3.8
Maximize shareholders' returns	3.5	4.7†
Maximize stock *book value*	2.7	2.8
Maximize the *book value* of the bank's net total assets	1.5	2.5*
Maximize *cash flow* per share	2.8	2.8
Minimize the risk of financial distress and bankruptcy	2.5	3.7*
Minimize the bank's cost of capital	3.1	4.4†

† Significant difference at the 5 percent level for one-sided tests. †† Significant difference at the 1 percent level for one-sided tests.
*Significant difference at the 5 percent level for two-sided tests. ** Significant difference at the 1 percent level for two-sided tests.

The average scores on the shareholders' wealth maximization goal are 3.5 and 4.7 for CEOs of state-owned and privately-owned banks respectively. To test the hypothesis that the CEOs of privately-owned banks are more oriented towards maximizing owners' wealth than are CEOs of state-owned banks, we performed a one-sided Wilcoxon-Mann-Witney rank sum test (of two independent samples).[600] At the 5 percent level (*p*-value: 0.0468) we found support for the hypothesis.

The mean scores for "minimizing risk of financial distress and bankruptcy" are 2.5 and 3.7 respectively, for state-owned and privately-owned banks' CEOs.[601] To test the hypothesis that CEOs of state-owned banks are less concerned with financial distress and bankruptcy than their privately-owned counterparts, we performed the same one-sided Wilcoxon-Mann-Witney rank sum test (of two independent samples), and found support for the hypothesis at the 5 percent level (p-value: 0.0234). This is not a surprising result. Given their proximity to government, CEOs of state-owned banks may take comfort from the presence of the governmental safety-net in the event of a bank crisis. Another explanatory factor could be the too big to fail hypothesis (see Tables 6.16 and 6.16.1).

[600] The statistical test assumes that the two variables have similarly shaped distributions.

Another possible factor could be the absence of both capital market and market for corporate control discipline (see Table 5.4).

Another interesting finding relates to the attitude of CEOs of state-owned and privately-owned banks with respect to minimizing their cost of capital. The average score on this item, 3.1 and 4.4 respectively, indicates that CEOs of state-owned banks perceive the issue as relatively unimportant, while CEOs of privately-owned banks are much more preoccupied with it. To test the hypothesis that CEOs of state-owned banks are less concerned with the minimization of capital cost than their privately-owned counterparts, we conducted a one-sided Wilcoxon-Mann-Witney rank sum test of two independent samples. At the 5 percent level, we obtained strong evidence in support of our hypothesis (*p*-value: 0.0257). This result is obviously consistent with the finding that that privately-owned bank CEOs are more concerned with the maximization of owners' wealth than the CEOs of state-owned banks.

CEOs included in the two subsamples showed a similar level of concern towards the enhancement and the sustainability of their banks' *financial slack*,[602] achieving and maintaining favorable bond ratings, as well as maximizing return on investment (ROA), stock book value and cash flow per share.

Splitting the sample by 'de novo' versus established banks. As documented in the banking literature (see, e.g., DeYoung and Hasan 1998) de novo banks are likely to experience a different level and pattern of performance, when compared to established banks, at least in the early years of their life cycles.[603] These arguments suggest that the objective function of CEOs of these two types of banks might differ in some material dimensions. Exhibit 5.2-C presents the survey findings.

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[601] Grossman and Hart (1982) suggested, on the grounds of managerial risk aversion, the *bankruptcy risk hypothesis*.

[602] This term was used by Myers and Majluf (1984, 188) to mean "large holdings of cash or marketable securities, or the ability to issue default-risk-free debt." We use the concept to mean financial flexibility that might ensure financial independence and long-term survival.

[603] In this analysis we categorize as 'de novo' a bank chartered after 1984, and as 'established' a bank chartered before 1984. Hunter and Srinivasan (1990) suggest that performance was most directly associated with factors within managerial control, such as lending policies, cost control effectiveness, and degree of bank capitalization. Further but was not necessarily associated with market structure or environmental conditions.

Table 5.2-C
Financial Management Objectives of 'De Novo' and 'Established' Bank CEOs

	Mean Scores of CEOs of:	
	De Novo-Banks	Established-Banks
Achieve and maintain high debt *ratings*	2.8	4.3††
Achieve a capital structure similar to that of other banks	2.0	2.8
Enhance or sustain financial flexibility. Ensure financial independence and survival	4.3	4.2
Maximize the *market price* of bonds and stock	2.3	2.3
Maximize the market share (in terms of net total assets)	2.5	2.4
Maximize the *Price Earnings Ratio*	2.2	2.1
Maximize the *Return on Investment*	3.4	3.8
Maximize the *Return on Equity*	4.5	5.0
Maximize the growth of earnings per share	3.6	3.3
Maximize shareholders' returns	4.5	4.2
Maximize stock *book value*	2.7	2.9
Maximize the *book value* of the bank's net total assets	2.2	2.2
Maximize *cash flow* per share	2.6	3.0
Minimize the risk of financial distress and bankruptcy	3.3	3.4
Minimize the bank's cost of capital	4.3	3.7

† Significant difference at the 5 percent level for one-sided tests. †† Significant difference at the 1 percent level for one-sided tests.
*Significant difference at the 5 percent level for two-sided tests. ** Significant difference at the 1 percent level for two-sided tests.

The evidence provided by our two subsamples seems consistent with the idea that profitability is a common concern to both de novo and established banks. The two cohorts of CEOs rate the objective of ROE and EPS growth rate maximization at similar levels.

Differences in mean scores of de novo and established bank CEOs on the importance of credit ratings appear to be consistent with the classical argument that there are increasing returns to scale in such bond credit quality enhancement. This would presumably be more highly valued by CEOs of established banks as suggested by the significant difference in the importance assigned to bank reputation by the two cohorts of CEOs (see Table 5.5.4). On the other hand, financial flexibility and independence seems to be a relevant and shared concern for respondents in both groups.

Table 5.2-D
Financial Management Objectives of 'Listed' and 'Unlisted' Bank CEOs

	Mean Scores of CEOs of:	
	Listed Banks	Unlisted Banks
Achieve and maintain high debt *ratings*	4.6	3.1**
Achieve a capital structure similar to that of other banks	3.0	2.1†
Enhance or sustain financial flexibility. Ensure financial independence and survival	4.6	4.1
Maximize the *market price* of bonds and stock	3.1	1.8**
Maximize the market share (in terms of net total assets)	2.9	2.2
Maximize the *Price Earnings Ratio*	2.8	1.8††
Maximize the *Return on Investment*	3.9	3.4
Maximize the *Return on Equity*	5.4	4.4†
Maximize the growth of earnings per share	4.1	3.1
Maximize shareholders' returns	4.8	4.0†
Maximize stock *book value*	2.9	2.7
Maximize the *book value* of the bank's net total assets	2.5	2.0
Maximize *cash flow* per share	3.1	2.7
Minimize the risk of financial distress and bankruptcy	3.9	2.9
Minimize the bank's cost of capital	3.8	4.1

† Significant difference at the 5 percent level for one-sided tests. †† Significant difference at the 1 percent level for one-sided tests.
*Significant difference at the 5 percent level for two-sided tests. ** Significant difference at the 1 percent level for two-sided tests.

Splitting the sample by listed versus unlisted banks. The highest ranked objectives by CEOs of listed banks are the maximization of return on equity and maximizing shareholders wealth. For listed banks these scores are 5.4 and 4.4, respectively. Achieving and sustaining financial flexibility and achieving high bond credit ratings follow next in importance for CEOs of listed banks. CEOs of unlisted banks seem slightly more concerned with the cost of capital minimization than do their counterparts at listed banks. This result is inconsistent with the responses to question 13. There, CEOs of listed and unlisted banks showed similar levels of interest in bank costs of capital when compared to the industry average, mean scores of 3.4 and 3.3 for listed and unlisted banks respectively. A satisfactory explanation for this result was not found, although the evidence on both items failed to show statistical significance.

Under the *capital market discipline hypothesis* we would expect CEOs of listed banks to be more concerned with minimizing of the risk of financial distress and bankruptcy than their unlisted counterparts. To test this hypothesis we conducted a one-sided Wilcoxon-Mann-Witney rank sum test of the two independent samples. We obtained a *p*-value of about 4.2 percent (0.04199), which provides support for the hypothesis at the 5 percent level of statistical significance.

Splitting the sample by over-capitalized versus under-capitalized banks. As previously discussed (see Appendix 2.1 to chapter 2), a number of authors suggested that

an industry average leverage ratio can be rationalized as an appropriate proxy for a target capital structure. Thus, we hypothesize that the objectives of capital structure decision-making by CEOs of banks with different leverage condition might as well be distinct. To test this proposition we used data from our banks' financial statement database to compute banks average capital ratio during the tenure of each CEO included in our sample (see Appendix 5.3).[604] We also calculated the average capital ratio for the sample of banks included in our database during the same time period, using it as a proxy for the target capital structure (see Appendix 5.3).[605] Subsequently, we constructed binary variable classifying as 'over capitalized' the banks whose average capital ratio during the CEO tenure was higher than the industry's average capital ratio during the same time period. We classified as 'under capitalized' those banks whose average capital ratio during the CEO tenure was lower than the industry's average capital ratio.[606] This partitioning of the sample allowed us to use simultaneously qualitative data gathered in our survey and quantitative data from banks financial statements. Table 5.2-E presents the results.

Table 5.2-E
Financial Management Objectives of 'Over' and 'Under Capitalized' Bank CEOs

	Mean Scores of CEOs of:	
	Over-Capitalized Banks	Under-Capitalized Banks
Achieve and maintain high debt *ratings*	3.1	4.2†
Achieve a capital structure similar to that of other banks	2.1	2.9†
Enhance or sustain financial flexibility. Ensure financial independence and survival	4.0	4.6
Maximize the *market price* of bonds and stock	2.1	2.5
Maximize the market share (in terms of net total assets)	2.2	2.7
Maximize the *Price Earnings Ratio*	1.9	2.5
Maximize the *Return on Investment*	3.2	4.1†
Maximize the *Return on Equity*	4.5	5.1
Maximize the growth of earnings per share	3.0	4.0
Maximize shareholders' returns	4.1	4.6
Maximize stock *book value*	2.2	3.5††
Maximize the *book value* of the bank's net total assets	1.8	2.7†
Maximize *cash flow* per share	2.3	3.5*
Minimize the risk of financial distress and bankruptcy	3.0	3.7
Minimize the bank's cost of capital	3.7	4.3

† Significant difference at the 5 percent level for one-sided tests. †† Significant difference at the 1 percent level for one-sided tests.
*Significant difference at the 5 percent level for two-sided tests. ** Significant difference at the 1 percent level for two-sided tests.

[604] We computed weighted (by deflated net total assets) average of capital ratios.
[605] The industry average capital ratio calculation was weighted by the deflated value of net total assets.

Evidence shows that the significant differences in financial management objectives of 'over' and 'under capitalized' bank CEOs relate to debt ratings, capital structure benchmarking and the maximization of return on investment, stock book value, book value of assets and cash flow per share. In all these categories mean scores of CEOs of 'under capitalized' banks are higher that those of their 'over capitalized' counterparts. Results are interpreted as consistent with the hypothesis that CEOs of under capitalized banks should be more concerned with the disciplinary role of debt. Consequently, we expected that group of CEOs as being influenced by variables that relate to capital structure valuation, such as credit ratings and comparisons to industry average capital ratio.

Capital Structure Policy Models. Banks' capital structure policies can follow several alternative models. In question 3 we queried CEOs about their preferred models of defining capital structure policy, and attempted to uncover a valid description of capital structure policy design for CEOs of Portuguese banks. Miller's (1977) 'neutral mutation' hypothesis suggests that firms may develop financing habits that tend to "follow the lines of least resistance as well as least damage" (Kamath 1997, 335-6). Fisher, Heinkel and Zechner (1989) suggest that the nature of corporate capital structure decisions is dynamic rather than static. They point to wide variations in observed financing behavior, which might be related to factors such as the current position in the firm's life cycle (e.g., Fluck 1999b), and the firm's governance structure (e.g., Berger, Ofek, and Yermack 1997). CEOs who indicated a preference for defining and maintaining a target capital structure were further asked how that target was devised. Alternatives included the adoption of the industry's average capital ratio, the use of a cost-benefit analysis of alternative long-term financing strategies, and benchmarking the capital structures of competitors.[607] These alternatives sort themselves into two capital structure approaches — pro-active and reactive, respectively — and may be viewed as competing hypotheses worth testing. The results are presented in Table 5.3.1.

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[606] To implement this procedure we have to use qualitative data gathered in our survey and quantitative data from our banks' financial statements database.

[607] Industry average leverage ratios were suggested as surrogates for firms' target capital structure by Bowen, Daley and Huber (1982), among others.

Table 5.3.1
Prevailing Intention in the Bank's Strategic Financing Decision-Making

	[unit: percent]
Follow a previously defined set of guidelines on financing policy	31.4
Achieve and adhere to a definite target for capital structure	5.9
Reach an optimal capital structure by comparison of, both, economic costs and benefits	39.2
Keep to the financing pattern historically followed by the bank	2.0
Follow a pre-determined hierarchy in exhausting the available strategic financing sources	21.6

We obtained usable answers to this question from all the CEOs. Overall, 39.2 percent of the CEOs indicated their preference for a proactive *optimal capital structure* policy. Implementing a previously defined set of guidelines on financing policy was the choice of 31.4 percent of the CEOs, whereas, the previously discussed "pecking order" of financing was chosen by 21.6 percent of the sampled CEOs. The evidence gathered from respondents show that pursuing a reactive industry or competitor *target capital structure* is not a favored policy. Likewise, Miller's (1977) *neutral mutations* (i.e., keep the historical pattern of financing) hypothesis was indicated by only a miniscule 2 percent of the respondents and therefore was disregarded. The evidence suggests that those CEOs who follow an optimal capital structure policy seem to prefer a *pro-active* approach rather than a passive one.

CEOs who selected the "achieve and adhere to a definite target for capital structure" option on question 3 were subsequently asked to indicate how their banks' capital structure policies had been defined and the sources of eventual departures from it. As pointed out earlier, only 5.9 percent of the respondents (i.e., three CEOs) chose this model of capital structure policy. Two of those CEOs selected the option "by means of a cost/benefit analysis of alternative financing strategies" to answer question 3.1, and "change in the bank's growth opportunities portfolio" and "a change in [the bank´s] return on equity" in responding to question 3.1.1. The other CEO picked "by adopting the average financial leverage ratio of the industry" and "change in [the bank's] return on equity" to answer the same questions.

CEOs that choose "follow[ing] a pre-determined hierarchy in exhausting the available financing sources" in question 3 were subsequently asked to spell out that hierarchy. Only eleven CEOs did so, and the results (see Table 5.3.2) are contradictory to our expectations.

Table 5.3.2
Priority in Exhausting Financing Sources

	[unit: percent]
Common stock	5.8
Preferred stock	4.3
Convertible preferred stock	4.1
Convertible debt	1.3
Subordinated debt	5.3
Straight bonds	3.1
Retained earnings	4.7
Participating bonds	1.0

Using the pecking order theory we would expect retained earnings to be the first financing source to be used, followed by the different types of debt instruments. Equity capital would be used only as a last resort. The survey results, however, suggest that common stock is most favored. Several factors could explain this apparent anomaly. We believe that the differences in the informational setting and the governance structure of the Portuguese banks run by the surveyed CEOs and the set of assumptions underlying the theory are helpful in understanding these results.[608]

The sixteen CEOs that in question 3 chose to "follow a previously defined set of guidelines on financing policy" were subsequently asked to identify the origin of the guidelines that framed their bank's capital structure policies (see Table 5.3.3).

Table 5.3.3
Origin of the Guidelines on Financing Policy

	[unit: percent]
Proposal from the bank's financial management	6.3
Decision of the shareholders general meeting (or equivalent)	43.8
Board of directors' deliberation (or similar)	43.8
Other	6.3

The results show that the "decision of the shareholders general meeting (or equivalent)" and "board of directors' deliberation (or similar)" were the most (and equally) important sources of capital structure policy definition. This picture changed significantly when we looked at the responses of state-owned and privately-owned bank CEOs. In these instances, 55.6 percent of CEOs of state-owned banks indicated that the decision of the shareholders general meeting was the main source of capital structure guidance. Board of

[608] An illustration of our argument is provided by the acknowledgement that, in a sample of 20 equity public offerings of Portuguese banks during the 1995-1998 period, we systematically find a *rights offer* component

director deliberation was mentioned in 33.3 percent of the responses. Corresponding percentages for the CEOs of privately-owned banks were 28.6 percent and 57.1 percent, respectively. State-owned banks could be expected to take their orders from meetings with their shareholders, while privately-owned banks would be more likely to formulate capital structure policies in board meetings.

We can conjecture that preferences towards different models of capital structure policy may reflect differences in bank ownership; therefore we hypothesize that the responses of CEOs of state-owned and privately-owned banks might differentiate themselves in this respect.

Table 5.3.4
Prevailing Intention in Banks' Strategic Financing Decision-Making
CEOs of 'State-Owned' and 'Privately-Owned' Banks

[unit: percent]

	CEOs of:	
	State-Owned Banks	Privately-Owned Banks
Follow a previously defined set of guidelines on financing policy	60.0	19.4**
Achieve and adhere to a definite target for capital structure	13.3	2.8
Reach an optimal capital structure by comparison of, both, economic costs and benefits	13.3	50.0*
Keep to the financing pattern historically followed by the bank	0.0	2.8
Follow a pre-determined hierarchy in exhausting the available strategic financing sources	13.3	25.0

† Significant difference at the 5 percent level for one-sided tests. †† Significant difference at the 1 percent level for one-sided tests.
*Significant difference at the 5 percent level for two-sided tests. ** Significant difference at the 1 percent level for two-sided tests.

We interpret this result as a consequence of having in our sample CEOs of state owned banks who are likely to be more concerned with institutional discipline than would be true of the CEOs of privately-owned banks and listed-banks. This latter group of CEOs is more likely to be subject to the disciplinary role of financial markets, as emphasized in the agency literature. Thus, it could be conjectured that capital structure decision-making within the privately-owned, publicly-traded banks is better aligned with the interests of their residual claimholders.

External Determinants on Bank Capital Structure Decisions. Both internal and external factors are, arguably, influential in capital structure decision-making. Question 4 asked CEOs to appraise the influence of such factors on a scale from 1 (least important) to 6 (most important) as they impact on capital structure decisions. Categories included in

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or other feature (such as, conversion of convertible bonds) providing a similar effect in curtailing the

these two questions represent concepts and hypothesis that are frequently submitted to empirical testing in the capital structure literature (as discussed in Chapter 2). Moreover, the evidence amassed in some of those categories provides data for testing associations with other responses obtained from survey questions. Results are presented in Tables 5.4-A, 5.4-B, 5.4-C, and 5.5-D.

Table 5.4-A
Influence of External Factors on the Bank Capital Structure Decisions

	Mean Scores
Possibility of a takeover bid	1.8
Change in the ratio of public deficit to gross domestic product	1.5
Changes in the regulation and supervision framework	4.3
Private consumption behavior	1.6
Currency market behavior	1.5
Capital market performance	3.3
World economy performance	1.8
National economy performance	2.9
Political instability	2.3
Change in the dynamics of credit demand	3.1
Change in firms' and investors' income taxation	2.8
Legal restrictions on share repurchases	1.8
Interest rate changes	2.6

The results, overall, show that changes in a bank's regulatory and supervisory framework are a relevant factor in capital structure decision-making (mean score: 4.2). Capital market performance is seen by CEOs as less important (mean score: 3.3) in such decisions. Responses on the importance of changes in the dynamic of loan demand as they relate to capital structure choice were, on average, rated at 3.0, a weak influence on banks' capital structure decisions. Interestingly, takeover threats are not perceived as a meaningful corporate control disciplinary device (average score: 1.8). Both results are in line with academic literature, which maintains that regulatory intervention in the banking industry may be an effective (if imperfect) substitute for the discipline of both the capital market and the market of lending and deposits.[609] Additionally, regulatory restrictions on takeover activity in banking may account for the CEOs lack of concern about takeover threats (e.g., Prowse 1997). This conclusion is also reaffirmed when the sample is divided into CEOs of state-owned banks and CEOs of privately-owned banks (see Table 5.4.2).

potential adverse selection effects of the issue.
[609] See chapter 3 for further discussion.

Another interesting piece of evidence relates to CEOs views on share repurchases restrictions. These are clearly viewed as unimportant, despite the conventional wisdom and recent anecdotal evidence on such capital structure activity in the Portuguese banking market.[610] Changes in macroeconomic and institutional environmental factors included in question 4, such as the ratio of public deficit to gross domestic product, private consumption behavior, economic performance (domestically and internationally), and changes in tax laws (at the bank and investor level), are seen as largely irrelevant to bank' capital structure decisions. The same applies to the remaining enumerated external factors.

Table 5.4-B

Influence of External Factors on the Bank Capital Structure Decisions

	Mean Scores of CEOs of:	
	State-Owned Banks	Privately-Owned Banks
Possibility of a takeover bid	1.0	2.1**
Change in the ratio of public deficit to gross domestic product	1.7	1.4
Changes in the regulation and supervision framework	3.7	4.5
Private consumption behavior	1.1	1.9††
Currency market behavior	1.0	1.6**
Capital market performance	2.2	3.8**
World economy performance	1.4	2.0††
National economy performance	2.3	3.2†
Political instability	1.8	2.4
Change in the dynamics of credit demand	2.8	3.2
Change in firms' and investors' income taxation	1.9	3.1*
Legal restrictions on share repurchases	1.0	2.1**
Interest rate changes	1.7	2.9**

† Significant difference at the 5 percent level for one-sided tests. †† Significant difference at the 1 percent level for one-sided tests.
* Significant difference at the 5 percent level for two-sided tests. ** Significant difference at the 1 percent level for two-sided tests.

Not surprisingly, CEOs of privately-owned banks showed more concern with the influence of capital market performance than the CEOs of state-owned banks, and this difference is statistically significant (see legend of Table 5.4-B).[611] Overall, CEOs of both state-owned banks and privately-owned banks do appear to be not very preoccupied with threats of hostile takeover bids. However, the latter group is less unconcerned and this difference is also statistically significant (see legend of Table 5.4.2). We interpret this result as a consequence of the regulatory intervention in corporate control transactions.[612]

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[610] During 1999 in the aftermath of the obliteration of the strategic partnership with Banco Central Hispano, BCP bought back a stake of its equity capital higher than the 10 percent limit. Later, part of that stake was ultimately placed with other strategic partners. See Banco Comercial Português Annual Report 1999, p.15, 138.

[611] Statistical testing was performed using Wilcoxon-Mann-Whitney test.

[612] See chapter 3 for further details.

The examination of the responses of CEOs of listed and unlisted banks provides evidence supporting the hypothesis that those CEOs see differently the influence of capital market performance on bank capital structure decisions. This is consistent with the conventional wisdom that CEOs of listed banks are naturally more preoccupied with their stock price movements than unlisted counterparts (see Table 5.4-C). In contrast, we cannot find a reasonable explanation for listed and unlisted CEOs perceiving differently the effects of changes in currency markets and world economic performance on banks capital structure decisions.

Table 5.4-C
Influence of External Factors on the Bank Capital Structure Decisions

	Mean Scores of CEOs of:	
	Listed Banks	Unlisted Banks
Possibility of a takeover bid	2.3	1.5
Change in the ratio of public deficit to gross domestic product	1.6	1.4
Changes in the regulation and supervision framework	4.1	4.4
Private consumption behavior	1.7	1.6
Currency market behavior	1.8	1.3**
Capital market performance	4.1	2.8††
World economy performance	2.2	1.6†
National economy performance	3.3	2.8
Political instability	2.5	2.1
Change in the dynamics of credit demand	3.2	3.0
Change in firms' and investors' income taxation	3.3	2.5
Legal restrictions on share repurchases	2.3	1.5
Interest rate changes	2.2	2.8

† Significant difference at the 5 percent level for one-sided tests. †† Significant difference at the 1 percent level for one-sided tests.
*Significant difference at the 5 percent level for two-sided tests. ** Significant difference at the 1 percent level for two-sided tests.

Are there differences in how external factors affect CEOs of de novo and established banks in terms of capital structure decisions? To find out, we partitioned our sample by 'de novo' and 'established' banks. Table 5.4-D tabulates the survey results.

Table 5.4-D
Influence of External Factors on the Bank Capital Structure Decisions

	Mean Scores of CEOs of:	
	De Novo Banks	Established Banks
Possibility of a takeover bid	2.0	1.7
Change in the ratio of public deficit to gross domestic product	1.4	1.6
Changes in the regulation and supervision framework	4.6	4.0
Private consumption behavior	1.9	1.4
Currency market behavior	1.5	1.4
Capital market performance	3.3	3.3
World economy performance	1.8	1.8
National economy performance	3.1	2.8
Political instability	2.3	2.2
Change in the dynamics of credit demand	3.0	3.1
Change in firms' and investors' income taxation	3.0	2.6
Legal restrictions on share repurchases	1.9	1.7
Interest rate changes	3.2	2.0*

† Significant difference at the 5 percent level for one-sided tests. †† Significant difference at the 1 percent level for one-sided tests.
*Significant difference at the 5 percent level for two-sided tests. ** Significant difference at the 1 percent level for two-sided tests.

The only statistically significant (*p*-value: 0.0368) difference between relates to their perceptions in respect with the impact of interest rate changes on debt/equity decision-making, which is seen as unimportant by established banks CEOs (mean score 2.0) or trivial by CEOs of de novo banks.

Although we did not hypothesized any relationship between the leverage condition of banks — over- or under-capitalized in relation to the industry average capital ratio — and the perceptions of their CEOs about the potential effect of exogenous factors on capital structure policy, we conducted Wilcoxon-Mann-Whitney tests. These failed to reveal any statistical significance at the 5 percent level in two-sided tests. Thus, we are not presenting here those results.

Importance of Capital Market Development Capital Structure Decisions. Financial markets in capitalistic countries play an important role in allocating resources. The importance varies, however, according to the prevailing national governance system. Table 5.4.1 documents the results.

Table 5.4.1
Relevance of Capital Market Development on Bank Capital Structure Decisions

	[unit: percent]
Totally irrelevant	9.8
Largely irrelevant	5.9
Somewhat irrelevant	7.8
Somewhat relevant	13.7
Largely relevant	51.0
Totally relevant	11.8
Not sure / no opinion / Prefer not to answer	0.0

As expected, the majority (76.5 percent)[613] of the surveyed CEOs indicated that capital market level of development was "totally relevant", "largely relevant" or "somewhat relevant" to their capital structure decisions. This result is consistent with empirical evidence earlier developed for non-banking firms (e.g., Demirguç-Kunt and Maksimovic 1996). We might have expected this result to be even more robust had our sample not included CEOs of government-owned banks for whom capital market influences would, arguably, matter less (see Table 5.4.1.1).

Table 5.4.1.1
Relevance of Capital Market Development on Bank Capital Structure Decisions

[unit: percent]

	CEOs of:	
	State-Owned Banks	Privately-Owned Banks
Totally irrelevant	26.7	2.8
Largely irrelevant	13.3	2.8
Somewhat irrelevant	13.3	5.6
Somewhat relevant	26.7	8.3
Largely relevant	20.0	63.9
Totally relevant	0.0	16.7
Not sure / no opinion / Prefer not to answer	0,0	0,0

A one-sided Wilcoxon-Mann-Whitney test of independence of mean scores failed to detect statistical significance (*p*-value: 0.0561). A similar result was found when we compared the mean scores for listed and unlisted banks (*p*-value: 0.113).

Share Repurchases Restrictions on Bank Capital Structure Decisions. As is abundantly clear in the corporate finance literature, enforcing statutory restrictions on stock repurchase transactions is likely to exacerbate the *free cash flow* problem, particularly among mature banks with excess cash flow.[614] Shareholders may be deprived the use of an effective mechanism to promote the alignment between insiders' and outsiders' objective functions. Restrictions on share repurchase could be detrimental to maximizing economic value for two additional reasons. First, buying back shares increases insider ownership and

[613] A *Z*-test of a proportion reveals a value statistically above 0.5 at any reasonable level of significance (p-value: 0.00027).

[614] The importance of this public policy issue may be illustrated with case of Japanese authorities that after a long period of share repurchase transactions decided in 1995 legalized such transactions. For a rigorous legal examination of share repurchase transactions in Portugal and in some continental European regimes see Rocha (1994).

therefore contributes to a reduction in the agency costs associated with lax managerial effort and the excessive use of perquisites. Second, it has already been pointed out that share repurchases are an effective instrument in adjusting towards a bank's optimal capital structure. Table 5.4.2.1-A presents the results.

Table 5.4.2.1-A
Importance of on Share Repurchases Restrictions on Bank Capital Structure Decisions

[unit: percent]

Totally irrelevant	29.4
Largely irrelevant	17.6
Somewhat irrelevant	25.5
Somewhat relevant	25.5
Largely relevant	0.0
Totally relevant	0.0
Not sure / no opinion / Prefer not to answer	2.0

For a majority (72.5 percent)[615] of the respondents, the presence of a share repurchase limit was considered irrelevant for capital structure decisions. This result is statistically significant (*p*-value: 0.0021) at any reasonable level of significance. To further explore this result, we constructed Table 5.4.2.1-B to separate the responses of CEOs of both state-owned banks and privately-owned banks. A first observation reveals a different pattern of response.

Table 5.4.2.1-B
Importance of on Share Repurchases Restrictions on Bank Capital Structure Decisions

[unit: percent]

	CEOs of:	
	State-Owned Banks	Privately-Owned Banks
Totally irrelevant	46.7	22.2
Largely irrelevant	0.0	25.0
Somewhat irrelevant	40.0	19.4
Somewhat relevant	6.7	33.3
Largely relevant	0.0	0.0
Totally relevant	0.0	0.0
Not sure / no opinion / Prefer not to answer	6.7	0.0

Table 5.4.2.1-B shows that CEOs of privately-owned banks CEOs are less unanimous about the relative importance of legal restrictions on share repurchases as it impacts capital structure decisions. Only two thirds of them (compared to 86.7 percent of state-owned bank CEOs) indicate it as irrelevant. It is noteworthy that one third of

[615] The aggregate frequencies of 'totally irrelevant', 'largely irrelevant', and 'somewhat irrelevant' responses.

privately-owned bank's CEOs consider legal restrictions on share repurchase to be at least somewhat relevant.

Internal Determinants on Bank Capital Structure Decisions. Question number 5 queried bank CEOs about the degree of importance they ascribe to a number of internal factors that might impact capital structure decisions (see Table 5.5-A).

Table 5.5-A
Influence of Internal Factors on the Bank's Capital Structure Decisions

	Mean Scores
Get the bank's shares listed	3.3
Ownership structure and managerial control	4.6
Tax economies related to factors other than debt financing	2.4
Size of *free cash flow*	2.1
Earnings per share (avoid earnings dilution)	2.6
Historical performance of bank's shares	2.2
Dividend policy	3.1
Investment policy / Growth opportunities	4.0
Financing viability of strategic objectives	3.7
Assets' risk	3.2
Tax economies associated with debt financing	3.0
Correct *mispricing* in past security issues	2.0
Issuing costs	1.9
Bank size	3.3
Avoid *mispricing* in future security issues	1.8
Covenants in debt financing contracts	1.6
Rates of taxation on investors' income	1.9
Risk and costs of financial distress and insolvency	2.2
Managerial expectations for bank's future performance	3.4
Restructuring of bank's asset portfolio	2.6
Bank's reputation	3.8
Changes in bank's level of profitability	2.8

An examination of the overall results show that for survey participants, the most important internal factor for banks' capital structure decisions (with a mean score higher than 4) is ownership structure and managerial control. The internal factors regarded as least important (with a mean score lower than 2) are, the impact of covenants in debt financing contracts, the avoidance of future security issue mispricing, and minimizing floating costs. This evidence suggests that the sample's CEOs are preoccupied with the influence of the incentives associated with their banks' governance arrangements in capital structure decision-making, and less concerned with security design and transaction costs of security issuance. The CEOs' relative indifference (mean scores >3 and <4) towards the role of bank size, investment policy and growth, reputation, financial slack, managerial expectations, dividend policy, business risk, and debt financing tax-shields are also noteworthy.

Table 5.5-B
Influence of Internal Factors on the Bank Capital Structure Decisions

	Mean Scores of CEOs of:	
	State-Owned Banks	Privately-Owned Banks
Get the bank's shares listed	2.9	3.4
Ownership structure and managerial control	4.1	4.9
Tax economies related to factors other than debt financing	1.9	2.6
Size of free cash flow	2.0	2.1
Earnings per share (avoid earnings dilution)	2.2	2.8
Historical performance of bank's shares	1.1	2.6**
Dividend policy	3.5	3.0
Investment policy / Growth opportunities	3.5	4.2
Financing viability of strategic objectives	3.0	4.0
Assets' risk	3.7	3.0
Tax economies associated with debt financing	2.7	3.1
Correct mispricing in past security issues	1.4	2.3†
Issuing costs	1.1	2.2**
Bank size	3.4	3.3
Avoid mispricing in future security issues	1.1	2.1††
Covenants in debt financing contracts	1.0	1.8*
Rates of taxation on investors' income	1.7	1.9
Risk and costs of financial distress and insolvency	1.9	2.3
Managerial expectations for bank's future performance	3.8	3.2
Restructuring of bank's asset portfolio	1.9	2.9*
Bank's reputation	4.1	3.7
Changes in bank's level of profitability	2.5	2.9

† Significant difference at the 5 percent level for one-sided tests. †† Significant difference at the 1 percent level for one-sided tests.
*Significant difference at the 5 percent level for two-sided tests. ** Significant difference at the 1 percent level for two-sided tests.

There were some significant differences between state-owned and privately-owned banks with respect to perceptions of the influence of internal factors on bank capital structure decisions. CEOs of privately-owned banks were more concerned with (1) the historical performance of their banks' share price; (2) floating costs; (3) the inclusion of covenants in debt financing contracts; (4) correcting mispricing in past security issues; (5) avoiding mispricing in future issues; and (6) the restructuring of bank assets' portfolio. Nonetheless, while the differences between state and privately-owned banks were statistically different, all of these internal factors were deemed as relatively unimportant for capital structure decisions by both categories of Portuguese banks.

Table 5.5-C
Influence of Internal Factors on the Bank Capital Structure Decisions

	Mean Scores of CEOs of:	
	Listed Banks	Unlisted Banks
Get the bank's shares listed	4,6	2,4**
Ownership structure and managerial control	5,0	4,4
Tax economies related to factors other than debt financing	3,0	2,0*
Size of *free cash flow*	2,6	1,8†
Earnings per share (avoid earnings dilution)	3,4	2,2††
Historical performance of bank's shares	2,6	1,9*
Dividend policy	3,2	3,1
Investment policy / Growth opportunities	4,2	3,8
Financing viability of strategic objectives	4,4	3,3
Assets' risk	3,5	3,0
Tax economies associated with debt financing	3,7	2,5**
Correct *mispricing* in past security issues	2,6	1,7*
Issuing costs	2,2	1,7
Bank size	3,6	3,2
Avoid *mispricing* in future security issues	2,3	1,6
Covenants in debt financing contracts	2,2	1,2*
Rates of taxation on investors' income	2,5	1,5†
Risk and costs of financial distress and insolvency	2,6	1,9
Managerial expectations for bank's future performance	3,6	3,3
Restructuring of bank's asset portfolio	3,1	2,4
Bank's reputation	4,6	3,4*
Changes in bank's level of profitability	3,8	2,3**

† Significant difference at the 5 percent level for one-sided tests. †† Significant difference at the 1 percent level for one-sided tests.
*Significant difference at the 5 percent level for two-sided tests. ** Significant difference at the 1 percent level for two-sided tests.

The analysis of Table 5.5-C leads us to conclude that being the CEO of a listed bank is the most relevant discriminating criterion in evaluating the effects of internal factors on capital structure decisions. We found statistically significant differences in: (1) banks' listing; (2) debt financing tax-shields; (3) correcting past security's mispricings; (4) investors' income tax rates; (5) changes in banks' profitability and reputation; (6) covenants in debt financing contracts; (7) historical performance of banks' stock prices; and (8) avoiding earnings per share dilution. These findings are consistent with the conventional wisdom that the objective function of privately-owned firms is more influenced by market discipline when compared to state-owned firms.

We attempted to uncover statistically significant relations between CEOs of 'de novo' and 'established' banks with respect to the presumable influence of banks' endogenous factors on their capital structure policy (Table 5.5-D).

Table 5.5-D
Influence of Internal Factors on the Bank Capital Structure Decisions

	Mean Scores of CEOs of:	
	De Novo Banks	Established Banks
Get the bank's shares listed	2.8	3.6
Ownership structure and managerial control	4.8	4.5
Tax economies related to factors other than debt financing	2.3	2.5
Size of free cash flow	1.9	2.3
Earnings per share (avoid earnings dilution)	2.5	2.7
Historical performance of bank's shares	2.0	2.3
Dividend policy	2.8	3.4
Investment policy / Growth opportunities	3.8	4.1
Financing viability of strategic objectives	3.9	3.6
Assets' risk	2.8	3.6*
Tax economies associated with debt financing	2.8	3.1
Correct mispricing in past security issues	2.0	2.0
Issuing costs	1.8	1.9
Bank size	3.3	3.4
Avoid mispricing in future security issues	1.8	1.9
Covenants in debt financing contracts	1.3	1.8
Rates of taxation on investors' income	1.5	2.2
Risk and costs of financial distress and insolvency	1.9	2.4
Managerial expectations for bank's future performance	3.1	3.6
Restructuring of bank's asset portfolio	2.4	2.9
Bank's reputation	3.5	4.2*
Changes in bank's level of profitability	2.7	3.0

† Significant difference at the 5 percent level for one-sided tests. †† Significant difference at the 1 percent level for one-sided tests.
*Significant difference at the 5 percent level for two-sided tests. ** Significant difference at the 1 percent level for two-sided tests.

CEOs of 'established' banks seemed more concerned with the potential influence of bank reputation on capital structure decision-making and the difference is significant at the 5 percent level for a two-sided Wilcoxon-Mann-Whitney test (p-value: 0.0500). This result suggests, as discussed in Chapter 3, that managers of higher franchise value banks might adopt low risk-taking policies in an attempt to prevent losing some (or all) franchise value. This kind of risk averse behavior seems more unlikely among managers of 'de novo' banks since they typically pursue more aggressive growth strategies, at least in the early stages of their banks' life cycles.[616] For CEOs of these banks, asset risk appears to be less important than for their 'established' banks counterparts (p-value: 0.0423). This evidence is consistent with our previous argument.

[616] Empirical findings by DeYoung and Hasan (1998) indicate that in a large sample of U.S. commercial banks, asset growth rates for banks with less than 14 years ('de novo' banks) and with more than 14 years ('established' banks) were estimated at 21.5 percent and 6.6 percent, respectively. 'De novo' banks mean is statistically larger than the established banks mean at the 1 percent significance level.

Table 5.5-E presents the results on the influence of endogenous factors on banks' capital structure decisions. The partitioning of the sample was made using the same binary variable — 'over-capitalized', 'under-capitalized' banks — constructed as we explained earlier in this chapter.

Table 5.5-E
Influence of Internal Factors on the Bank Capital Structure Decisions

	Mean Scores of CEOs of:	
	Over-Capitalized Banks	Under-Capitalized Banks
Get the bank's shares listed	2.8	3.9
Ownership structure and managerial control	4.7	4.6
Tax economies related to factors other than debt financing	2.2	2.7
Size of free cash flow	1.6	2.7*
Earnings per share (avoid earnings dilution)	2.5	2.8
Historical performance of bank's shares	2.1	2.3
Dividend policy	3.1	3.2
Investment policy / Growth opportunities	3.8	4.2
Financing viability of strategic objectives	3.2	4.4†
Assets' risk	2.7	3.9††
Tax economies associated with debt financing	2.6	3.3†
Correct mispricing in past security issues	1.5	2.7††
Issuing costs	1.7	2.0
Bank size	2.8	3.9†
Avoid mispricing in future security issues	1.4	2.4*
Covenants in debt financing contracts	1.2	2.0*
Rates of taxation on investors' income	1.6	2.2
Risk and costs of financial distress and insolvency	1.7	2.7
Managerial expectations for bank's future performance	3.2	3.6
Restructuring of bank's asset portfolio	2.2	3.2*
Bank's reputation	3.4	4.3*
Changes in bank's level of profitability	2.2	3.6††

† Significant difference at the 5 percent level for one-sided tests. †† Significant difference at the 1 percent level for one-sided tests.
*Significant difference at the 5 percent level for two-sided tests. ** Significant difference at the 1 percent level for two-sided tests.

The mean scores whose differences between the two groups of CEOs were found statistically significant include: financing viability of strategic objectives, covenants in debt contracts, changes in profitability, reputation in product markets, size of free cash flow, bank size, asset risk, restructuring of asset portfolio, and security mispricings. Although varying in their relative importance (between the two cohorts of CEOs), we conclude that the theoretical determinants of firm value — cash flow stream and risk-adjusted cost of capital — are relevant considerations for capital structure decision-making.

Agency Problems. Agency problems arising in the equityholders – managers' contractual relationships are an important consideration in defining and adjusting a capital

structure. Questions 6 and 7 address disparate incentives among managers, owners and debtholders over managerial decision-making and bank policies. Question 6 deals with one such problem — the free cash flow hypothesis — which was first identified by Michael Jensen in 1986 (see also Stulz 1990). As earlier discussed (see Chapters 2 and 3), in certain instances managers may behave with self-interest and increase their utility (wealth) to the detriment of equityholders by overinvesting firms' free cash flow rather than paying it out to owners. The free cash flow theory predicts greater agency costs for diffusely held and publicly traded firms that experience overinvestment problems as a result of managerial discretion over firm's free cash flow. These agency costs, arguably, do play a role in capital structure policy.[617] According to the theory, firms with large free cash flow should, ceteris paribus, return excess cash to owners either through share repurchases or specially designated dividends. These cash disbursements may be seen as a substitute for stock buybacks (Gombola and Liu 1999). An alternative mechanism for reducing this agency problem is to leverage up the capital structure, thus soaking up the extra cash in debt service payments. If free cash flow is large and repurchase of shares, designated dividends, or high debt financing were employed, then we would interpret the circumstances as indicating the presence of overinvestment agency costs.

Table 5.6.1
Capital Structure Decisions under Large Free Cash Flow

	[unit: percent]
Anticipated debt repayment	25.5
Share repurchase	12.7
New issue of stock	1.8
New issue of debt	0.0
Not sure / no opinion / Prefer not to answer	41.8
Other	18.2

The results of this question must be viewed in the proper context. First, the percentage of CEOs who were either not sure about the answer, had no opinion or preferred not to answer, was the largest in the survey results (at 41.8 percent). Second, although theory dictates that managers of banks experiencing large free cash flows (FCF) should return it to owners, the Portuguese bank context has at least two important constraints. First, as previously noted, Portugal enforces a 10 percent (of equity)

[617] In this context managers are assume to have negligible ownership holdings.

mandatory limit on share repurchases. Second, equity capital of most Portuguese banks is not widely held therefore a separation between management and of ownership is usually absent. These idiosyncratic features of Portuguese banking undermine the usefulness of the data from the two following (sub)questions, not to mention the fact that the majority of those surveyed CEOs did not provide usable answers. Results are presented in Tables 5.6.2 and 5.6.3.

Table 5.6.2
Bank's Ownership Structure under Large Free Cash Flow and New Debt Issuance

	[unit: percent]
Diffuse, but with major shareholder(s) and limited managerial ownership	11.8
Diffuse, but with major shareholders(s) and significant managerial ownership	0.0
Diffuse, no major shareholder(s) and limited managerial ownership	0.0
Diffuse, no major shareholder(s) and significant managerial ownership	0.0
Concentrated and limited managerial ownership	11.8
Concentrated and significant managerial ownership	2.0
Not sure / no opinion / Prefer not to answer	60.8
Other	13.7

Table 5.6.3
Managerial Behavior under Diffuse Ownership and Large Free Cash Flow and New Debt Issuance

	[unit: percent]
Propensity for managers to adopt projects with a high risk-return profile	13.0
Re-equilibrium of managerial engagement-compensation relationship	33.0
Discretionary fruition of perquisites inherent to the function in office	34.0
Other	58.1

Impact of Financial Leverage on Investment Policy. Owners may have an incentive to transfer wealth to themselves at debtholders expense by taking on excess risk via a highly leveraged capital structure. To test this hypothesis, we need to obtain a statistically significant proportion of CEOs responding that higher leverage should increase the propensity for adopting higher risk-return projects. Question 7.1 addresses this topic and Table 5.7.1-A tabulates the responses.

Table 5.7.1-A
Impact of Financial Leverage on Investment Policy

	[unit: percent]
Increased the propensity for adopting higher risk-return projects	0.0
Increased the propensity for adopting lower risk-return projects	24.0
No influence	50.0
Not sure / no opinion / Prefer not to answer	20.0
Other	6.0

Half of survey participants viewed the impact of increased financial leverage on banks' investment policy as inconsequential, while 20 percent were unsure or unwilling to

answer the question. However, none of the CEOs indicated that financial leverage would *increase* the propensity for undertaking higher risk projects. Twenty four percent indicated a preference for undertaking low risk projects in the face of high leverage, suggesting some degree of managerial risk aversion. We conclude for the absence of empirical support for the hypothesis.

To search for potential differences between state-owned and privately-owned bank CEOs with built Table 5.7.1-B.

Table 5.7.1-B
Impact of Financial Leverage in Investment Policy

[unit: percent]

	CEOs of:	
	State-Owned Banks	Privately-Owned Banks
Increased the propensity for adopting higher risk-return projects	0.0	0.0
Increased the propensity for adopting lower risk-return projects	14.3	28.6
No influence	71.4	40.0
Not sure / no opinion / Prefer not to answer	14.3	22.9
Other	0.0	8.6

On average, CEOs of state-owned banks were much less preoccupied with the risks of highly leveraged capital structures and more willing to answer this question. They also exhibited greater agreement about the "No influence" category (71.4 percent) and were therefore more likely to be unconstrained in their growth strategies even when highly leveraged.

Influence of Financial Distress upon Investment Policy. In financial distress situations it has been shown that inefficient investment policies may be undertaken. Owners are likely to perceive that debtholders may benefit from positive NPV investment projects and consequently they may underinvest. To test this hypothesis, we need to obtain a statistically significant proportion of CEOs responding that in financial distress new stock would not be issued to fund value-enhancing projects. Question 7.2 explores this area. Results are included in Table 5.7.2.

Table 5.7.2
Influence of Financial Distress upon Investment Policy

[unit: percent]

Induced new stock issues to fund enhancing-value projects	26.0
Did not induce new stock issues to fund generating enhancing-value projects	6.0
No influence	34.0
Not sure / no opinion / Prefer not to answer	20.0
Other	14.0

A majority of 54 percent considered that a financial distress situation has no influence on investment policy (34 percent), or did not provide a usable answer (20 percent). The number of CEOs indicating that they would not underinvest is 6 percent. Thus, the proposition failed to be supported by the evidence.

Pattern of Debt Issuance. Question 8 queries CEOs about the characterization of the pattern of debt issuance followed during their tenure. Underlying this question is the observation that one way to leverage-up a bank's capital structure is through sequential debt offerings. However, under the assumption that debt contracts are not renegotiable, this financing behavior could create the agency problem known as claim dilution.[618]

Table 5.8
Pattern of Bank Debt Issuance

	[unit: percent]
Alternated with stock issues	27.5
Successive issues	19.6
Not applicable	39.2
Other	9.7
Not sure / no opinion / Prefer not to answer	4.0

Almost 40 percent of the CEOs responses indicated that this query was not applicable to the their own bank. Less than 20 percent of the CEOs declared that their banks followed a sequential debt issuing. These results are considered inconclusive and consequently were not the object of any statistical testing.

Tax Effects on Capital Structure Decisions. It is often suggested in the literature that we should expect income taxes — at both the firm and personal levels — to influence capital structure choice. However, theoretical predictions are, in general, not confirmed in empirical observation.

It is also well documented that banks, among other firms, react to major changes in income tax laws (e.g., Scholes, Wilson and Wolfson 1990). This finding has provided support for a substantial number of empirical tests of the tax hypothesis in the literature. In question 9.1 CEOs are questioned about the impact of changes in bank taxation rules on their capital structure decisions.

[618] See Chapter 2 for further details.

Table 5.9.1
Impact of Changes in Taxation on Bank Capital Structure Decisions

	Mean scores	Percent
Taxation on dividends	3.3	
Taxation on capital gains earned on bank's shares	2.8	
Taxation on interest earned on bank's debt issues	3.4	
Taxation on the bank's income	4.7	
Not sure / no opinion / Prefer not to answer		9.8
Other		5.9

Examination of the survey results suggests that respondents do not perceive tax considerations as playing a significant role in banks' capital structure decisions (see Tables 5.5.1 to 5.5.3). However, CEOs of privately-owned banks and of listed banks tend to ascribe more relevance to the impact of taxation than other respondents. Furthermore, those differences are often significant with respect to CEOs of listed and unlisted banks. For the former, the importance assigned to the income tax effects of borrowing cost payments is not negligible. To test the differences in the mean scores of "Taxation on the bank's income" versus the tax categories that are relevant at the investor level, we conducted three Wilcoxon signed-ranks tests. These revealed that the differences are statistically significant even at less than 1 percent level of significance (all p-values < 0.0001). We interpret this outcome as supportive of the tax hypothesis, in the sense that CEOs give more importance to the income taxes at the bank level than at the investor level. This result is consistent with the evidence provided by CEOs on question 5, dealing with a series of internal factors influencing a bank's capital structure planning.

Income tax laws at the personal level treat payments to investors in the form of dividends, interests or capital gains differently. Miller (1977) argued that differential treatment of investors' taxable income introduces incentives that are likely to affect the demand for different types of corporate securities. Hence, taxation at the personal level should be incorporated into the corporate capital structure equation. Question 9.2 attempts to assess the CEOs' view about the impact of such differences in taxation at the investor level.

Table 5.9.2
Impact of Differences in Taxation of Investors Returns on Bank Capital Structure Decisions

	[unit: percent]
Totally irrelevant	11.8
Largely irrelevant	13.7
Somewhat irrelevant	11.8
Somewhat relevant	9.8
Largely relevant	45.1
Totally relevant	0.0
Not sure / no opinion / Prefer not to answer	7.8

Empirical evidence collected on this question is largely inconclusive in our survey[619] but seems consistent with previously discussed results (see Question 5).

Question 9.3 was designed to ascertain the relevance of the third proposition of DeAngelo and Masulis (1980) discussed in Chapters 2 and 3 that, cross-sectionally, firms endowed with non-debt-related tax shields should exhibit higher capital ratios, i.e., carry relatively less debt in their balance sheets. We queried CEOs about the influence of non-debt tax shields, such as depreciation and provisions for loan-losses, on banks' capital structure decisions. As discussed earlier, provisions for loan losses are potentially a substantial and discretionary source of non-debt income tax relief for banks. Thus we should expect banks, *ceteris paribus*, to resort to debt financing less often if they are creating larger loan loss reserves.

Table 5.9.3
Role of Non-Debt Tax-Shields on Banks' Capital Structure Decisions

	[unit: percent]
Totally irrelevant	11.8
Largely irrelevant	25.5
Somewhat irrelevant	7.8
Somewhat relevant	27.5
Largely relevant	17.6
Totally relevant	5.9
Not sure / no opinion / Prefer not to answer	3.9

The relative importance of fixed assets as a proportion of total assets is quite small for Portuguese banks.[620] Consequently, annual depreciation tends to be a minor

[619] We conducted a two-sided Z-test for a proportion to see if we could conclude that either the respondents that assigned any degree of relevance or those who did not, were a majority of the valid responses. The test failed to provide evidence in that respect.
[620] Author's estimates indicate that, on average, during the period 1989-1998 fixed assets represented 2.84 percent of net total assets and their depreciation accounts for 2.57 percent of the total costs for the banks

consideration in determining capital structure and, therefore, play a negligible role as a debt tax-shield substitute. In contrast, provisions for loan-losses are substantial.[621] Arguably, banks' CEOs might regard them as a reasonable substitute for debt tax-shields.

The distribution of the survey responses, however, suggests a mixed picture; therefore we must treat these results as inconclusive[622] and not providing empirical support for the hypothesis. Loan loss reserves may be important for other reasons, but these were not tested in our survey. Some arguments might be offered, however, in an attempt to better interpret the evidence. For instance, the discretionary part of loan-loss provisions might be used for signaling purposes (e.g. Beatty, Chamberlain and Magliolo 1995; Moyer 1990).[623] Or they may be used as an income smoothing mechanism (e.g., Greenawalt and Sinkey 1988). Also, loan-loss provisions might be instrumental in managing a bank's capital base (e.g., Ahmed, Takeda and Thomas 1999). Finally, the change in capital regulations also reduces the cost of earnings management, or smoothing.[624] In general, increasing earnings by reducing loan loss provisions results in a greater reduction in capital under the old regulatory regime than under the new regime. This implies that smoothing earnings via loan-loss provisions is less costly in the new regime. Affirming the relevance of non-debt tax-shields, such as loan-loss provisions, on the bank's capital structure decisions affirms its role as a device for managing earnings.

According to the tax hypothesis, we should expect, ceteris paribus, some degree of indifference in issuing equity or debt securities in a framework of tax neutrality between

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included in APB's sample. According to Houston, James and Marcus (1997) banks in the U.S., on average, invest in real assets less than 3 percent of their total assets.

[621] Author estimates that, on average, allowances for bad debt and financial investments represented on average 11.47 percent of total costs, for the banks included in APB's sample during the period 1989-1998.

[622] We performed the same statistical test as in the previous question with similar results. See footnote 19.

[623] These authors used samples of U.S. banks. Beaver *et al*. (1989) suggest that investors interpret an increase in loan-loss provisions as a sign of strength. Consistent with this signaling hypothesis, Wahlen (1994) documents a positive relation between (unexpected) loan-loss provisions and future pre-loan-loss earnings changes as well as contemporaneous stock returns. Beaver and Engel (1996) document that the valuation coefficients on the 'discretionary' and 'non-discretionary' components of loan-loss provisions are positive and negative, respectively, consistent with the signaling hypothesis. For conflicting evidence see Bishop (1996) (for banks), Collins, Shackelford and Wahlen (1995) and Stinson (1993) (for savings and loans).

[624] Current capital adequacy requirements limit the use of loan loss reserves as regulatory capital in two ways. First, they are not allowed as primary capital (Tier I). Second, they are only accepted up to 1.25 percent of risk-weighted total assets. Current rules determine a less negative relationship between capital (measured before loan-loss reserves) and loan-loss provisions than the old regime because low-capital banks have less incentive to increase loan-loss provisions under the current capital regulations. In addition, the

those two financing options. Question 9.4 asks what would happen to the relative use of debt and equity financing if a hypothetical change in tax laws allowed dividends payouts to be tax deductible, like debt financing costs. See results in Table 5.9.4.

Table 5.9.4
Bank's Security Issuance under Dividend Payout Tax Deductibility

	Mean score	Percent
Rate of agreement	4.1	70.6
Not sure / no opinion / Prefer not to answer		29.4
Degree of agreement: 6		38.9
Degree of agreement: 5		16.7
Degree of agreement: 4		0.0
Degree of agreement: 3		13.9
Degree of agreement: 2		16.7
Degree of agreement: 1		13.9

Although the mean score (4.1) reveals some agreement with our hypothesis, CEOs have widely different opinions in this question, as shown by the large number of extreme responses in Table 5.9.4. One possible explanation is that some banks in the survey have special tax situations, which influence their CEOs' responses. Therefore these results must be interpreted cautiously.[625]

It is widely accepted that firms react to major changes in corporate income tax laws. This understanding provides support for a substantial number of empirical tests of the *tax hypothesis*. In question 9.5 survey participants are asked for their reactions to a postulated modification of Portuguese tax laws similar to the U.S. law that eliminated the tax allowance on borrowing costs for very long-term maturity debt issuances (more than 40 years).

current regulations make it less attractive for low capital banks that have exceeded the upper limit on loan-loss reserves to increase loan-loss provisions any further.

[625] This argument is supported by the large variability in the implicit tax rates as shown for instance in the standard deviation (0.177 for a mean of 0.229) computed for a sample of Portuguese banks in 1998. For further details see Chapter 4.

Table 5.9.5
Effect of a Change in Debt Tax-Shield Regime

	Mean score	Percent
Rate of likelihood	4.4	80.4
Not sure / no opinion / Prefer not to answer		19.6
Degree of agreement: 6		33.3
Degree of agreement: 5		33.3
Degree of agreement: 4		11.1
Degree of agreement: 3		22.2
Degree of agreement: 2		8.3
Degree of agreement: 1		5.6

The mean score (4.4) indicates a moderate concordance with the Modigliani and Miller (1963) tax hypothesis. A statistically significant majority of 77.7 percent of the valid responses indicates a degree of agreement of 4 or greater.

Question 9.6 queries CEOs about the influence of tax-loss carryforwards on capital structure decisions. Under most taxation regimes, tax-loss carryforwards are a source of future tax savings that are achievable via reduction in future taxable income and/or marginal tax rates. If taxation is influential in capital structure decision-making, then tax-loss carryforwards are likely to meaningfully affect a bank's debt-equity choice. Thus, if tax-loss carryforwards are large and greatly reduce future taxable income, then they become a substitute for other tax-shields, such as interest expense on debt financing. Therefore, a bank earning taxable operating income and carrying tax-loss carryforwards would not, all other things being equal, issue additional tax-deductible debt.[626] Hence, according to the theory, firms in these circumstances may be impelled to reduce their use of debt financing as a tax-shield. Question 9.6.1 provides a test to this hypothesis.

Table 5.9.6
Impact of Tax-loss Carryforwards on Banks' Capital Structure Decisions

	[unit: percent]
Totally irrelevant	7.8
Largely irrelevant	11.8
Somewhat irrelevant	9.8
Somewhat relevant	19.6
Largely relevant	35.3
Totally relevant	3.9
Not sure / no opinion / Prefer not to answer	11.8

[626] According to the *exhaustion of sources of tax economies hypothesis* firms that exhausted their sources of tax economies or have lower or nonexistent taxable income are less likely to issue debt at margin (MacKie Mason 1990).

A majority of the respondents (62.5 percent) deemed tax-loss carryforwards as relevant for capital structure decisions. A test for the equality of that percentage is statistically significant at the 5 percent level (*p*-value: 0.0369). This evidence is consistent with the DeAngelo and Masulis (1980) theory.

According to that theory, tax-shields provided by interest payments on debt financing become much less important once banks are able to offset their income tax liability using available tax-loss carryforwards. It might even happen that taxable income was totally exhausted by the tax-loss carryforwards and consequently nothing was left to offset borrowing costs payments. Thus, we expect that banks holding tax-loss carryforwards would prefer, for tax purposes, to issue stock rather then debt.

Table 5.9.6.1
Security Issuance of Banks with Tax-Loss Carryforwards

[unit: percent]

Stock	67.9
Debt	7.1
Indifferent	17.9
Not sure / no opinion / Prefer not to answer	7.2

In responding to this question, 67.9 percent (*p*-value 0.0037) of the CEOs indicate that banks carrying tax-loss carryforwards in their balance sheets were more likely to issue equity securities. Again, the evidence supports DeAngelo and Masulis' (1980) proposition that a firm endowed with tax-shelters other than from borrowing costs could, *ceteris paribus*, issue less debt for the purpose of managing its income tax liability.

Influence of Capital Markets on the Timing of New Securities Issues. Questions 10.1 and 10.2 inquiry about the influence of capital market conditions on the timing of a new issue of either common stock or debt. Capital market conditions and informational asymmetries (e,g. Dierkens 1991), arguably, might affect the timing of a new issue of securities. See results in Table 5.10.

Table 5.10
Effect of Capital Market Conditions on the Timing of New Security Offerings

[unit: percent]

	Common Stock	Debt
Totally irrelevant	15.7	5.9
Largely irrelevant	7.8	7.8
Somewhat irrelevant	3.9	3.9
Somewhat relevant	13.7	21.6
Largely relevant	37.3	51.0
Totally relevant	3.9	3.9
Not sure / no opinion / Prefer not to answer	17.6	5.9

The value of the chi-square statistic (21.614 with 4 degrees of freedom) suggests the existence of a relationship between capital market conditions and the timing of new equity and debt offerings (*p*-value: 0.00024). The literature on the chi-square test requires a minimum threshold for the expected count per cell (under the hypothesis of independence). This criterion was clearly not met with our original categories. Therefore, we collapsed the original categories in order to overcome the problem created by the small number of observations. Although this brought us closer to the required criterion, 55.6 percent of the cells still had expected frequencies smaller than the minimum threshold (5). Hence, the requirement for a chi-square approximation is not strictly met and previous results should be interpreted cautiously.

Influence of Stock Price Performance on the Timing of New Securities Issues. Question number 11 looks at the influence of bank stock price performance on the timing of new debt or equity offerings. It is often suggested in the literature that managers time their decisions to go to the capital markets based upon overall market conditions and their own stocks price performance. Table 5.11 addresses this issue.

Table 5.11
Effect of Bank Stock Price Performance on the Timing of New Security Offerings

	[unit: percent]
Totally irrelevant	11.8
Largely irrelevant	0.0
Somewhat irrelevant	9.8
Somewhat relevant	13.7
Largely relevant	39.2
Totally relevant	2.0
Not sure / no opinion / Prefer not to answer	23.5

Approximately 55 percent of the CEOs considered as "somewhat relevant" or higher the effect of a bank's stock price performance on the timing of new security offerings. A Z-test of a proportion shows that the result is statistically significant (p-value: 0.0104) at the 5 percent level. Thus, we can reject the null hypothesis that a majority of 50 percent of the CEOs does not time new security offerings to their stock price performance.

Influence of Growth Opportunities on New Security Offerings. Question 12 asks CEOs how they perceive attractive investment opportunities to affect decisions on new financing issues. This topic is also addressed in question 21, which aims at ascertaining the effect of new investment opportunities on a budget-constrained bank's capital structure policy. Table 5.12 presents the survey results to this question.

Table 5.12
Influence of Growth Opportunities on New Security Issuance Decision

	[unit: percent]
Totally irrelevant	13.7
Largely irrelevant	3.9
Somewhat irrelevant	7.8
Somewhat relevant	19.6
Largely relevant	45.1
Totally relevant	0.0
Not sure / no opinion / Prefer not to answer	9.8

An (exact) Fisher test of independence was conducted to study the association between the responses to question 12 and to the effect of the underinvestment problem on bank capital structure (question 21). The test was applied to a 2 X 2 contingency table constructed as follows: in question 12 we differentiated the CEOs who assigned any degree of relevance to investment opportunity set for capital structure decision-making from those who did not provide such an indication. Concerning question 21, we distinguished CEOs who only indicated that they might consider deviating (temporarily) from the typical capital structure or from the traditional financing policy to implement an investment opportunity (in a budgetary constrained framework) from CEOs who indicated they would take some other action. We hypothesize that CEOs declaring any degree of relevance in their response to question 12 were more likely to consider withdrawing (temporarily) from prevailing capital structure strategies. The results show some support for this hypothesis. In the group of CEOs that indicated investment opportunities were relevant to their banks' capital structure decisions, 63.6 percent admitted a willingness to deviate from the their bank's usual capital structure limits. The corresponding proportion of CEOs who did not feel ready to temporarily violate capital structure limits was 33.3 percent. The difference between these proportions is significant at a 5 percent significance level (p-value 0.037). Thus, we conclude that indeed growth opportunities influence capital structure policy.

Bank's Average Cost of Capital versus Industry Average. The evidence presented earlier on question 2 showed that minimizing a bank's (opportunity) cost of capital was a relevant consideration in the financial management of a bank. Question 13 asks CEOs to compare the perceptions about their own individual banks' (weighted) average cost of

capital relative to what they believed to be the industry average, thus allowing us to infer about the difference between the two costs of capital.[627]

Table 5.13
Bank's Average Cost of Capital versus Industry Average

	Mean score	Percent
Degree of comparability	3,3	54.9
Similar		33,3
Not sure / no opinion / Prefer not to answer		11.8

We performed a Wilcoxon signed-ranks test and did not find any evidence (T29=167) that, on average, CEOs perceived the cost of capital of their banks to be either above or below the industry average as they estimated it at the time.

Deadweight Costs of Asymmetric Information. Question 14 attempted to estimate the deadweight costs of asymmetric information as perceived by the CEOs queried. We asked them to estimate the percentage reduction in the average cost of capital they would require in exchange for conveying a piece of private information to market participants (including competition).

Table 5.14
Estimate of the Deadweight Costs of Asymmetric Information

		Percent
Percentage points reduction in the average cost of capital	0.67	23.5
Not sure / no opinion / Prefer not to answer		76.5

A great majority (76.5 percent) of CEOs was unsure, unable or unwilling to answer this question. Consequently we had to drop it from the analysis.

Bankruptcy Effects on Capital Structure Decisions. As previously observed, under a number of legal regimes, insolvency problems of banks are handled using a very specific set of rules. It is suggested in the banking literature that this peculiarity might allow a bank's bankruptcy proceedings to be handled more efficiently, perhaps because the rules have been so well developed. Therefore it may be hypothesized that this would mean less time spent in bankruptcy and less costs involved in that process. To test this hypothesis, question 15 asks survey participants how they evaluated the time consumed and costs

[627] Several authors (e.g., see Marsh 1982) suggest that the industry average debt ratio (the complement of capital ratio) might be an appropriate surrogate for the measurement of the optimal target capital structure measure. Similarly, the individual bank's cost of capital can be related to that of the industry.

incurred in the proceedings of a hypothetical bank's bankruptcy case *vis à vis* that of a non-banking firm.

Table 5.15
Effects of Insolvency in Bank Bankruptcy Proceedings

	[unit: percent]
More time consumed and more costs incurred than other kinds of firms	49.0
More time consumed but less costs incurred than other kinds of firms	3.9
Less time consumed but more costs incurred than other kinds of firms	5.9
Less time consumed and less costs incurred than other kinds of firms	9.8
Same time consumed but more costs incurred than other kinds of firms	0.0
Same time consumed but less costs incurred than other kinds of firms	0.0
Same time consumed and same costs incurred as other kinds of firms	2.0
Not sure / no opinion / Prefer not to answer	29.4

In responding to question number 15, which queried about attitudes towards the threat of insolvency in terms of time consumed and costs involved, 29.4 percent of the CEOs answered "Not sure / no opinion" or "Prefer not to answer," thus severely limiting the statistical significance of this response. In contrast with our expectations, 71.4 percent of the valid responses indicated the belief that bankruptcy proceeding in the banking industry consume more time and involve more costs than is true in similar procedures for non-banking firms. That group represented 69.4 percent (*p*-value 0.0303) of the valid responses. While the *p*-value shows statistical significance at the 5 percent level, caution must be exercised here since almost 30 percent of the responses in the survey were not usable.

The too big too fail doctrine is a well-known proposition in the banking literature. Question 16 aimed at evaluating the importance assigned by CEOs to the relationship of bank size to the likelihood of bankruptcy. The motivation here was to test attitudes towards the too-big-to-fail doctrine, which suggests that the direct costs and the negative externalities associated with the failure of a particular bank, may induce regulatory and supervisory authorities to 'rescue' that bank, instead of letting it entering into bankruptcy proceedings. Table 5.16-A presents the results.

Table 5.16-A
Impact of Bank Size upon the Risk of Bankruptcy

[unit: percent]

Totally irrelevant	2.0
Largely irrelevant	0.0
Somewhat irrelevant	0.0
Somewhat relevant	13.7
Largely relevant	72.5
Totally relevant	7.8
Not sure / no opinion / Prefer not to answer	4.0

More than 94 percent (48 CEOs) of the responses on this question indicated some degree (from 'some' to 'total') of importance to the influence of bank size on the risk of bankruptcy. From those CEOs, 37 (i.e., 77 percent of the usable responses) assigned a large importance to that influence. To test if this percentage (77 percent) is statistically different from one half, we conducted a Z-test of a proportion and found statistical significance at any reasonable level (p-value: 0.00026). Therefore we interpret this evidence as consistent with the too big too fail proposition.

However, our previous conclusion does not appear to be challenged when we analyze the responses of CEOs of state-owned or privately-owned banks. Table 5.16-B presents the results.

Table 5.16-B
Impact of Bank Size upon the Risk of Bankruptcy

[unit: percent]

	CEOs of:	
	State-Owned Banks	Privately-Owned Banks
Totally irrelevant	6.7	0.0
Largely irrelevant	0.0	0.0
Somewhat irrelevant	0.0	0.0
Somewhat relevant	0.0	19.4
Largely relevant	66.7	75.0
Totally relevant	20.0	2.8
Not sure / no opinion / Prefer not to answer	6.7	2.8

A very substantial majority of CEOs assigned large or total importance to the influence of bank size on the likelihood of bankruptcy: 86.7 percent of the CEOs of state-owned banks, and 94.4 percent of the CEOs of privately-owned banks.

Bankruptcy Costs. It is widely accepted in the literature that an economic environment characterized by imperfect and incomplete markets, contains a positive

probability of costly bankruptcy.[628] How costly remains an empirical question. Question 17 is a hypothetical inquiry about CEOs estimates of (direct and indirect) bankruptcy costs. In this question we asked bank CEOs to estimate of the loss of total net asset value that would result from (a hypothetical) bank bankruptcy. Table 5.17 presents the evidence on this question.

Table 5.17
Estimate of Bankruptcy Costs

	[unit: percent]
No reduction in the book value of assets	0.0
0 to 10 reduction in the book value of assets	12.8
From 10 to 20 reduction in the book value of assets	4.3
From 20 to 30 reduction in the book value of assets	10.6
From 30 to 40 reduction in the book value of assets	2.1
From 40 to 50 reduction in the book value of assets	0.0
More than 50 reduction in the book value of assets	17.0
Not sure / no opinion / Prefer not to answer	53.2

Since bankruptcy costs is a contentious issue (see Chapter 2), it is not surprising that more than half (53.2 percent) of surveyed CEOs were unsure, unable or unwilling to provide a usable answer. However, no CEO maintained that bankruptcy in banking is costless. Given the small number of usable observations and the disparity in the responses, no statistical tests were performed on the data.

Motives for Issuing Convertible Securities. Among the reasons most frequently suggested in the literature for a firm issuing hybrid financing instruments such as convertible bonds or convertible preferred stock are:[629] (1) the potential for reducing agency costs associated with equityholder - manager conflicts of interest (e.g., Lewis, Rogalski and Seward. 1999, Barnea, Haugen and Senbet 1981); (2) to protect against a future drop in stock price; (3) to increase the marketability of the offering (e.g., Amihud and Mendelson 1988); (4) to lower issuing costs; (5) for tax considerations (e.g., Houston and Houston 1990); and (6) to lower the regulatory costs of primary capital compliance (Fields and Webb 1997).

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[628] See chapter 2 for a general discussion of the bankruptcy problem and chapter 3 for a discussion of the topic in the banking habitat.

[629] Mikkelson (1981) provides an empirical examination of the determinants of firms' convertible bond issues. Fields and Webb (1997) look at the valuation effects of the announcements of banks' (adjustable-rate) preferred stock issues. They found those effects to be positive and significant. The finding might be interpreted as the positive reaction of banks' common shareholders to a relatively low-cost way of complying with regulatory primary capital requirements avoiding the dilution of common equity voting rights.

Question 18 queried the CEOs about their views on the main motives for banks to issue convertible securities. Table 5.18-A presents the relative frequencies of the (multiple) selection of items of surveyed CEOs.

Table 5.18-A

Motives for Banks to Issue Convertible Securities[a]

[unit: percent]

The expectation of a successful placement of the issue in the market	8.5
The expectation of a stock price increase	13.2
To avoid lowering managerial control	8.5
To avoid the dilution of shareholder's ownership	24.5
To avoid the dilution of managerial ownership holdings	5.7
To lower financing costs	28.3
Not applicable	6.6
Not sure / no opinion / Prefer not to answer	2.8
Other	1.9

[a] In this question multiple response was allowed. A total of 105 responses were registered. Percentages are based upon those 105 responses. Percentages may not add up to 100 percent due to rounding.

Selections of our survey respondents reveal ambivalent opinions about motives for issuing convertible securities. We therefore interpret the evidence as suggesting that Portuguese banks make these security offerings for a variety of purposes. In 38.7 percent[630] of the CEOs' responses, agency problems between shareholders and managers, and between existing and future shareholders, were cited as the determining factor, followed by lower financing costs (28.3 percent). The evidence suggests that expectations of a run-up in share price costs play a minor role in the issue of convertibles (13.2 percent). The only consideration that was indicated under the '*other*' category was taxation. This overall pattern of results did not change significantly when the sample was partitioned by CEOs of state-owned and privately-owned banks, as set forth in Table 5.18-B.

[630] This percentage results from adding the relative frequencies of "to avoid lowering managerial control" to "to avoid the dilution of shareholder's ownership" and "to avoid the dilution of managerial ownership holdings" categories.

Table 5.18-B
Motives for banks to Issue Convertible Securities

[unit: percent]

	Responses of CEOs of:	
	State-owned banks [a]	Privately-owned banks [b]
The expectation of a successful placement of the issue in the market	18,5	5.1
The expectation of a stock price increase	3,7	16.5*
To avoid lowering managerial control	0,0	11.4*
To avoid the dilution of shareholder's ownership	18,5	26.6
To avoid the dilution of managerial ownership holdings	7,4	5.1
To lower financing costs	18,5	31.6*
Not applicable	18,5	0.0**
Not sure / no opinion	0,0	0.0
Prefer not to answer	3,7	2.5
Other	11,1	1.3

[a] In this question multiple response was allowed. A total of 27 responses were registered. Percentages are based upon those 106 responses. Percentages may not add up to 100 percent due to rounding.
[b] In this question multiple response was allowed. A total of 79 responses were registered. Percentages are based upon those 106 responses. Percentages may not add up to 100 percent due to rounding.
† Significant difference at the 5 percent level for one-sided tests. †† Significant difference at the 1 percent level for one-sided tests.
* Significant difference at the 5 percent level for two-sided tests. ** Significant difference at the 1 percent level for two-sided tests.

When survey respondents were divided into state-owned and privately-owned banks, the most that could be said was that the role of convertible securities is viewed differently. State-owned respondents identified security marketability, managerial control, and bank valuation as important considerations. Privately-owned respondents identified the same motives but assigned significantly different priorities to them. Additionally, privately-owned banks' CEOs seemed most cost conscious than their counterparts at state-owned banks. A Fisher (exact) test reveals that the expectation of a rise in stock price as well as the concern with a decline in managerial control and the reduction in financing costs, are statistically significant different responses from the CEOs of state-owned and privately-owned banks. Although 18.5 percent and 26.6 percent of their answers indicated that avoiding the dilution of shareholder's ownership is a motive to issue convertible securities, this result is not significant at the 5 percent level. It should be also noted that these two groups of CEOs both appear to be less concerned with lowering managerial ownership holdings rather than doing so with shareholders'. No dramatic changes appear

when the sample is regrouped by CEOs of listed and unlisted, de novo and established, and over- and under-capitalized banks, either.[631]

External Financing Signaling Effects. As discussed earlier, when the information about a diffusely owned firm's actual and future performance is unevenly distributed among insiders and outsiders, the severity of informational asymmetries, ceteris paribus, is contingent on the level of separation between ownership and control (see Chapters 2 and 3). In these instances, bank management might use the occasion of a new debt or equity financing decision to send signals (new information) to capital market suppliers. Existing signaling theories in corporate financing (Ross 1977 and Leland and Pyle 1977), which were discussed in Chapters 2 and 3, describe and explain how a firm in need of external funding might signal its true characteristics to capital markets participants. These actions aim to preclude either an excessive cost of capital (the deadweight costs of asymmetric information) or a low demand for the firm's securities. These actions might be required whenever insiders know more than outsiders about the firm's true characteristics in terms of actual performance and future prospects.[632] Questions 19.1 and 19.2 in our questionnaire were designed to test of the classical signaling theory of Ross (1977).[633] The empirical evidence is presented in Tables 5.19.1 and 5.19.2.

Table 5.19.1
Signaling Effects of Future Debt Issue Announcement

	Mean score	Percent
Degree of agreement	4.6	82.4
Not sure / no opinion		17.6
Prefer not to answer		0.0

The 4.6 average score from survey participants on this question reveals apparent agreement with the hypothesis that debt issues are a vehicle for bank insiders to convey their favorable expectations about future performance, and something that should be

[631] Because multi-selection was allowed in this question, CEOs that indicated more items have more weight in the sample data. This may introduce some distortion in the analysis and therefore caution should be used in interpreting the results.
[632] As previously discussed in Chapters 2 and 3, for the disclosure of privileged information to be perceived as a credible signal by outside investors it must be costly to the signaler in order to avoid low quality firms to mimic the behavior of high quality firms. An illustration of the argument is provided by the case of a firm with poor prospects issuing additional debt. In these instances, because increased leverage should raise the firm's probability of bankruptcy (presumably a costly event to insiders), a signaling equilibrium among firms with differentiated prospects would arise in the market.
[633] See both Chapters 2 and 3 for an account of the signaling literature.

perceived as *good news* by outside investors. The rationale for this signaling argument is deeply rooted in managerial risk aversion as discussed in Chapters 2 and 3.

Table 5.19.2
Signaling Effects of Future Common Stock Issue Announcement

	Mean score	Percent
Degree of agreement	1,8	94.1
Not sure / no opinion		5.9
Prefer not to answer		0.0

CEOs in our sample do not agree (1.8 average score) that the announcement of a future stock issue is a way for managers to signal the capital markets their unfavorable expectations about future performance. Sixty percent of the respondents show their total disagreement (assigning a score of "1" in their responses) and seventy eight percent show a strong disagreement (scoring "1" and "2"). A 95 percent confidence interval for the proportion of CEOs suggest that we should expect that at least 66.5 percent of the population strongly ("1" and "2") disagree with the statement.

To measure the association between the responses to questions 19.2 and 27.1 we computed the Spearman's rank-order correlation coefficient (corrected for ties). We found a negative correlation of 0.435, which is statistically different from zero at the 1 percent significance level.[634] The degree of association between the two variables shows the expected sign, since CEOs who strongly disagree that a new stock issue conveys *bad news* to investors are likely to believe in a positive reaction on stock price after the announcement of a new stock issue.

As discussed earlier, Ross's model requires the firm to be diffusely owned. Therefore, whenever this condition is violated, Ross's results do not obtain. In contrast, Leland and Pyle's signaling theory[635] specifies a concentrated ownership structure with a block shareholder in control — *the entrepreneur*. Thus, the evidence provided in this question is consistent with Leland and Pyle's signaling argument, which predicts (similarly

[634] Since we had a prior expectation of a negative correlation we performed a one-tailed test.
[635] In Leland and Pyle's (1977) signaling theory, a budgetarily constrained entrepreneur needs external financing to undertake a profitable investment project (firm) whose profitability and risk characteristics capital market participants cannot verify. Because investors are unable to discriminate good from bad projects, they are likely to either require an expected return for their funds commensurate with the average quality of the projects in the market (consequently underpricing good projects) or refuse to participate in the market tout court (see Chapters 2 and 3 for further discussion).

to Jensen and Meckling 1976) that managerial ownership holdings are positively related to the firm's market value.[636] Therefore, stock price should not decline on the announcement of a new equity offering according to our surveyed CEOs.[637] These results are consistent with the observation that, as indicated earlier, rights offers were the prevailing form of raising new equity capital by Portuguese banks during the period 1989-1998.

Signaling with Differentiated Debt Financing Offerings. In a world of severe asymmetric informational problems capital market participants find it difficult to assess the true risk characteristics of issuers, and therefore to price securities at their fair value. In these instances, a CEO of a financially sound bank might refrain from issuing bonds in order to distinguish his bank from financially debilitated banks that have resorted to this type of financing. Question 20 is directed at learning whether CEOs might have refrained from deciding to issue a particular kind of debt security to signal investors their banks financial condition.

Table 5.20
Signaling with Differentiated Debt Financing Offerings

	Mean score	Percent
Degree of possibility	1.7	84.3
Not sure / no opinion		7.8
Prefer not to answer		7.8

In our survey, however, a large majority of CEOs also indicated that they were unlikely to avoid issuing the same type of debt securities issued by financially debilitated banks. One explanation might be that bond ratings help investors discriminate good quality banks from bad quality banks, thereby assuring good quality banks of fairly priced new debt offerings. This argument is consistent with the importance CEOs assigned to bond ratings in question 2 (see Tables 6.2.1, 6.2.2 and 6.2.3).

Influence of Underinvestment on Capital Structure. Question 21 asked CEOs about their most likely action in case they had an attractive investment opportunity but were unable to fund it internally. Myers (1977) showed that adverse selection costs associated

[636] As noted in chapter 3, Besanko and Kanatas (1996) hypothesize a relationship between managerial stockholdings and voluntary and involuntary security offerings by banks.
[637] Roth and Saporoschenko (1999) provide evidence in support of Leland and Pyle's (1977) prediction that stock prices react positively to large insiders' stock purchases.

with asymmetric information problems could lead managers to forego such profitable projects.

Table 5.21-A

The Underinvestment Effect on Banks' Capital Structure[a]

[unit: percent]

Change the bank's typical capital structure or traditional financing policy	58.6
Sell assets	19.0
Pass on the growth / investment opportunity	8.6
Reduce dividend payout	8.6
Not sure / no opinion / Prefer not to answer	5.1

[a] In this question multiple response was allowed. A total of 58 responses were registered. Percentages are based upon those 58 responses. Percentages may not add up to 100 percent due to rounding.

Results on this question were analyzed jointly with question 12, which deals with the influence of growth opportunities on new security issuance decision. As we reported then, we found moderate support for the underinvestment hypothesis.

Overall, only 8.6 percent of CEOs' responses indicated foregoing attractive new investment opportunities as a preferred choice.[638] The majority of the CEOs responses (67.2 percent) favored to deviate from the typical financing and dividend policies. Selling assets received 19 percent of the responses.

To further examine the Myers' underinvestment problem we partitioned our sample by CEOs of over and under capitalized banks (see Table 5.21-B).

Table 5.21-B

The Underinvestment Effect on Banks' Capital Structure

[unit: percent]

	CEOs of:	
	Over Capitalized banks	Under Capitalized banks
Change the bank's typical capital structure or traditional financing policy	61.3	55.6
Sell assets	19.4	18.5
Pass on the growth / investment opportunity	6.5	11.1
Reduce dividend payout	6.5	11.1
Not sure / no opinion / Prefer not to answer	6.4	3.7

Only 11.1 percent of the CEOs of under capitalized banks indicated that they would prefer foregoing attractive investment opportunities rather than deviating from the bank's usual financing policy. This compares to 6.5 percent of CEOs of over capitalized banks.

[638] Kamath (1997) reports that in his survey of Chief Financial Officers of NYSE-listed firms, excluding the FORTUNE 500 firms and financial intermediaries, 20 percent admitted to underinvest while almost no one mention the possibility of resorting to dividends cuts.

However, a significant majority of 67.8 percent (*p*-value: 0.0030) of this latter group admitted deviating from their bank financing and dividend policies in the event of a profitable investment opportunity. A similar percentage (66.1 percent) is reported for the CEOs of under capitalized banks. Selling assets was the following favored option, almost on evenly by both groups of CEOs. Interestingly, CEOs of over capitalized seemed more reluctant in reducing dividend payouts than their counterparts. One possible explanation for this finding might be related to the signaling effects of dividend policy.[639] These findings suggest that when adverse selection costs are present managers may underinvest.

Influence of Reputation on Capital Structure. In banking literature, reputation is hypothesized as a relevant factor for capital structure decisions. Question 22 queried CEOs how they perceive the influence of incentives provided by for capital structure decision-making — *reputation hypothesis*. Different arguments support the notion that there is a relationship between a bank's capital structure and its reputation in credit and deposit markets. In line with Titman's (1984) theory, we assume that the preponderance of a bank's borrowers and depositors have positive expectations about the viability of the bank. Increasing the bank's financial leverage could raise the probability of financial distress in the eyes of financial markets, thus eroding its reputation and hence causing harmful effects on the bank's reputation in the markets for loans and deposits.[640] Question 22 asks about CEO beliefs towards reputation and degree of financial leverage.

Table 5.22
Influence of a Bank Reputation on its Capital Structure Decisions

	[unit: percent]
Is an incentive for increasing financial leverage	23.5
Is an incentive for decreasing financial leverage	21.6
No impact on capital structure	19.6
Not sure / no opinion / Prefer not to answer	13.7
Other	21.6

The evidence provided by survey participants does not allow an unambiguous examination of the hypothesized relationship between a bank's reputation and its capital structure decision-making. More than 35 percent of the respondents provided valid answers

[639] See, e.g., Miller and Rock (1985).
[640] In extremely damaged reputation states we might see bank runs developing.

and 21.6 percent indicated their own suggestions under the 'Other' category. We conclude that if reputational effects do exist, they might be trivial.

Security Private Placements. The next two questions queried CEOs beliefs about private placements of securities. Table 5.23.1 addresses debt private placements and Table 5.23.2 equity private placements.[641]

Table 5.23.1
Private Placement of Debt Issues

Degree of agreement	5.4	68.0
Not applicable		32.0
Not sure / no opinion / Prefer not to answer		0.0

Overall, 68 percent of survey respondents show a high degree of concordance (mean score of 5.4) in undertaking private placements of debt issues.

Table 5.23.2
Private Placement of Stock Issues

	Mean score	Percent
Degree of agreement	4.0	44.1
Not applicable		47.1
Not sure / no opinion		0.0
Prefer not to answer		8.8

Table 5.23.2 shows that slightly more than 44 percent of the CEOs of unlisted banks would be favorably disposed towards the private placement of equity (mean score of 4.0).

It is widely believed that the typical anonymity prevailing in public security markets creates the real possibility that investors' transactions may be made in informationally disadvantageous terms. Privately placed debt and equity securities might allow investors to gain access to privileged information and, therefore, make better-informed investment decisions.[642] In this situation, the rate of return required by investors would be minimized implying the minimization or elimination of the deadweight costs of asymmetric information.[643] As suggested by a number of authors (e.g., Jensen and

[641] In Portugal, at least, private placements of equity are only allowed to privately-held firms.
[642] Under the Portuguese legal framework private placements of stock offerings are only allowed to non-listed firms.
[643] As shown by Diamond and Verrecchia (1991) disclosing information to alleviate the informational gap can reduce a firm's cost of capital by inducing increased demand from large investors. Security market *watchdogs* typically require security private placements to involve a small number of large and well-informed investors (e.g., Grinblatt and Titman 1998; Brealey and Myers 1996).

Meckling 1976), because private placements permit more (and presumably, better) sharing of private information with investors, they might help to lower the agency costs of debt contracts by the incorporation of less stringent convenants. Since private placements are believed to be an effective means of lowering both asymmetric information and agency costs,[644] we may expect that private placements would be recurrently used to promote information flows without releasing sensitive information publicly. Questions 23.1 and 23.2, question 24, and question 29 aim at testing hypotheses related to these issues.

Private Placements and Information Sharing. Question 24 tests the hypothesis that private placements of securities facilitate the sharing of sensitive private information with selected investors without disclosing that information publicly. Campbell (1979), argued that firms with valuable private information about their products, processes and technologies, which would be costly to reveal to the market, might finance privately to avoid disclosing such privileged information to competitors. Table 5.24 explores that question with survey participants.

Table 5.24
Private Placements as a Means of Sharing Privileged Information

	Mean score	Percent
Degree of agreement	4.3	82.0
Not sure / no opinion		10.0
Prefer not to answer		8.0

A large majority (82 percent) of the bank CEOs indicate some agreement with the hypothesis (mean score of 4.3). However, we found a wide variability (standard deviation: 1.8) in the responses given by surveyed CEOs. Almost an identical score (4.4) is observed for CEOs running privately-owned banks (4.4). These empirical findings suggest that costs associated with asymmetric information problems in banks' new security offerings might not be as severe as usually hypothesized for non-banking firms.

Question 25 focuses on the pricing of Portuguese banks' private placements compared to their public offerings. Although there is an information advantage for private placements compared to public offerings, conventional wisdom also suggests that because of higher liquidity risk, privately placed debt carries a higher interest rate and privately

[644] Among others, Myers and Majluf (1984), Campbell and Kracaw (1980), Campbell (1979), and Donaldson (1965).

placed equity is sold at lower prices when compared to similar public issues. CEOs in our survey were queried about the cost of capital implications of going the private placement route versus a public offering alternative.

Table 5.25.
Comparison of Prices and Returns of Bank Private Placements and Public Offerings

	Mean score	Percent
Issue price	3.0	
Investors returns	4.2	
Not applicable		35.3
Not sure / no opinion / Prefer not to answer		13.7

Responses indicate that issue prices (therefore capital cost) tend to be marginally lower in private placements (mean score of 3.0). However, investors seems to be better off with private placements than with public offerings (mean score of 4.2) for reasons discussed earlier. It should be noted that more than one-third of the respondents indicated that their banks were not involved in either private or public financing during their tenures as CEOs.

Covenants and Debt Offerings Marketability. Debt issuers might be willing to accept the inclusion of restrictive covenants in an attempt to improve the risk and marketability of debt security offerings in exchange for a lower cost of funds (e.g. Jensen and Meckling 1976). Question 26 tests this hypothesis. The inclusion of covenants in debt contracts is a helpful mechanism that lenders can use to reduce some forms of the agency costs of debt. Here, CEOs are asked to indicate their degree of agreement (disagreement) with the inclusion of covenants in banks debt-financing contracts as a means of enhancing the marketability (and lowering the costs) of such debt offerings.

Table 5.26.
Inclusion of Covenants in Debt Contracts

	Mean score	Percent
Degree of agreement	3.3	90.2
Not sure / no opinion / Prefer not to answer		9.8

More than 90 percent of the CEOs gave usable answers, and the results indicate that the inclusion of covenants in bank debt contracts as a means to increase issue marketability is not viewed as important by the CEOs (mean score of 3.3). This suggests that either they perceive agency costs of debt as low or they can find more efficient ways to deal with the problem.

Overvaluation Hypothesis. In banking, as recognized by Besanko and Kanatas (1996), and Cornett and Tehranian (1994) among others, the presence of mandatory capital standards requires a reexamination of Myers and Majluf's overvaluation hypothesis.[645] Since *involuntary* stock issues aim at complying with regulatory capital standards, they do not convey much new private information to capital market participants, and consequently they would not be expected to depress the stock price as much. By contrast, the Myers and Majluf model would suggest that *voluntary* stock issues should be interpreted by external investors as a sign that the shares are overvalued at the prevailing market price. This would in all likelihood cause a subsequent decline in share price.[646] As hypothesized by Myers and Majluf (1984), (better informed) insiders generally issue securities when and if they believe the firm is overvalued.[647] This layout implies a diffuse ownership structure with separation of management and control functions. When ownership rights are not separated from management control functions, then the presumption that insiders have an informational superiority over outsiders clearly does not hold, and the Myers and Majluf overvaluation effect would not prevail. If all investors were equally informed, any signaling activity would be a unnecessary waste of money. Questions 27.1 and 27.2 were designed to test Myers' *overvaluation hypothesis*. Table 5.27.1 reports CEOs' views on the stock price reaction to announcements of their banks' voluntary equity issues. Table 5.27.2 reports the same evidence for the stock price reaction to announcements of banks' straight debt offerings.

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[645] Besanko and Kanatas (1996, 173) argue that "the result that the equity issued to comply with a capital standard reduces the price of the bank's stock is reminiscent of the Myers and Majluf (1984) result that external financing for firms is costly."

[646] A different result for involuntary stock issues may be obtainable on the grounds of the agency problem emphasized by Jensen and Meckling's (1976). In the presence of managerial self-interested behavior in respect to level of effort overspending on non-pecuniary benefits, insiders do not maximize shareholders wealth. In this view, issuing additional equity to comply with regulatory capital adequacy standards might exacerbate moral hazard problems of effort-aversion and excessive private consumption of bank's resources, resulting in reduction of the bank's stock price.

[647] In Myers and Majluf's (1984) signaling model managers are assumed as maximizing (existing) shareholders' wealth.

Table 5.27.1
Stock Price Reaction to Announcements of Bank (Voluntary) Equity Issues

	Mean score	Percent
Magnitude of reaction	3.5	62.7
No change		0.0
Not sure / no opinion / Prefer not to answer		37.3

Almost two thirds (62.7 percent) of the CEOs provided a valid answer to the question about the impact on a bank's share price of the announcement of a (voluntary) stock issue. On a scale of 1 to 6 the mean score of 3.5 indicates a point of indifference (standard deviation: 0.88). The evidence seems to suggest that CEOs perceive stock price reactions to announcements of (voluntary) equity issues as negligible.[648] Given the idiosyncrasies of Portuguese banks' ownership structures and their recurrent use of rights offers to raise new equity capital, the result is fairly consistent with what the theory would predict.

Table 5.27.2
Stock Price Reaction to Announcements of Bank (Straight) Debt Offerings

	Mean score	Percent
Magnitude of reaction	3.0	29.4
No change		41.2
Not sure / no opinion / Prefer not to answer		29.4

Forty one point two percent of the surveyed CEOs indicated that they expected no change in stock price after the announcement a new debt issue and 29.4 percent were unsure, willing or had no opinion. The remaining 29.4 percent envisioned, on average, a slight decline (mean score of 3.0) in the same event. The responses of this last group of CEOs vary between 2 and 4 (standard deviation: 0.53) revealing a high level of consonance. These results are viewed as essentially suggesting no negative stock price reaction on the announcements of bank (straight) debt offerings.

Overall, the results from Tables 5.27.1 and 5.27.2 are not significantly different from previous empirical findings. Thus, taking into consideration the context of the survey

[648] This evidence is viewed as consistent with Tsangarakis (1996) who report (statistically significant) positive abnormal stock returns on the announcement day of rights offerings in Greece, and its inverse relation with stock ownership diffusioness. These findings suggest that rights offerings in the Greek environment convey positive information about future prospects of issuers.

and the results of the statistical test already reported (see question 19.2), we interpret the evidence as consistent with the signaling theory literature.

Motives for Issuing Callable Debt Securities. Financial theory suggests that debt security offerings with call features attached may be beneficial for issuers. Among the arguments offered in the literature to substantiate such proposition, the uncertainty of future interest rates is a popular one.[649] Thereby, the use of callable bonds in a firm's financing structure can be justified as helping to mitigate agency costs and information asymmetries (e.g., Barnea, Haugen, and Senbet 1981). According to conventional wisdom those call features allow the issuing firm to take advantage of a future decline in interest rates.[650] Question 28 looks at this issue. Results are presented in Table 5.28.

Table 5.28
Callable Bonds and the Term Structure of Interest Rates

	Mean score	Percent
Degree of agreement	5.2	88.2
Not sure / no opinion / Prefer not to answer		11.8

Almost 90 percent of surveyed CEOs declared strong agreement (mean score of 5.2) with the idea of issuing callable bonds to try to take advantage of favorable developments in the term structure of interest rates. In view of this unanimity, no statistical test was conducted on this data.

As discussed earlier, private placements are helpful in lessening the deadweight agency and informational costs arising in financial contractual relationships between management and outside investors. A similar effect is acknowledged in the literature.

Information Sharing in Private versus Public Security Offerings. Question 29 queries CEOs about the extent to which they agree that private placements allow the inclusion of less severe restrictive covenants than for public debt offerings due, at least in part, to a greater sharing of privileged information with investors. This implied reduction in informational asymmetries is likely to induce management to lower its propensity for

[649] Additional considerations that might induce firms to issue callable debt are: (1) reduction in agency problems associated with information asymmetries between borrowers and lenders; (2) differential risk preferences of equityholders and debtholders; (3) managerial signaling; (4) differential tax rates between the borrower and the financier; (5) debt maturity preferences; and (6) the opportunity to remove an undesirable protective covenant in the bond indenture.

moral hazard behavior and therefore to contribute to the decrease of the agency costs of debt.[651]

Table 5.29
Covenants in Private versus Public Security Offerings

	Mean score	Percent
Degree of agreement	4.3	88.2
Not sure / no opinion / Prefer not to answer		11.8

The evidence provided by CEOs on this question suggests that, in banking, such costs may not be trivial although they may be less severe that would be the case in non-banking environments.

Issuing Costs and Financing Policy. Adjusting a firm's capital structure is costly because financial contracting to raise debt and equity capital involves significant direct out-of-pocket expenses.[652] Simultaneously, it is also a source of benefits associated with the minimization of the cost of capital. Thus, we would expect that a bank's manager would compare the transaction costs involved in capital structure adjustments against the advantages of moving closer to the optimal capital structure. As observed by Grinblatt and Titman (1998), among others, there are economies of scale in securities issuing. The conventional wisdom suggests that, on average, Portuguese banks enjoy issuing cost advantages over non-banking Portuguese firms. Question 30 asks survey participants about the impact of such cost considerations on their issuing policies. Results are presented in Table 5.30.

Table 5.30
Effect of Issuing Costs on the Bank Financing Policy

	[unit: percent]
More frequent and bigger issues	2.0
More frequent and smaller issues	9.8
Less frequent and bigger issues	31.4
Less frequent and smaller issues	0.0
No influence	45.1
Not sure / no opinion / Prefer not to answer	11.8

[650] Other reasons for the use of call provisions in bond indentures include the ability to achieve the necessary flexibility to restructure its financing structure in the future. Additionally, the possibility of replacing bonds with burdensome convenants with less restrictive indentures.
[651] See Chapters 2 and 3 for a discussion of the underlying arguments.
[652] Lee *et al*. (1996, 16) report that in the U.S. during the 1990-1994 period average total direct costs (as a percentage of gross proceeds) of equity offerings was 11 percent for IPOs, and 7.11 percent for SEOs. 3.79 percent for convertible bonds, and 2.24 percent for straight bonds.

Forty-five percent of surveyed Portuguese bank CEOs deemed issuing costs as inconsequential. A smaller percentage (31.4 percent), however, indicated that security-issuing costs would require less frequent "trips" to financial markets and larger scale security offerings. We hypothesize that banks are likely to enjoy scale cost advantages in security issuing. To investigate this hypothesis we estimated a logistic regression model in which we specified the responses "Less frequent and bigger issues" as dependent (binary) variable and bank size as independent variable. The regression results did not provide evidence in support of the hypothesis.

The Disciplinary Role of Short-Term Debt Financing. It is widely accept in the literature that the severity of equityholder-debtholder conflicts of interest is lower when firms use shorter- rather than longer-term debt maturity financing on their balance sheets (e.g., Grinblatt and Titman 1998, 568).[653] Arguably, shorter-term debt gives fewer incentives for owners to attempt to benefit from risk shifting, claim dilution and asset substitution. A possible explanation for the argument (as discussed in chapter 3) is provided by Flannery (1994, 1986) and Diamond (1991). These authors suggest that rights assigned to financiers in debt contract renewal, exposes debtors to increased liquidity risk[654] and curtails their incentives for behaving opportunistically. Thereby, short-term debt has a disciplinary effect in curbing managerial discretion. It may be argued then, that the interest of outside investors (either equityholders or debtholders) is served in having a bank carry some short-term debt in its capital structure. Question 31 provides a test to the hypothesis. Table 5.31 presents the results.

Table 5.31
Relevance of Short-Term Debt for Bank Decisions on Capital Structure

	[unit: percent]
Totally irrelevant	9.8
Largely irrelevant	17.6
Somewhat irrelevant	15.7
Somewhat relevant	39.2
Largely relevant	11.8
Totally relevant	3.9
Not sure / no opinion / Prefer not to answer	2.0

[653] Guedes and Opler (1996), Barclay and Smith (1995) and Myers (1977), among others, argue that longer-maturity debt financing is more subject to equityholder-debtholder conflicts.
[654] Risk implicit in the unpredictability about the renewing of outstanding short-term debt.

Results of this question are somewhat mixed and do not allow us to draw any statistically significant conclusions from them.

Term Structure of Interest Rates and Capital Structure. As explained earlier, *riding the yield curve* is a frequent 'strategy' for lowering financing costs and is abundantly described in standard finance textbooks (e.g. Grinblatt and Titman 1998, 352-358). Question 32 examines the relevance of the term structure of interest rates to banks' capital structure decisions. To illustrate, when the yield curve is upward sloping, banks are likely to be willing to rely more aggressively on short-term liabilities than on long-term maturity debt. However, when expectations are reversed and rising interest rates is a likely scenario, a bank may try to "lock in" low rates by issuing long-term maturity debt.

Table 5.32
Relevance of Term Structure of Interest Rates for Bank Decisions of Capital Structure

	[unit: percent]
Totally irrelevant	0,0
Largely irrelevant	7,8
Somewhat irrelevant	3,9
Somewhat relevant	33,3
Largely relevant	51,0
Totally relevant	2,0
Not sure / no opinion / Prefer not to answer	2,0

A percentage of 86.3 of surveyed CEOs indicated that attempting to take advantage of the dynamics of the term structure of the interest rates was important. A *Z*-test of a proportion shows, at any reasonable level of significance (p-value < 0.0001) that we should expect the majority banks' CEOs to exhibit this kind of behavior. Thus, the evidence provides support to our hypothesis.

Targeting Security Offerings. Targeting specific investors segments in the design and marketing of security offerings is well-known fact in financing decision-making (e.g., Chen and Kim 1980; Kim, Lewellen, McConnell 1979; and Miller 1977). The Motives of this targeting are associated with lowering agency and information costs and/or increasing the marketability of an issue. In this view, firms choosing a financing strategy might design security offerings to attract targeted *segments* of investors with the goal of lowering financing costs. Question 33 is an attempt to test the *targeting argument*.

Table 5.33
Motives for Targeting New Security Issues and Capital Structure Decisions

	[unit: percent]
Impact on the yield required by investors	33.3
Required level of private information disclosure	17.3
Impact on issue's price	14.7
Impact of issuing costs	18.7
Not sure / no opinion / Prefer not to answer	12.0
Other	4.0

The responses of survey participants indicate that lower financing cost was the more important reason for designing a security offering targeting a specific investors group. To test the hypothesis that overcapitalized banks might be willing to target their security offerings to specific segments of investors in order to lower their required rates of return by increasing the sharing of information we conducted a logit regression. We specified the responses "Required level of private information disclosure" as dependent variable and the capital ratio during the CEO tenure as explicative variable. Regression coefficients failed to show statistical significance.

Intangible Assets and Capital Ratio. Our final question sought the relationship between changes in a bank's intangible asset-base and its capital ratio. As suggested by Myers (1984), the greater the proportion of tangible assets a firm has, the greater it can rely on debt. The implication of this argument is that it is risky to heavily rely on debt financing for intangible assets, such as front-end growth expenses, research and development projects, or advertising campaigns, which can hardly be collateralized. Because of financial distress, firms that are more dependent on intangible assets should, ceteris paribus, use relatively more equity and less debt. Question 34 asks CEOs to indicate how a bank's capital ratio would be affected if it were to become more dependent on intangible assets for its success. The empirical findings of Long and Malitz (1985) provide support for Myers' hypothesis that a firm's financial leverage is inversely related to its intangible asset expenditures, since those are positively associated with new growth opportunities. CEOs were queried about the presence, direction, and magnitude of any relation between the size of a firm's intangible asset base and its capital ratio. Results are presented in Table 5.34.

Table 5.34
A Bank's Intangible Asset-Base and its Capital Ratio

	Average Score	Percent
Degree of increasing variation	4.4	21,6
Degree of decreasing variation	2.8	37,3
Unchanged		11,8
Not sure / no opinion / Prefer not to answer		29.4

A considerable number of CEOs (29.4 percent) were unsure, unable or unwilling to answer this question. A total of 70.6 percent of the survey participants did express their views, although 11.8 percent said the capital ratio would remain unchanged. From those CEOs that acknowledged the existence of such a link, 35.5 percent indicate a (somewhat) positive relation (mean score of 4.2 in a scale 1 to 6) and 64.5 percent a (somewhat) inverse relation (mean score of 2.9 in a scale 1 to 6). These results seem to contradict the theory. Because of the poor collateralization attributes of intangible assets, a more relative intensive use of such type of assets, *ceteris paribus*, would likely determine a less intensive use of debt financing and therefore a higher capital ratio. To test the statistical significance of these results we performed a *Z*-test of a proportion to the responses that indicated the presence of the hypothesized relationship. At a 5 percent confidence level (*p*-value: 0.912) we fail to reject the null hypothesis.

In attempting to explain this empirical evidence, we call the attention to the fact that fixed — tangible and intangible — assets are relatively small in the Portuguese banking industry (and presumably elsewhere) and therefore the potential effect of intensifying the use of intangible assets, if any, might be negligible. Additionally, we may conjecture that this relation might be idiosyncratic, and therefore elusive to be captured as an empirical regularity.■

Appendix 5.1

Questionnaire Theoretical Validity

Question		Hypotheses
1.1.	Different measures are commonly used to gauge the intensity of capital use in a bank financing structure. During your time as CEO which of the following did you choose?	Regulatory discipline. Capital market discipline.
1.2.	During your time as CEO which of the following external sources of funds were more frequently used?	Scale effect of security issue costs.
2.	During your time as CEO what importance did you assign to the following financial management objectives?	Firm value maximization. Shareholder wealth maximization. Financial slack. Managerial risk aversion. Discipline of debt markets.
3.	During your time as CEO, please identify the prevailing intention in the bank's strategic financing decision-making:	Trade-off capital structure. Optimal capital structure. Target capital structure. Pecking order. Neutral mutations.
3.2.	Please prioritize the long-term financing sources resorted to during your time as CEO in terms of their use:	Pecking order.
3.3.	Please specify the origin of the followed set of guidelines on financing policy:	
4.	During your time as CEO, which of the following external factors has had the most important impact on the bank's capital structure decisions?	Discipline of the market for corporate control. Discipline of product market. Capital market performance. Tax.
4.1.	During your time as CEO how relevant was the development of the Portuguese capital market for the bank's decisions on capital structure?	Capital market level of development.
4.2.	During your time as CEO how important was the existence of a 10% limit on share repurchases, as it exists under current Portuguese law, for the bank's decisions on capital structure?	Free cash flow. Underpricing.
5.	During your time as CEO which of the following internal factors has had the most important impact on bank's decisions on capital structure?	Governance. Non-debt tax shields. Free cash flow.
5.1.	When free cash flow was large which of the following capital structure decisions was made?	Free cash flow.
5.2.	When free cash flow was large and new debt was issue, how would you describe the bank's ownership structure?	Free cash flow.
5.3.	When free cash flow was large and new debt was issue, and the ownership structure was diffuse, with no major shareholder(s) and limited managerial ownership, with which of the following scenarios was most likely associated?	Managerial level of effort. Non-debt tax shields. Growth opportunity set. Corporate tax. Security mispricing. Size. Shareholder-debtholder incentive conflicts. Investors' taxation. Trade-off. Signaling. Reputation.
6.	An increase in financial leverage is likely to influence investment policy. If so, in which way?	
7.	Financial distress is likely to impact upon investment policy. If so, in which way?	
8.	During the time span you are referring to, how do you characterize the bank's pattern of debt issuance?	Claim dilution
9.1.	During your time as CEO how do you assess the impact of changes in the following types of taxation on capital structure decisions?	Tax.
9.2.	During your tenure how do you assess the impact of differences in taxation on retained earnings, dividends, interests and capital gains on bank's capital structure decisions?	Taxation at personal level
9.3.	During your time as CEO how do you evaluate the role of tax economies inherent to sources other than the costs of debt financing sources (like depreciation and / or loan loss provisions), on bank's capital structure decisions?	Non-debt tax shields.
9.4.	How could you have agreed issuing more stock, rather than debt, if there had been tax allowances on dividend payouts?	Debt tax shield.
9.5.	How do you rate the likelihood of having issued less debt if have ceased the tax allowance on borrowing costs, as happened in USA with very long-term maturity debt issuances (more than 40 years)?	Debt tax shield.

9.6.	How do you assess the impact of tax-loss carryforwards on bank's capital structure decisions?	Tax-loss carryforwards.
9.6.1.	What kind of security is a bank with tax-loss carryforwards most likely to issue?	Tax-loss carryforwards.
10.1.	How did capital market conditions affect the timing of a new issue of common stock?	Capital market performance.
10.2.	How did capital market conditions affect the timing of a new issue of debt?	Capital market performance.
11.	How did the bank's stock price performance affect the timing of new security (whether common stock or debt) issues?	Timing.
12.	How did growth opportunities affect the decision of making a new security (whether common stock or debt) issue?	Growth opportunity set.
13.	During your time as CEO how would you rate the bank's average cost of capital in comparison to the industry average?	Cost of capital
14.	What reduction (in percentage points) in the average cost of capital would make you disclosing privileged information to the capital market incurring in the risk of revealing to competitors bank's plans or strategies (like, for example, a planned downsizing, or entry in a new venture)?	Deadweight costs of asymmetric information
15.	How would you evaluate the effects of financial distress (or bankruptcy) considering that, under Portuguese Law, banks have a specific set of procedures to handle these situations (Article No.139, No.2 Decree of Law No. 298/92, from December 31)?	Bankruptcy costs.
16.	How do you assess the impact of bank size — measured as the book value of total assets — upon the risk of bankruptcy?	Too-big-to-fail.
17.	Assuming a hypothetical bankruptcy what is your estimate of its costs — both direct (e.g., filing and lawyers' fees) and indirect (e.g., lost business, profits and relationships) — in proportion of the book value of the assets?	Bankruptcy costs.
18.	What are the main reasons for banks, in actual capital market conditions, to issue convertible bonds or preferred stock?	Governance Incentives.
19.1.	Would you agree that "the announcement of a long-term debt issue is a way for managers to signal to capital markets favorable expectations about the bank's future performance"?	Signaling.
19.2.	Would you agree that "the announcement of a future stock issue is a way for managers to signal capital markets unfavorable expectations about the bank's future performance"?	Signaling.
20.	Do you believe that the bank should have refrained from issuing bonds in order to distinguish itself from other financially debilitated banks that have resorted to this type of financing?	Signaling.
21.	What action would you consider when facing the following scenario: "a new growth / investment opportunity cannot be taken without changing the bank's typical capital structure or its traditional hierarchy of sources of financing"?	Underinvestment.
22.	Reputation of financial institutions in general, and banks in particular, is an important asset. How do you describe its influence on capital structure decisions?	Reputation.
23.1	During your time as CEO the bank may have made private offerings (private placements) of debt issues. How did you agree with that practice?	Debt placement.
23.2	During your time as CEO the bank may have made private offerings (private placements) of stock issues. How did you agree with that practice?	Equity placement.
24.	Do you agree "private placements of securities might be an efficient way for a bank to share private information with investors without publicly disclosing privileged information"?	Information.
25.	How do you compare the prices and the returns of bank's private placements and public offerings?	Private placement signaling.
26.	Would agree that the inclusion of covenants in a bank's debt contracts if enhances the marketability of its debt issues?	Shareholder-debtholder .
27.1.	What impact upon a bank's share price would you typically expect following the announcement of a bank's (voluntary) stock issue?	Underpricing.
27.2	What impact upon a bank's share price would you typically expect following the announcement of a bank's debt issue?	Underpricing.
28.	Would you issue fixed rate bonds with a call option attached (callable bonds) aiming at profiting from an expected decrease in market interest rates?	Claim dilution
29.	Would you agree with the statement that "typically, private placements of securities allow for less stringent covenants than public offers due, at least in part, to the former being a more efficient means of sharing information with investors"?	Private placement signaling
30.	Issuing securities (whether stock or debt) is costly. How did these costs affect the bank's issuing policy?	Flotation costs.
31.	How important was short-term debt in the bank's decisions of capital structure?	Maturity structure.
32.	What is the relevance of the term structure of interest rates on bank's capital structure decisions?	Yield curve.

33.	Why would you favor a new security issue (whether stock or debt) designed for specific groups of investors, rather than an indiscriminate placement?	Clientele effect.
34.	What is your estimate for bank's capital ratio (Equity-to-Total Assets) in the scenario "of bank's intangible asset-base growth of its relative importance due to imperatives of the competitive strategy (e.g., distribution channels supported by information technology"?	Asset intangibility.

Appendix 5.2

Statistical Tests Conducted on Survey Data

Question		Statistical Test
1.1	Metrics of Bank Financial Leverage	Fischer (exact) test of independence.
1.2.	Sources of External Financing	Set of logistic regressions.
2	Bank Financial Management Objectives	Signed rank test for two expected values. One-sided Wilcoxon-Mann-Witney rank sum tests (of two independent samples).
3	Capital Structure Policy Models	No statistical test was conducted on this data.
4	External Determinants on Bank Capital Structure Decisions	Wilcoxon-Mann-Whitney tests.
4.1	Importance of Capital Market Development Capital Structure Decisions	One-sided Wilcoxon-Mann-Whitney tests of independence of mean scores
4.2	Share Repurchases Restrictions on Bank Capital Structure Decisions	Level of significance test.
5	Internal Determinants on Bank Capital Structure Decisions	Two-sided Wilcoxon-Mann-Whitney test (p-value: 0.0500).
6 and 7	Agency Problems	No statistical tests were conducted because of data.
7.1	Impact of Financial Leverage on Investment Policy.	No statistical tests were conducted because of data.
7.2	Influence of Financial Distress upon Investment Policy	No statistical tests were conducted because of data.
8.	Pattern of Debt Issuance	No statistical tests were conducted because of data.
9.1	Tax Effects on Capital Structure Decisions	Wilcoxon signed-ranks tests.
9.2	Taxation at personal level	No statistical tests were conducted because of data.
9.3	Non-debt tax shields	No statistical tests were conducted.
9.4	Debt tax shield	No statistical tests were conducted because of data.
9.5	Debt tax shield	A test for the equality of a percentage
9.6	Tax-loss carryforwards	A test for the equality of a percentage
110.1 and 10.2	Influence of Capital Markets on the Timing of New Securities Issues.	Chi-square statistic
11.	Influence of Stock Price Performance on the Timing of New Securities Issues.	Z-test of a proportion
12	Influence of Growth Opportunities on New Security Offerings.	(Exact) Fisher test of independence Difference between proportions
13	Bank's Average Cost of Capital versus Industry Average.	Wilcoxon signed-ranks test
14	Deadweight Costs of Asymmetric Information.	No statistical tests were conducted because of data.
15.	Bankruptcy Effects on Capital Structure Decisions.	Z-test of a proportion
16.	The too big too fail doctrine.	Z-test of a proportion.
17	Bankruptcy Costs.	No statistical tests were conducted because of data.
18	Motives for Issuing Convertible Securities.	A Fisher (exact) test
19.1 and 19.2.	External Financing Signaling Effects.	Confidence interval for a proportion. Spearman's rank-order correlation coefficient (corrected for ties) to measure association between responses to questions 19.2 and 27.1.
20	Signaling with Differentiated Debt Financing Offerings.	No statistical tests were conducted because of data.
21	Influence of Underinvestment on Capital Structure.	Results on this question were analyzed jointly with question 12. Level of significance of a proportion
22	Influence of Reputation on Capital Structure.	No statistical tests were conducted because of data.
23	Security Private Placements.	Z-test of a proportion. Standard deviation.
24	Private Placements and Information Sharing.	No statistical tests were conducted because of data.
25	Pricing of Private Placements Compared to Public Offerings.	Z-test of a proportion.

26	Covenants and Debt Offerings Marketability.	No statistical tests were conducted because of data.
27	Overvaluation Hypothesis	Tested jointly with question 19.2.
28	Motives for Issuing Callable Debt Securities.	No statistical tests were conducted because of data.
29	Information Sharing in Private versus Public Security Offerings	No statistical tests were conducted because of data.
30	Issuing Costs and Financing Policy	Logistic regressions
31	Disciplinary Role of Short-Term Debt Financing	No statistical tests were conducted because of data.
32	Structure of Interest Rates and Capital Structure	Z-test of a proportion.
33	Targeting Security Offerings	Logit regression.
34	Intangible Assets and Capital Ratio	Z-test of a proportion.

Appendix 5.3

Average Total Assets, Bank Capital and Industry Capital Ratios during CEOs Tenure

CEO Code[a]	Average Total Assets[b] [unit: 10^6 PTE]	Average Bank Capital Ratio[c]	Average Industry Capital Ratio[d]
1	1514367	0.0464	0.0693
2	3084525	0.0704	0.0693
3	829572	0.0429	0.0723
4	298172	0.0350	0.0639
5	524994	0.0527	0.0585
6	12141	0.3153	0.0482
7	290817	0.0738	0.0465
8	80648	0.0681	0.0440
9	783863	0.0476	0.0594
10	439028	0.0868	0.0444
11	619520	0.0587	0.0512
12	1271808	0.0610	0.0427
13	562918	0.0409	0.0427
14	1923500	0.0575	0.0594
15	2097225	0.0384	0.0446
16	157264	0.0702	0.0482
17	250571	0.0288	0.0482
18	17281	0.2750	0.0465
19	500253	0.0336	0.0723
20	546718	0.0623	0.0800
21	307227	0.0635	0.0440
22	1021643	0.0660	0.0554
23	557614	0.0416	0.0501
24	90939	0.1166	0.0482
25	708498	0.0359	0.0554
26	569637	0.0152	0.0465
27	16529	0.2875	0.0444
28	1135765	0.0580	0.0723
29	473584	0.0416	0.0524
30	29661	0.0945	0.0444
31	865538	0.0821	0.0800
32	495396	0.0552	0.0774
33	165792	0.1299	0.0723
34	1840135	0.0478	0.0506
35	52626	0.1573	0.0446
36	4653560	0.0573	0.0446
37	362583	0.1402	0.0800
38	853900	0.0371	0.0440
39	65257	0.1146	0.0465
40	52848	0.0567	0.0440
41	137648	0.0772	0.0549
42	672571	0.0469	0.0446
43	295263	0.0405	0.0482
44	82051	0.2137	0.0639
45	2553354	0.0272	0.0465
46	1933902	0.0409	0.0465
47	591900	0.0440	0.0440
48	126471	0.1494	0.0444
49	17077	0.0935	0.0440
50	103123	0.1147	0.0761
51	39184	0.2105	0.0823

[a] As anonimity and confidentiallity in individual responses was guaranteed to survey participants, we assigned a numerical code to each CEOs. Ordering of CEOs was randomized in this table.

Appendix 5.4

Response Rates of Mail-Surveys on Capital Structure

Study	Sample	Surveys mailed	Response Rate
Baker, Gallagher and Morgan (1981)	Two random samples of 150 stock repurchasing firms each, listed on the NYSE.[a]	150 150	48.7% 42.0%
Scott and Johnson (1982)	1979 Fortune 1000's.	1000	21.2%
Gitman & Mercurio (1982)	CFOs[b] of the 1980 Fortune 1000s.	1000	17.7%
Reichert and Moore (1984)	May 1980 Fortune 500 list.		
Scott and Petty II (1984)			
Baker, Farrelly and Edelman (1985)	CFOs of 562 firm's listed on the NYSE during 1983.	562	56.6%
Norton (1989)	1984 Fortune 500s firms.	500	21%[655]
Pinegar and Wilbricht (1989)	1986 Fortune 500s firms	500	35%
Pruitt & Gitman (1991)	CFOs 1987 500s firms plus second 500 largest firms drawn from Compustat industrial files.	1000	11.4%
Norton (1991a)	1984 Fortune 500s firms	500	21%
Norton (1991b)	CFOs of publicly held small firms.[656]	405	27.2%
Hittle, Haddad and Gitman (1992)	CFOs OTC[c] 500s firms.[657]	500	16%
Jog and Srivastava (1994)	CFOs TSE-300 Canadian firms and large foreign-owned and private firms operating in Canada (April 1991).	582	22.9%
Kester, Chang and Tsui (1994)	Executives of 123 listed on the Stock Exchange of Singapore (April 1990) Executives of 140 listed on the Stock Exchange of Singapore (November 1992) Executives of 246 listed on the Stock Exchange of Singapore (April 1992)	123 95 37	69.1% 46.4% 15.0%
Trahan and Gitman (1995)	Fortune 500 largest industrial companies and Forbes 200 best small companies.		
Kamath (1997)	CFOs NYSE (Dec 31, 1988) firms excluding Fortune 500's industrial firms of 1989 and all financial intermediaries	690	20.6%
Kester *et al.* (1997)	CEOs CFO's sample of firms listed on Australian Stock Exchange, Stock Exchange of Hong Kong, Kuala Lumpur Stock Exchange, Jakarta Stock Exchange, Philippine Stock Exchange, Stock Exchange of Singapore	1298	24,2%
Babu and Jain (1998)	Sample of 1300 companies selected on the basis of stratified random sampling from the official directory of the Bombay Stock Exchange	1300	7%
Jong and Dijk (1998)	CFOs of 168 non financial firms listed on the Amsterdam Stock Exchange in May 1997	168	61%
Graham and Harvey (1999)	4400 FEI[d] corporations. 1998 Fortune 500s, from which 313 were also 4400 FEI corporations.	4400	9%

[a] New York Stock Exchange

[b] Chief Financial Officer.

[c] Over-the-Counter market.

[d] Financial Executives Institute.

[655] Because 32 of 1984 Fortune 500's industrial firms ceased to exist, due to acquisition or liquidation, when the survey instrument were actually mailed, the response rate was calculated based on the 468 of these firms that were, at the time, still independent (Norton 1989).

[656] Firms were sampled from *Inc*. 100 (May 1987), *Financial World* 500 (August 1987), *Forbes* 200 (November 1987), and *Business Week* 100 Best Small Growth Companies (May 1987). Criteria for firm inclusion in the sample were different across periodicals.

[657] Largest 500 OTC industrial firms selected from CRSP files sorted based on December 1988 market value of equity.

Appendix 5.5

Table 1

Survey Summary Descriptive Statistics

Number of CEOs/bank	51
Number of banks	33
Median tenure of CEOs (years)	4
Average tenure of CEOs (years)	4.43
Standard deviation of tenure of CEOs (years)	1.97
Minimum tenure of CEOs (years)	10
Maximum tenure of CEOs (years)	2
Number of CEOs of state-owned banks	15
Number of CEOs of Privately-owned banks	36
Number of CEOs of listed banks	19
Number of CEOs of non-Listed banks	32
Number of CEOs of de novo banks	24
Number of CEOs of established banks	27
Number of CEOs of underleveraged banks	23
Number of CEOs of overleveraged banks	28
Average of banks' total assets (10^3 PTE)	719146
Standard deviation of banks' total assets (10^3 PTE)	898592
Minimum banks' total assets (10^3 PTE)	12141
Maximum banks' total assets (10^3 PTE)	4653560

Table 2

Distribution of CEOs' Tenure

Years	Frequency	Percent	Cumulative Percent
2	8	15.7	15.7
3	13	25.5	41.2
4	7	13.7	54.9
5	8	15.7	70.6
6	9	17.6	88.2
7	3	5.9	94.1
8	1	2.0	96.1
9	0	3.9	100.0
10	2	100.0	

Table 3

CEO/Bank's Capital Ratio

Average capital ratio	.085
Standard deviation of capital ratio	.068
Minimum capital ratio	.015
Maximum capital ratio	.315

Chapter 6

Summary and Conclusions

CHAPTER 6: Summary and Conclusions

"[…] our theories don't seem to explain actual financing behavior, and it seems presumptuous to advise firms on optimal capital structure when we are so far from explaining actual decisions"

Stewart Myers, "The Capital Structure Puzzle," (1984)

This chapter summarizes and concludes the dissertation. Results of the investigation are summarized in the first section. The second section contains a discussion on the conclusions as well as some of their implications. Suggestions for future research conclude the chapter.

6.1. SUMMARY OF FINDINGS

Our empirical examination was designed as a comprehensive survey, aiming at characterizing, describing and interpreting the Portuguese bank CEOs' capital structure decisions during the 1989-1998 period. In some respects, the objective of our investigation is similar to other survey-based studies, such as Graham and Harvey (2001). However, our work distinguishes itself from prior research, which pursues the same methodological approach, in a number of aspects. First, our survey was conducted in a face-to-face interview format rather than administered by mail, as is the case with the majority of studies.[658] This research design minimized some of the potential methodological problems that the survey approach may experience, namely, non-response and response biases. In addition, the potential for survey participants interpreting survey questions differently was, at least, reduced in our investigation since interviews were conducted by the author. Secondly, the study was conducted within a single and relatively homogeneous industry, thus avoiding difficulties in controlling the unsystematic effects, inevitably present in cross-sectional samples. Third, we were able to survey a sample representing approximately 90 percent of the population, which compares with an average 20.3 percent response rate in capital structure mail-administered surveys.[659] Fourth, although

[658] See Appendix 2.1 to Chapter 2 and Appendix 5.4 to Chapter 5 for summaries of survey-based research in corporate capital structure.
[659] See Table 5.4 appended to chapter 5.

confidentiality and anonymity were guaranteed to survey participants we were able to control across important bank characteristics: ownership, position in the life cycle, listing condition and capitalization. Fifth, the survey was conducted outside the U.S. and consequently offered a new opportunity for increasing the generalization power of the theoretical propositions submitted to empirical testing. Lastly, we were able to simultaneously examine qualitative data obtained from our survey and quantitative data drawn from our database.

We append as Appendix 6.1 a table summing up our main findings in a self-contained manner. Therefore, only the main results are reviewed here, systematized by category of capital structure determinant.

Overall, our findings suggest that capital structure decisions at the bank level *do matter*. Not surprisingly, the evidence supports the view that managerial strategic financing decision-making is not random, as implied by Modigliani and Miller's irrelevance hypothesis. Responses of survey participants show their concern for the implications of capital structure decisions on bank valuation. Furthermore, it was also documented that capital structure choice, as we hypothesized, shows some (varying) consistency with a number of theoretical propositions put forth by scholars. From this we derive the implication that the theories that elucidate the debt-equity choice in non-financial firms, may prove themselves adequate in explaining bank capital structure decisions, once their financial intermediation idiosyncrasies are taken into consideration.

The acknowledgement that the prevailing ownership structure among Portuguese banks is distant from the prototypical Berle and Means diffusely and publicly held firm, that usually underlies a number of capital structure theories, was crucial in interpreting survey results. Therefore, the informational and governance consequences of this fact had to be properly taken into consideration when drawing conclusions from survey data.

Results suggest that in the managerial perspective embodied in the survey, capital structure policy is likely to be more affected by the incentives structure and governance control rights underlying the different financing instruments, rather than by the aspects related to security design and pricing. In line, signaling, underinvestment and asset substitution problems were found to moderately affect the debt / equity choice.

We did not find evidence consistent with the view that banks' insiders might systematically engage in various forms of excessive risk-taking. Thus, the moral hazard

incentives associated with the deposit insurance regime (and other forms of safety net guarantees) might be less severe in Portugal than in other countries, such as the U.S. Additional explanations may be related to the paucity of "problematic" banks in Portugal, as well as to differences in Portuguese deposit insurance regime compared to the U.S. Results also show some support for the disciplinary role of debt, capital markets and regulatory jurisdiction. However, the strong support received by effect of the *too big to fail* doctrine on capital structure suggests that managerial risk aversion induced by impending bankruptcy might be small.

Problems related to governance issues, such as ownership structure and managerial control appear to be of concern for CEOs of Portuguese banks in deciding about capital structure. However, takeover threats were not indicated as a concern, perhaps because of the presence of regulatory restrictions. Products markets and market for corporate control were not found to be effective mechanisms to mitigate conflicts arising in the respective agency relationships, and thus to discipline insiders.

Results also show that, as expected, taxation at the bank level was only moderately influential on banks capital structure as well as bankruptcy and financial distress considerations.

Taxation at the personal level, transactions costs, free cash flow considerations, and product market were not found to unambiguously affect banks' capital structure choice for reasons related to their financial intermediary role.

We found little evidence supporting the trade-off and the pecking order capital structure policy models. This was not unexpected. Portuguese banks, because they might be less exposed to severe undervaluation caused by adverse selection problems, were not presumed to follow a hierarchy of financing. Moreover, reported financial flexibility is consistent with this interpretation.

6.2. Concluding Remarks

The intuition that capital structure choice is likely to assume the form of a trade-off between costs and benefits associated with such a decision is a well-known useful and appealing concept. Unfortunately, it is manifestly clear that it cannot resolve the central problem of identifying and measuring these costs and benefits, thus leaving undetermined the economic framework that could explain the capital structure conundrum. We believe that there is nothing wrong with the trade-off approach. We also recognize that very

important steps have been made in improving our understanding about the influence of behavioral considerations — like incentives and governance arrangements — of capital structure decisions. The acknowledgement that people, not production functions (or any *invisible hand*) actually make these choices was a significant contribution we owe to Michael Jensen and Bill Meckling, among others. The recognition that there are ownership rights embedded in the securities sold by firms to manage their capital structures, was another important step.[660] Yet another was the perception that buyers and sellers of securities typically get separated and that this could affect the costless exercise of ownership rights. Finally, the acceptance that individuals in making their choices (firms are just real fictions…they do not make decisions!) are unable to behave according to the full rationality paradigm, further extended our understanding of economic behavior. This accumulated knowledge, however, it is not enough to enable the construction of a comprehensive capital structure theory.

Recently, a new perspective has been emerging. The *property rights* approach of the firm, which views the allocation of ownership under the lens of owner control rights on physical assets excluding any other claimholder (Zingales 1998), has been extended. Rajan and Zingales (1998) suggest that the firm should be viewed as "a combination of mutually specialized assets and people" defining the concept of *nexus of specific investments* as "a network of specific investments that cannot be replicated by the market." Also Myers (1999, 139) came forward to recognize that a firm is a "co-investment of human and financial capital."

In this framework, capital structure decisions should be primarily determined by considerations that relate to incentives and allocation of ownership and control rights. Given that, managerial reputation is a central factor in motivating risk-averse corporate managers (Fama and Jensen 1983), we should expect their behavior to be also affected by problems with their human capital specific investments.

In our assessment, the empirical findings gathered in our survey are consistent with this perspective. Managers appear to be primarily concerned with the influence of the incentives associated with the governance arrangements and the control rights allocation

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[660] Central to this evolution was the residual rights of control concept introduced by Grossman and Hart (1986). Williamson (1988, 576) argues that "rather than regard debt and equity as

determined by capital structure decision-making.[661] Their responses seem to indicate less concern with security design, transaction costs and other *tactical* aspects of the capital structure problem.

This is consistent with Stewart Myers' viewpoint[662] that one possible explanation for the capital structure puzzle might be related with the excessive emphasis put on *financing structure* (he called the tactical level of capital structure) in detriment of *financial structure* (he called the strategic level of capital structure).[663] As a consequence, we might have overlooked the "governance-structure attributes of debt and equity" (Williamson 1988, note 17).

Two concluding remarks follow. The first is to acknowledge that we lack a theory with the ability to explain and predict the dynamics of a firm's capital structure choice along its life cycle. This theory should be able to enlighten firm's debt / equity choice such as the decisions to go public and the decisions to go private. The dynamics, over the life cycle of the firm, of crucial factors for capital structure choice determine a complex set of interactions from where it has been difficult to disentangle the individual components. Among those elements is the structure of managerial incentives and therefore managers' motivations and expectations, the organizational form of the firm, as well as its ownership structure. The second relates to restrictions to pure capital structure decisions that are present when share repurchases are restricted, as it is the case in Portugal. We consider this a public policy issue that should deserve, at least, reconsideration at the European Union legislative level. European legislators emphasized creditor protection to restrict stock buybacks. However, banks' largest creditors are depositors whose claims typically benefit from the protection of the public deposit insurer. Other banks' debtholders are usually well informed and sophisticated investors whom are able to accurately and efficiently appraise and price default risk. Furthermore, bank debt offerings are often made under private placement arrangements and "sweetened" by rating notations. Moreover, bank insiders if

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'financial instruments', they are better regarded as different governance structures."

[661] The responses to the motivation to issue convertible securities illustrate this point.

[662] See the 1998 Vanderbuilt University "Roundtable on The Capital Structure Puzzle", and Myers (1999).

[663] The first of these two aspects is related to an operating view of finance in the sense that the kernel of its object is, essentially, an attempt to overcome financial markets incompleteness (we espouse the view that the system of financial markets is not complete) through innovative strategies of security design and pricing. See, e.g. Allen and Gale (1994), Harris and Raviv (1992) and Ross (1989) among others, provide a thoughtful review of this literature.

deprived of an effective defense against hostile takeover threats might resort to external control mechanisms (such as anti-takeover charter amendments) and insulate themselves from the discipline of the market for corporate control.

Concluding, when we started this dissertation project we formulated some generic research questions for this investigation. We first questioned the notion of whether capital structure theories were (either implicitly or explicitly) incorporated in the Portuguese bank CEOs' decisions. We also wondered if capital structure managerial decision-making would provide empirical support for existing theories. Furthermore, we were also curious about the potential determinants of the debt / equity choice. Additionally, the cross-sectional and transnational relevance of capital structure theories also concerned us. Lastly, we were whether an attempt to approach the capital structure problem as a polar case from a field-based methodological perspective would yield clearer insights than the ones provided by the traditional research paradigm.

We believe that we have, at least partially, enlightened some of these issues.

6.3. SUGGESTIONS FOR FUTURE RESEARCH

According to Stiglitz' (1989, note 5) the kernel of capital structure empirical analysis is the search for the "verifiability or falsifiability" of extant theories.[664] In the same vein Fama´s (1990) argues that the development of capital structure theory should stem from "refinements and hypotheses for further testing suggested by what is learned from empirical work." In this framework we see the complementarity between traditional and field-based research in finance as a promising window of opportunity for future research. Empirical results obtained in this investigation shed some light into various research questions at both the banking and non-banking capital structure level. However, they also left important issues unanswered.

The contrast of capital structures of financial and non-financial firms represents a research opportunity that should be pursued in the future, extending the focus of these investigation efforts to other empirical realities, such as other industries and countries.

Further work within the same research design could be pursued surveying CEOs of Portuguese non-financial corporations in order to uncover specific patterns of capital

[664] See sections 1.1 and 1.2 of chapter 1 for a related discussion.

structure choices of those firms and contrast them with the results obtained in the survey of Portuguese bank CEOs.

Other possible ways of fostering the usefulness of survey-based investigation for future corporate capital structure research include extending the scope of samples in order to try uncovering stronger evidence, and improving the integration of qualitative and quantitative data. Although this last approach presents new methodological challenges, it may also contribute to overcome some of the known shortcomings of the actual dominant paradigm.

As theoretical literature is still active in proposing new models which could yield new hypotheses for firms' capital structure behavior, this is an important source for new testable propositions, which future work could also envisage submitting to test and contrasting such theories. Capital structure decisions within internal capital markets, life cycle theory of capital structure (Fluck 1999b), and market timing theory of capital structure (Baker and Wurgler 2001) are illustrations of some of the most recent and promising lines for future research in this respect. Additionally, the scope of the research can also be broadened by investigating the role of capital regulatory discipline as a determinant of banks' involuntary capital structure adjustments.

As mathematical statistics literature develops, other methodological avenues can be pursued in future research in this area.[665] Specifically, one could think of innovating in the design of statistical analysis procedures, such as conducting principal component analysis using a statistical procedure that circumvents the potential violation of distributional and measurement scale properties. This could be achieved, for example, using a Spearman correlation matrix as input instead of the Pearson correlation matrix, since the latter requires both normal distributional properties and a ratio measurement scale that typically are not present in the ordinal data usually gathered through survey-based research.■

[665] To the extent of our knowledge, this procedure, or a similar one, has not yet been attempted in the literature. However, such type of methodological innovation would require a prior knowledge of the mathematical properties of the procedure, and the statistical properties of the principal components algorithm.

Appendix 6.1

Summary of Empirical Evidence

Theory / Concept		Survey Findings
Regulatory discipline of capital adequacy	✓	Some preference for the regulatory capital ratio yardstick
Capital market discipline hypothesis	✓	Preference for market value-based ratios. CEOs of listed banks are more concerned with minimizing of bankruptcy risk of financial distress and than their unlisted counterparts. CEOs of privately-owned banks is more influenced by market discipline compared to state-owned banks.
Size effects in debt financing choice	✗	Not found to be significant.
Bank Financial Management Objectives.	✓	Maximization of shareholder value. Enhancing and sustaining financial flexibility. Minimization of a bank's cost of capital. Adhering to an optimal capital structure.
Alignment of manager-owner objective functions	✓	CEOs of privately-owned banks are more oriented towards maximizing owners' wealth than are CEOs of state-owned banks. CEOs of state-owned banks are less concerned with minimizing risk of financial distress than CEOs of privately-owned banks. CEOs of state-owned banks are less concerned with the minimization of capital cost than their privately-owned counterparts. CEOs of both listed and unlisted banks have different levels of interest in bank costs of capital when compared to the industry average.
Reputation hypothesis	✓	Significant difference in the importance assigned to bank reputation by the novo and established bank CEOs.
Disciplinary role of debt	✓	CEOs of under capitalized banks should be more concerned with the disciplinary role of debt. Consequently, we expected that group of CEOs as being influenced by variables that relate to capital structure valuation, such as credit ratings and comparisons to industry average capital ratio.
Capital structure policy	❖	CEOs indicated a preference for a proactive optimal capital structure policy. CEOs who follow an optimal capital structure policy seem to prefer a pro-active approach rather than a passive one.
Capital structure policy	❖	Pecking order of financing.
Influence of capital market level of development on banks' capital structure decisions	✗	Capital market development is a influential factor for capital structure decisions.
Share repurchases and capital structure decisions	✓	Limitations on share repurchases under current Portuguese law, were not considered determinant for bank's capital structure decisions
Manager-shareholder agency problems	❖	Free cash flow hypothesis Managerial risk aversion; Level of effort/compensation; perquisite consumption
External factors affecting capital structure decisions	✓	Bank regulatory and supervisory framework is a relevant factor in capital structure decision-making Takeover threats are not perceived as a meaningful corporate control disciplinary device
External factors affecting capital structure decisions	✗	Strong evidence of the unimportance of share repurchases restrictions. Regulatory intervention in corporate control transactions might explain this result.
Internal factors affecting capital structure decisions	✓	CEOs of 'established' banks are more concerned with the potential influence of bank reputation on capital structure decision-making than their peers of 'de novo' banks. Risk averse behavior is more unlikely among managers of 'de novo' banks. For CEOs of these banks, asset risk appears to be less important than for their 'established' banks counterparts
Impact of Financial Leverage on Investment Policy.	❖	Increased financial leverage is inconsequential for banks' investment policy
Influence of a state of financial distress and insolvency on bank's investment policy	❖	A majority of CEOs considered that a financial distress situation has no influence on investment policy.
Claim dilution	❖	The larger part of CEOs responses indicated that the hypothesized sequential pattern of debt offering was not applicable to their banks.
Influence of taxation on bank's capital structure decisions	✓	Respondents do not perceive tax considerations as playing a significant role in banks' capital structure decisions. More importance to the income taxes at the bank level than at the investor level. Moderate concordance with the tax hypothesis in case of the modification of Portuguese tax laws to reduce debt tax advantage.
Influence of taxation on bank's capital structure decisions	❖	Taxation at the personal level should be incorporated into the corporate capital structure equation
Third hypothesis of DeAngelo and Masulis (1980).	❖	Influence of non-debt tax shelters on bank's capital structure decisions
Third hypothesis of DeAngelo and Masulis (1980).	✓	A majority deemed tax-loss carryforwards as relevant for capital structure.

Tax loss carryforwards and capital structure decisions	✓	Banks carrying tax-loss carryforwards in their balance sheets were more likely to issue equity securities. Evidence supports DeAngelo and Masulis (1980).
Stock price performance and the timing of new security issues	✓	Relevance of bank's stock price performance on the timing of new security offerings
Growth opportunities influence on capital structure	✓	Growth opportunities influence capital structure policy. Moderate support for the underinvestment hypothesis.
Industry average target capital structure	✕	Estimate of banks' average cost of capital compared to the industry average
Impact of financial distress and bankruptcy	✓	Bankruptcy proceedings in the banking industry consume more time and involve more costs than is true in similar procedures for non-banking firms
Too big to fail hypothesis	✓	Strong evidence consistent with the too big too fail proposition.
Estimate of bankruptcy costs	❖	Inconclusive.
Motivations for issuing convertible securities	✓	Agency problems between shareholders and managers, and between existing and future shareholders, were cited as the determining factor, followed by lower financing costs
Signaling theory	✓	Results are consistent with the signaling theory that external equity financing signaling effects of Leland and Pyle. The rationale for this signaling argument is deeply rooted in managerial risk aversion
Signaling with Differentiated Debt Financing Offerings.	✓	A large majority of CEOs also indicated that they were unlikely to engage in this signaling activity
Reputational effects on capital structure policy	❖	Evidence is mixed in relation to the influence of reputation on deposit and credit markets. If reputational effects do exist, they might be trivial.
Security private placements and capital structure decisions	✓	High degree of concordance in undertaking private placements of debt issues. Lower concordance with private placements of equity.
Security private placements and private information sharing	✓	Costs associated with asymmetric information problems in banks' new security offerings might not be as severe as usually hypothesized for non-banking firms.
Comparison of prices and returns of bank's private placements and public offerings	❖	Responses indicate that issue prices (therefore capital cost) tend to be marginally lower in private placements (mean score of 3.0). However, investors seems to be better off with private placements than with public offerings (mean score of 4.2)
Marketability hypothesis (covenants; targeting)	✓	Covenants in bank debt contracts, as a means to increase issue marketability is not viewed as important by the CEOs.
Undervaluation hypothesis	✓	Stock price reactions to announcements of (voluntary) equity issues as negligible Stock price reactions to announcements of bank (straight) debt offerings are interpreted as no.
Callable debt and capital structure	✓	Strong support for the hypothesis that issuing callable bonds may bring advantages in case of favorable developments in the term structure of interest rates.
Private placements, covenants and information sharing with investors	✓	Agency costs of debt less severe that for non-banking firms.
Issuing costs, frequency and size of security issues.	✓	Issuing costs are inconsequential for capital structure. Issuing costs would require less frequent "trips" to financial markets and larger scale security offerings.
Scale cost advantages in security issuing	✕	The regression results did not provide evidence in support of the hypothesis.
The disciplinary role of short-term debt financing.	❖	Role of short-term debt financing on capital structure policy.
Riding the yield curve hypothesis.	✓	Significant percentage indicated that attempting to take advantage of the dynamics of the term structure of the interest rates was important. Thus, the evidence provides support to our hypothesis.
Targeting security offerings.	✕	Overcapitalized banks might be willing to target their security offerings to specific segments of investors in order to lower their required rates of return by increasing the sharing of information.
Assets tangibility and financial leverage	✕	A more relative intensive use of such type of assets, ceteris paribus, would likely determine a less intensive use of debt financing and therefore a higher capital ratio.

✓- Indicates statistically significant support; ✕- Indicates absence of statistical significance; ❖ - Indicates inconclusive evidence.

Annex 1

Survey Questionnaire (Portuguese Version)

As Decisões de Estrutura de Capital dos Bancos Portugueses: Evidência Empírica (1989 / 1998)

Questionário da Entrevista*

Mário Coutinho dos Santos

Janeiro 1999

*** Para uso restrito ao projecto de investigação da tese de doutoramento de Mário Coutinho dos Santos**

Nome:

Banco:

Local: **Data:**

A – *Caracterização da Política de Estrutura da Capital*

Durante o período de desempenho das suas funções de chefia do órgão de gestão do Banco, o *mix* de acções e títulos de dívida emitidos com o fim de financiar os activos da instituição, naturalmente evoluiu.

Durante tal período, alguma vez foi explicitamente definida uma política de estrutura de capital para o banco?

Se respondeu afirmativamente, poderá enumerar e descrever sinteticamente as características estruturantes dessa política de estrutura de capital do banco?

B – *Compreensão das determinantes das decisões de estrutura de capital durante o período em análise*

1.1. Diferentes indicadores são comummente usados para medir a intensidade da utilização de capital na estrutura de financiamento de um banco. Durante o período de desempenho de funções qual dos indicadores enumerados mereceu a sua preferência?

	Assinale com [X] a sua escolha
Valor contabilístico da dívida / Valor contabilístico do capital próprio	☐
Valor contabilístico da dívida / Valor de mercado do capital próprio	☐
Valor contabilístico do capital próprio / Valor contabilístico do activo total líquido	☐
Valor de mercado da dívida / Valor de mercado do capital próprio	☐
Valor de mercado do capital próprio / Valor contabilístico do activo total líquido	☐
Valor de mercado do capital próprio / Valor de mercado do activo total líquido	☐
Outra (por favor descreva):	☐

1.2. Um banco, como qualquer outra empresa, utiliza recursos financeiros alheios (usualmente de longo prazo) obtidos através da decisão intencionada e discricionária dos órgãos de gestão em contrair endividamento. Durante o período de desempenho de funções indique os componentes desse endividamento mais frequentemente utilizados:

	Assinale com [X] as suas escolhas
Acções preferenciais	☐
Empréstimos subordinados	☐
Financiamento bancário	☐
Obrigações	☐
Títulos de participação	☐
Outro (por favor identifique):	☐

2. Durante o período de desempenho de funções que grau de importância atribuiu, predominantemente, aos objectivos da gestão financeira do banco a seguir enumerados. Atribua o grau de importância relativa numa escala de [1] a [6].

Escala de: [1] "menos importante" a [6] "mais importante"	
Alcançar e manter elevadas notações de *rating* da dívida	☐
Apresentar uma estrutura de capital similar à de outros bancos	☐
Criar ou manter flexibilidade financeira assegurando a disponibilidade de fundos, a independência financeira sustentada e a sobrevivência a longo prazo	☐
Maximizar a cotação dos títulos do banco (acções e obrigações) transaccionados em mercados organizados	☐
Maximizar a quota de mercado (em termos de activos totais líquidos)	☐
Maximizar a relação "cotação / resultado por acção" (PER)	☐
Maximizar a rendibilidade do activo total (resultado líquido / activo total líquido)	☐
Maximizar a rendibilidade do capital próprio (resultado líquido / capital próprio)	☐
Maximizar o crescimento dos resultados por acção	☐
Maximizar o retorno dos accionistas do banco (mais valias + dividendos) num dado horizonte temporal	☐
Maximizar o *valor contabilístico* da acção	☐
Maximizar o *valor contabilístico* do activo total líquido do banco	☐
Maximizar o valor do *cash flow* por acção	☐
Minimizar a probabilidade de insolvência e de falência	☐
Minimizar o custo do capital do banco	☐
Outro (por favor descreva):	☐

3. Durante o período de desempenho de funções indique, por favor, a intenção que predominou nas decisões de financiamento estratégico da instituição.

	Assinale com [X] a sua escolha
Cumprir um conjunto de princípios orientadores, previamente definido, do financiamento do banco *(se escolhida, por favor, responda em seguida à questão 3.3.)*	☐
Definir e procurar manter uma estrutura de capital alvo *(se escolhida, por favor responda em seguida à questão 3.1.)*	☐
Encontrar uma estrutura de capital óptima por comparação entre os respectivos custos e benefícios económicos	☐
Manter o padrão de financiamento historicamente utilizado pelo banco	☐
Seguir uma hierarquia de exaustão das fontes de financiamento de longo prazo disponíveis para o financiamento estratégico do banco *(se escolhida, por favor, responda em seguida à questão 3.2.)*	☐
Tem dúvidas / Sem opinião	☐
Prefere não responder	☐
Outra (por favor descreva):	☐

(*Só se em 3. escolheu* "Definir e manter uma estrutura de capital alvo")

3.1. Como foi definida a estrutura de capital alvo?

	Assinale com [X] a sua escolha
Adoptando o valor médio sectorial para o indicador "grau de endividamento"	☐
Pela análise dos custos e benefícios associados a estruturas de capital alternativas	☐
Por réplica da estrutura de capital de um banco concorrente	☐
Outra (por favor descreva):	☐

3.1.1. Que factores, ou circunstâncias, poderão na sua opinião ter justificado o eventual afastamento da estrutura de capital alvo do banco?

Assinale com [X] as suas escolhas	
A alteração na rendibilidade do activo total (ROA) do banco	☐
A alteração na rendibilidade do capital próprio (ROE) do banco	☐
A exaustão das economias fiscais associadas aos custos do endividamento	☐
A modificação não antecipada na composição da carteira de oportunidades de crescimento do banco	☐
A variação sustentada na cotação das acções do banco	☐
Tem dúvidas / Sem opinião	☐
Prefere não responder	☐
Outro (por favor descreva):	☐

(*Só se em 3. escolheu* "Seguir uma hierarquia de exaustão das fontes de financiamento disponíveis")

3.2. Tendo como critério a prioridade de utilização e exaustão, hierarquize, por favor, as fontes de recursos financeiros de longo prazo predominantemente utilizadas na política de financiamento do banco.

Escala de: [1] "menos prioritária" a [6] "mais prioritária"	
Acções ordinárias	☐
Acções preferenciais	☐
Acções preferenciais convertíveis	☐
Dívida convertível em acções	☐
Dívida subordinada	☐
Obrigações	☐
Resultados retidos	☐
Títulos de participação	☐

(*Só se em 3. escolheu* "Respeitar um conjunto de princípios orientadores, previamente definido, do financiamento do banco")

3.3. Por favor, indique a fonte responsável pela definição dos princípios da política de financiamento estratégico do banco:

	Assinale com [X] a sua escolha
Aprovação de proposta formulada pela divisão funcional de gestão financeira da instituição	☐
Deliberação da Assembleia Geral de Accionistas (ou estrutura equivalente do sistema de governo do banco)	☐
Deliberação do Conselho de Administração (ou órgão equivalente)	☐
Outro (por favor descreva):	☐

4. Durante o período de desempenho de funções que factores de índole externa considera de maior influência nas decisões de escolha ou ajustamento da estrutura de capital do banco. Atribua o grau de influência relativa numa escala de [1] a [6]:

	Escala de: [1] "menos influente" a [6] a "mais influente"
A possibilidade de ocorrência de um *takeover*	☐
Alteração do peso do défice público no produto interno	☐
Alterações no quadro regulador e de supervisão da actividade bancária	☐
Comportamento do consumo privado	☐
Comportamento do mercado cambial	☐
Comportamento do mercado de capitais	☐
Desempenho conjuntural da economia internacional	☐
Desempenho conjuntural da economia nacional	☐
Estabilidade política	☐
Modificação na dinâmica da procura de crédito bancário	☐
Modificações na tributação do rendimento das empresas e dos investidores	☐
Restrições legais relativas à aquisição de acções próprias	☐
Variações nas taxas de juro	☐
Outro (por favor descreva):	☐

4.1. Durante o período de desempenho de funções qual a relevância atribuída ao nível de desenvolvimento do mercado de capitais português para efeitos das decisões de estrutura de capital do banco?

Assinale com [X] a sua escolha

☐ [1] Totalmente irrelevante	☐ [2] Muito pouco relevante	☐ [3] Pouco relevante	☐ [4] Algo relevante	☐ [5] Muito relevante	☐ [6] Totalmente relevante
Tem dúvidas / Sem opinião ☐					
Prefere não responder ☐					

4.2. Como qualifica a repercussão nas decisões de estrutura de capital do banco, do limite máximo de 10% imposto na legislação Portuguesa à aquisição de acções próprias?

Assinale com [X] a sua escolha

☐ [1] Totalmente irrelevante	☐ [2] Muito pouco relevante	☐ [3] Pouco relevante	☐ [4] Algo relevante	☐ [5] Muito relevante	☐ [6] Totalmente relevante
Tem dúvidas / Sem opinião ☐					
Prefere não responder ☐					

5. Durante o período de desempenho de funções que factores de índole interna considerou de maior influência nas decisões de escolha ou ajustamento da estrutura de capital do banco. Atribua o grau de influência relativa numa escala de [1] a [6]:

Escala de: [1] "menos influente" a [6] "mais influente"	
A admissão à cotação das acções do banco num mercado bolsista organizado	☐
A estrutura accionista e o controlo da gestão da instituição	☐
A existência de outras fontes de economia fiscal para além do custo do endividamento como, por exemplo, as amortizações e as provisões	☐
A grande dimensão do *free cash flow* (fundos disponíveis para afectação discricionária dos gestores)	☐
A influência nos resultados por acção (evitar a diluição)	☐
A *performance* histórica da cotação das acções do banco	☐
A política de distribuição de resultados (nível de retenção de resultados)	☐
A política de investimento / o aproveitamento de oportunidades de crescimento / investimento	☐
A viabilização financeira de objectivos estratégicos futuros	☐
Alteração do nível de risco dos activos (risco de negócio)	☐
As economias fiscais associadas ao custo do endividamento	☐
Corrigir *mispricings* em emissões de títulos passadas	☐
Custos de emissão de acções e títulos de dívida	☐
Dimensão do banco (em termos do valor contabilístico do total dos activos)	☐
Evitar *mispricings* em futuras emissões de títulos	☐
Inclusão de cláusulas restritivas em contratos de financiamento subscritos pelo banco	☐
Mudanças no nível da tributação incidente sobre os investidores nas mais valias, dividendos e juros obtidos em títulos emitidos pelo banco	☐
O risco de dificuldades financeiras e/ou de insolvência e os custos tipicamente associados a tais situações	☐
Perspectivas dos gestores quanto à *performance* futura do banco	☐
Recomposição da carteira de activos do banco	☐
Reputação do banco junto dos clientes, dos investidores e autoridades de regulação e supervisão	☐
Variação na rendibilidade do banco	☐

5.1. Quando o *free cash flow* do banco foi de grande dimensão, a que acção subsequente de ajustamento da estrutura de capital, tipicamente, se associou?

	Assinale com [X] a sua escolha
Amortização antecipada de dívida	☐
Aquisição de acções próprias	☐
Nova emissão de acções	☐
Nova emissão de dívida	☐
Tem dúvidas / Sem opinião	☐
Prefere não responder	☐
Outro (por favor descreva):	☐

5.2. Quando o *free cash flow* do banco foi de grande dimensão e a decisão de estrutura de capital se associou a uma nova emissão de títulos de dívida como se caracterizava a estrutura accionista:

	Assinale com [X] a sua escolha
Atomizada, com accionista(s) de referência e com reduzida participação accionista dos gestores	☐
Atomizada, com accionista(s) de referência e com significativa participação dos accionista gestores	☐
Atomizada, sem accionista(s) de referência e com reduzida participação accionista dos gestores	☐
Atomizada, sem accionista(s) de referência e com significativa participação accionista dos gestores	☐
Concentrada e com reduzida participação accionista dos gestores	☐
Concentrada e com significativa participação accionista dos gestores	☐
Tem dúvidas / Sem opinião	☐
Prefere não responder	☐
Outro (por favor descreva):	☐

5.3. Quando o *free cash flow* do banco foi de grande dimensão e a decisão de estrutura de capital se associou a uma nova emissão de títulos dívida e a estrutura accionista do banco se configurava, tipicamente, como atomizada, sem accionista(s) de referência e com reduzida participação accionista dos gestores, em que medida a associa aos seguintes factores:

Atribua percentagens que perfaçam 100%	
Fruição discricionária de regalias inerentes ao exercício do cargo	☐
Gestão da relação empenhamento-compensação dos gestores	☐
Propensão dos gestores para adoptar projectos de mais elevado perfil de risco-retorno	☐
Outros factores	☐

6. A elevação do nível de endividamento é susceptível de influir na política de investimento. Tendo como referência o período considerado, como caracteriza a sua influência predominante?

Assinale com [X] a sua escolha	
Acentuou a propensão para a adopção de projectos de elevado risco-retorno	☐
Acentuou a propensão para a adopção de projectos de reduzido risco-retorno	☐
Não teve qualquer influência	☐
Tem dúvidas / Sem opinião	☐
Prefere não responder	☐
Outro (por favor descreva):	☐

7. Um quadro de debilidade financeira é susceptível de influenciar a política de investimento. Tendo como referência o período considerado, como caracteriza essa influência?

Assinale com [X] a sua escolha	
Motivou nova emissão de acções para financiar a realização de projectos criadores de valor	☐
Não motivou nova emissão de acções para financiar a realização de projectos criadores de valor	☐
Não teve qualquer influência	☐
Tem dúvidas / Sem opinião	☐
Prefere não responder	☐
Outro (por favor descreva):	☐

8. No período considerado como caracteriza a política de emissão de <u>dívida financeira</u> do banco?

Assinale com [X] a sua escolha	
Emissões alternadas com emissões de acções	☐
Emissões sucessivas	☐
Não aplicável	☐
Tem dúvidas / Sem opinião	☐
Prefere não responder	☐
Outro (por favor descreva):	☐

9.1. Indique, por favor, a ordem de relevância atribuída à repercussão nas decisões de estrutura de capital do banco de alterações nos seguintes tipos de fiscalidade:

Escala de: [1] "total irrelevância" a [6] "total relevância"	
Tributação sobre os dividendos distribuídos pelo banco aos accionistas	☐
Tributação sobre os ganhos de capital (mais valias) obtidos pelos titulares de acções do banco	☐
Tributação sobre os juros de títulos de dívida pagos pelo banco aos investidores	☐
Tributação sobre os lucros gerados pelo banco	☐
Tem dúvidas / Sem opinião	☐
Prefere não responder	☐
Outro (por favor descreva):	☐

9.2. Durante o período de desempenho de funções como avalia a relevância das diferenças na tributação (ao nível do investidor) incidente nos resultados retidos, nos dividendos e juros recebidos e das mais valias obtidas, nas decisões de estrutura de capital do banco?

Assinale com [X] a sua escolha

☐ [1] Totalmente irrelevante	☐ [2] Muito pouco relevante	☐ [3] Pouco relevante	☐ [4] Algo relevante	☐ [5] Muito relevante	☐ [6] Totalmente relevante

Tem dúvidas / Sem opinião	☐
Prefere não responder	☐

9.3. Durante o período de desempenho de funções como avalia a influência de outras fontes de economia fiscal que não o custo do endividamento (por exemplo as amortizações e as provisões para crédito vencido), na tomada de decisão de estrutura de capital do banco?

Assinale com [X] a sua escolha

☐ [1] Totalmente irrelevante	☐ [2] Muito pouco relevante	☐ [3] Pouco relevante	☐ [4] Algo relevante	☐ [5] Muito relevante	☐ [6] Totalmente relevante

Tem dúvidas / Sem opinião	☐
Prefere não responder	☐

9.4. Se os dividendos das acções ordinárias e preferenciais fossem fiscalmente dedutíveis, em que medida teria concordado com a preferência pela emissão de acções em detrimento de títulos de dívida?

Escala de: [1] "total discordância" a [6] "total concordância"

Grau de concordância	☐
Tem dúvidas / Sem opinião	☐
Prefere não responder	☐

9.5. Como avalia o grau de possibilidade de poder ter reduzido o recurso ao financiamento por emissão de dívida na eventualidade de o custo desse financiamento ter deixado de ser fiscalmente dedutível, a exemplo do que aconteceu nos EUA com as emissões de dívida a muito longo prazo (mais de 40 anos)?

Escala de: [1] "totalmente impossível" a [6] "totalmente possível"

Grau de possibilidade	☐
Tem dúvidas / Sem opinião	☐
Prefere não responder	☐

9.6. Como avalia a relevância que a existência de situações de reporte fiscal de prejuízos poderá, tipicamente, ter tido nas decisões de estrutura de capital?

Assinale com [X] a sua escolha

☐ [1] Totalmente irrelevante	☐ [2] Muito pouco relevante	☐ [3] Pouco relevante	☐ [4] Algo relevante	☐ [5] Muito relevante	☐ [6] Totalmente relevante
Tem dúvidas / Sem opinião					☐
Prefere não responder					☐

(*Só se em 9.6. escolheu* "Muito relevante" *ou* "Totalmente relevante")

9.6.1. Que tipo de título teria emitido com maior probabilidade um banco que dispusesse de oportunidades de reporte fiscal de prejuízos?

Assinale com [X] a sua escolha

Acções	☐
Títulos de dívida	☐
Indiferente	☐
Tem dúvidas / Sem opinião	☐
Prefere não responder	☐

10.1. Na sua opinião qual foi, tipicamente, a relevância das condições do mercado de capitais na escolha do momento para efectuar uma nova emissão de acções ordinárias?

Assinale com [X] a sua escolha

☐ [1] Totalmente irrelevante	☐ [2] Muito pouco relevante	☐ [3] Pouco relevante	☐ [4] Algo relevante	☐ [5] Muito relevante	☐ [6] Totalmente relevante
Tem dúvidas / Sem opinião ☐					
Prefere não responder ☐					

10.2. Na sua opinião qual foi, tipicamente, a relevância das condições do mercado de capitais na escolha do momento para efectuar uma nova emissão de dívida?

Assinale com [X] a sua escolha

☐ [1] Totalmente irrelevante	☐ [2] Muito pouco relevante	☐ [3] Pouco relevante	☐ [4] Algo relevante	☐ [5] Muito relevante	☐ [6] Totalmente relevante
Tem dúvidas / Sem opinião ☐					
Prefere não responder ☐					

11. Na sua opinião qual foi, tipicamente, a relevância do comportamento da cotação das acções do banco na escolha do momento para efectuar uma nova emissão de títulos (acções ou títulos de dívida)**?**

Assinale com [X] a sua escolha

☐ [1] Totalmente irrelevante	☐ [2] Muito pouco relevante	☐ [3] Pouco relevante	☐ [4] Algo relevante	☐ [5] Muito relevante	☐ [6] Totalmente relevante
Tem dúvidas / Sem opinião ☐					
Prefere não responder ☐					

12. Qual foi relevância que no banco a carteira de oportunidades de investimento disponíveis, tipicamente, desempenhou no processo de escolha entre o lançamento de uma nova emissão de acções ou de dívida?

Assinale com [X] a sua escolha

☐ [1] Totalmente irrelevante	☐ [2] Muito pouco relevante	☐ [3] Pouco relevante	☐ [4] Algo relevante	☐ [5] Muito relevante	☐ [6] Totalmente relevante

Tem dúvidas / Sem opinião	☐
Prefere não responder	☐

13. Em termos médios e durante o período considerado como compara o custo médio do capital do banco em relação à média do sector?

Escala de: [1] "muito inferior" a [6] "muito superior"

Grau de comparabilidade	☐
Idêntico	☐
Tem dúvidas / Sem opinião	☐
Prefere não responder	☐

14. Qual a magnitude da redução (<u>em pontos percentuais</u>) do custo de capital do banco que o poderia ter levado a considerar a possibilidade de revelar informação privilegiada ao mercado de capitais, incorrendo no risco de dar a conhecer aos concorrentes, estratégias ou planos do banco (como por exemplo um *downsizing*, ou uma entrada em nova área de negócio)?

Atribua pontos percentuais ou assinale com [X] a sua escolha

Pontos percentuais de redução do custo de capital do banco	☐
Tem dúvidas / Sem opinião	☐
Prefere não responder	☐

15. Na eventualidade da emergência de um quadro de dificuldades financeiras e / ou de insolvência, como avalia o tempo dispendido e os custos suportados entre um banco e uma empresa não-financeira atendendo ao facto de aos bancos não se aplicar a Lei de Falências (nº2 do artigo 139º do Decreto-Lei nº 298/92 de 31 de Dezembro)**?**

Assinale com [X] a sua escolha

Mais tempo dispendido e mais custos suportados	☐
Mais tempo dispendido e menos custos suportados	☐
Mais tempo dispendido mas os mesmos custos suportados	☐
Menos tempo dispendido e mais custos suportados	☐
Menos tempo dispendido e menos custos suportados	☐
Menos tempo dispendido mas os mesmos custos suportados	☐
Mesmo tempo dispendido e mais custos suportados	☐
Mesmo tempo dispendido e menos custos suportados	☐
Mesmo tempo dispendido e mesmos custos suportados	☐
Tem dúvidas / Sem opinião	☐
Prefere não responder	☐

16. Como qualifica, tipicamente, a relevância da dimensão — medida em termos do valor contabilístico do activo total líquido — na probabilidade de falência de um banco?

Assinale com [X] a sua escolha

☐ [**1**] Totalmente irrelevante	☐ [**2**] Muito pouco relevante	☐ [**3**] Pouco relevante	☐ [**4**] Algo relevante	☐ [**5**] Muito relevante	☐ [**6**] Totalmente relevante
Tem dúvidas / Sem opinião					☐
Prefere não responder					☐

17. Na eventualidade de uma hipotética falência de uma instituição bancária, qual a sua melhor estimativa para o <u>total</u> dos custos, directos (por exemplo, honorários de advogados e custas judiciais) e indirectos (por exemplo, perda de relações comerciais, negócios e de lucros), em termos da percentagem da redução do valor contabilístico do total dos activos dessa instituição?

Assinale com [X] a sua escolha	
Ausência de redução do valor contabilístico do total dos activos	☐
De 0% a 10%	☐
De 10% a 20%	☐
De 20% a 30%	☐
De 30% a 40%	☐
De 40% a 50%	☐
Mais de 50%	☐
Tem dúvidas / Sem opinião	☐
Prefere não responder	☐

18. Quais as motivações que entende como mais relevantes para justificar, nas condições de mercado actuais, uma emissão de dívida convertível ou de acções preferenciais pelo banco?

Assinale com [X] as suas escolhas	
A expectativa de um contributo para uma colocação bem sucedida da emissão no mercado	☐
A expectativa de uma apreciação da cotação das acções do banco	☐
Assegurar a manutenção do nível de controlo da gestão do banco pelos gestores	☐
Evitar a diluição da estrutura accionista	☐
Evitar a diluição das posições accionistas dos titulares dos órgãos de gestão	☐
Uma eventual redução do custo de financiamento do emissor	☐
Tem dúvidas / Sem opinião	☐
Prefere não responder	☐
Outro (por favor descreva):	☐

19.1. Que concordância lhe merece a afirmação: " o anúncio da decisão de uma futura emissão de dívida de longo prazo constitui um veículo para os gestores sinalizarem ao mercado de capitais perspectivas favoráveis quanto ao futuro desempenho do banco"?

Escala de: [1] "total discordância" a [6] "total concordância"	
Grau de concordância	☐
Tem dúvidas / Sem opinião	☐
Prefere não responder	☐

19.2. Que concordância lhe merece a afirmação: "o anúncio da decisão de uma futura emissão de acções constitui um veículo para os gestores sinalizarem ao mercado de capitais perspectivas desfavoráveis quanto ao futuro desempenho do banco"?

Escala de: [1] "total discordância" a [6] "total concordância"	
Grau de concordância	☐
Tem dúvidas / Sem opinião	☐
Prefere não responder	☐

20. Como avalia o grau de possibilidade de o banco poder não ter emitido títulos de dívida como forma de se distinguir de outro(s) financeiramente debilitado(s) que tipicamente recorre(m) a esse tipo de financiamento?

Escala de: [1] "totalmente impossível" a [6] "totalmente possível"	
Grau de possibilidade	☐
Tem dúvidas / Sem opinião	☐
Prefere não responder	☐

21. Que acção preferiria tomar no seguinte cenário: "uma nova oportunidade de investimento — por exemplo, uma aquisição — apenas concretizável com o afastamento da estrutura de capital típica do banco ou com o abandono da usual hierarquia de utilização das fontes de financiamento disponíveis"?

Assinale com [X] a sua escolha	
Afastar-se temporariamente da estrutura de capital típica do banco, ou abandonar a hierarquia usual de utilização das fontes de financiamento disponíveis	☐
Alienar activos	☐
Não concretizar a oportunidade de investimento	☐
Reduzir o pagamento de dividendos	☐
Tem dúvidas / Sem opinião	☐
Prefere não responder	☐
Outro (por favor descreva):	☐

22. A *reputação* das instituições que prosseguem a actividade de intermediação financeira junto de, nomeadamente, clientes e investidores, constitui um activo importante. Como caracteriza, tipicamente durante o período em análise, a sua influência nas decisões de estrutura de capital do banco?

Assinale com [X] a sua escolha	
Constitui um incentivo para o estabelecimento de um nível de endividamento mais elevado	☐
Constitui um incentivo para o estabelecimento de um nível de endividamento mais reduzido	☐
Indiferente	☐
Tem dúvidas / Sem opinião	☐
Prefere não responder	☐
Outro (por favor descreva):	☐

23.1 Durante o período de desempenho de funções o banco poderá ter procedido à colocação privada de títulos de dívida. Qual o seu grau de concordância para com tal prática?

Escala de: [1] "total discordância" a [6] "total concordância"	
Grau de concordância	☐
Não aplicável	☐
Tem dúvidas / Sem opinião	☐
Prefere não responder	☐

(*só para bancos não cotados*)

23.2 Durante o período de desempenho de funções o banco poderá ter procedido à colocação privada de acções. Qual o seu grau de concordância para com tal prática?

Escala de: [1] "total discordância" a [6] "total concordância"	
Grau de concordância	☐
Não aplicável	☐
Tem dúvidas / Sem opinião	☐
Prefere não responder	☐

24. Qual o seu grau de concordância para com a afirmação: "as colocações privadas de títulos (acções e obrigações) podem constituir um veículo apropriado à partilha de informação privilegiada do banco com os investidores sem divulgar publicamente tal informação"?

Escala de: [1] "total discordância" a [6] "total concordância"	
Grau de concordância	☐
Tem dúvidas / Sem opinião	☐
Prefere não responder	☐

25. Em termos médios como compara os preços de emissão e os retornos dos investidores de colocações públicas e privadas de títulos efectuadas pelo banco? Compare utilizando uma escala de [1] a [6].

Escala de: [1] "mais reduzido" a [6] "mais elevado"	
Preço de emissão	☐
Retorno dos investidores	☐
Não aplicável	☐
Tem dúvidas / Sem opinião	☐
Prefere não responder	☐

26. Em que medida concorda com a inclusão de cláusulas restritivas em contratos de emissão de dívida subscritos pelo banco se tal inclusão incentivasse a receptividade dos potenciais investidores à emissão?

Escala de: [1] "total discordância" a [6] "total concordância"	
Grau de concordância	☐
Tem dúvidas / Sem opinião	☐
Prefere não responder	☐

27.1. Que reacção típica espera na cotação das acções do banco após o anúncio de uma nova emissão (voluntária) de acções?

Escala de: [1] "descida acentuada" a [6] "subida acentuada"	
Magnitude da reacção	☐
Reacção inexistente	☐
Tem dúvidas / Sem opinião	☐
Prefere não responder	☐

27.2 Que reacção típica espera na cotação das acções do banco após o anúncio de uma nova emissão de dívida?

Escala de: [1] "descida acentuada" a [6] "subida acentuada"	
Magnitude da reacção	☐
Reacção inexistente	☐
Tem dúvidas / Sem opinião	☐
Prefere não responder	☐

28. Em que medida concordaria com a emissão de obrigações de taxa fixa com cláusula de reembolso antecipado tendo como principal objectivo capturar os benefícios de uma eventual variação das taxas de juro de mercado?

Escala de: [1] "total discordância" a [6] "total concordância"	
Grau de concordância	☐
Tem dúvidas / Sem opinião	☐
Prefere não responder	☐

29. Que grau de concordância atribui à afirmação: "a colocação privada de títulos favorece a inclusão de cláusulas restritivas menos penalizantes para o devedor do que a sua oferta pública devido, pelo menos em parte, a uma partilha mais eficiente da informação com os investidores"?

Escala de: [1] "total discordância" a [6] "total concordância"	
Grau de concordância	☐
Tem dúvidas / Sem opinião	☐
Prefere não responder	☐

30. A emissão de títulos (acções ou de dívida) origina custos. Que influência tiveram no período considerado, tipicamente, esses custos na frequência e na dimensão das emissões do banco?

Assinale com [X] a sua escolha

Mais frequentes e de maior dimensão	☐
Mais frequentes e de menor dimensão	☐
Menos frequentes e de maior dimensão	☐
Menos frequentes e de menor dimensão	☐
Não têm influência	☐
Tem dúvidas / Sem opinião	☐
Prefere não responder	☐

31. Como avalia, tipicamente, a relevância da dívida financeira de curto prazo nas decisões de estrutura de capital do banco?

Assinale com [X] a sua escolha

☐ [1] Totalmente irrelevante	☐ [2] Muito pouco relevante	☐ [3] Pouco relevante	☐ [4] Algo relevante	☐ [5] Muito relevante	☐ [6] Totalmente relevante
Tem dúvidas / Sem opinião					☐
Prefere não responder					☐

32. Que relevância atribui à utilização dos efeitos da estrutura temporal das taxas de juro, enquanto potencial instrumento para redução do custo do financiamento, nas decisões de estrutura de capital do banco?

Assinale com [X] a sua escolha

☐ [1] Totalmente irrelevante	☐ [2] Muito pouco relevante	☐ [3] Pouco relevante	☐ [4] Algo relevante	☐ [5] Muito relevante	☐ [6] Totalmente relevante
Tem dúvidas / Sem opinião					☐
Prefere não responder					☐

33. Que factores o poderiam ter feito preferir uma emissão de títulos (de dívida ou acções) visando um grupo homogéneo de investidores a uma outra indiscriminadamente dirigida a todos os potenciais investidores interessados?

	Assinale com [X] as suas escolhas
O impacto no custo do financiamento	☐
O impacto no preço da emissão	☐
O impacto nos custos de emissão	☐
O nível de informação privilegiada a divulgar publicamente	☐
Tem dúvidas / Sem opinião	☐
Prefere não responder	☐
Outro (por favor descreva):	☐

34. Qual a sua estimativa para o grau de variação do "rácio de solvabilidade" (capital próprio / activo total líquido) num cenário "de crescimento do peso dos activos intangíveis — consequência, por exemplo, da aquisição de uma nova rede de distribuição suportada em tecnologias de informação — por imperativo da estratégia competitiva do banco"?

	Escala de: [1] "muito pequeno" a [6] "muito grande" ou marque [X] para outra escolha
Grau de variação ascendente	☐
Grau de variação descendente	☐
Inalterável	☐
Tem dúvidas / Sem opinião	☐
Prefere não responder	☐

Annex 2

Survey Questionnaire (English Version)

Bank Decisions on Capital Structure: Empirical Evidence for Portugal 1989 / 1998

Questionnaire*

Mário Coutinho dos Santos

January 1999

* **This questionnaire is part of a Ph.D. research project. Please do not cite or use without permission from the author.**

Name:

Bank:

Address: **Date:**

A – *Brief Description of Capital Structure Policy*

During your period in office as Chief Executive Officer (CEO), the mix of equity and debt has presumably varied.
Did you ever explicitly design a capital structure policy for your bank?
If so, please specify the most important considerations underlying this policy.

B – *Understanding decisions on capital structure*

1.1. Different measures are commonly used to gauge the intensity of capital use in a bank financing structure. During your time as CEO which of the following did you choose?

	Mark with [X] your choice
Book value of debt / Book value of equity	☐
Book value of debt / Market value of equity	☐
Book value of equity / Book value of net total assets	☐
Market value of debt / Market value of equity	☐
Market value of equity / Book value of net total assets	☐
Market value of equity / Market value of net total assets	☐
Other (please specify):	☐

1.2. During your time as CEO which of the following external sources of funds were more frequently used?

	Mark with [X] your choices
Preferred stock	☐
Subordinated debt	☐
Bank financing	☐
Bonds	☐
Participating bonds	☐
Other (please specify):	☐

2. During your time as CEO what importance did you assign to the following financial management objectives? Please rate in a scale from [1] to [6].

Scale from: [1] "least important" to [6] "most important"	
Achieve and maintain high bond *ratings*	☐
Achieve a capital structure similar to that of other banks	☐
Enhance or sustain financial flexibility, and ensure financial independence and long term survival	☐
Maximize the *market price* of bonds and stock	☐
Maximize the market share (in terms of net total assets)	☐
Maximize the *Price Earnings Ratio* - PER - (share price / earnings per share)	☐
Maximize the *Return on Investment* (net Income / net total assets)	☐
Maximize the *Return on Equity* (net Income / equity)	☐
Maximize the growth of earnings per share	☐
Maximize shareholders' returns (capital gains + dividends) in a specific time horizon	☐
Maximize the *book value* of a share of stock	☐
Maximize the *book value* of the bank's net total assets	☐
Maximize the *cash flow* per share of stock	☐
Minimize the risk of financial distress and bankruptcy	☐
Minimize the bank's cost of capital	☐
Other (please specify):	☐

3. During your time as CEO, please identify the prevailing intention in the bank's strategic financing decision-making:

	Mark with [X] your choice
Follow a previously defined set of guidelines on financing policy *(if selected, please proceed to question 3.3.)*	☐
Achieve and adhere to a definite target for capital structure *(if selected, please proceed to question 3.1.)*	☐
Reach an optimal capital structure by comparison of, both, economic costs and benefits	☐
Keep to the financing pattern historically followed by the bank	☐
Follow a pre-determined hierarchy in exhausting the available strategic financing sources *(if selected, please proceed to question 3.2.)*	☐
Not sure / no opinion	☐
Prefer not to answer	☐
Other (please specify):	☐

(*Only if* "Achieve and adhere to a definite target for capital structure" *was chosen in question 3.*)

3.1. How was the target capital structure defined?

	Mark with [X] your choice
By adopting the average financial leverage ratio of the industry	☐
By means of a cost / benefit analysis of alternative financing strategies	☐
By taking a competitor's capital structure as a benchmark	☐
Other (please specify):	☐

3.1.1. Were there any relevant deviations from the target capital structure? If so, what explains this?

Mark with [X] your choices	
Change in *Return on Investment* (ROA)	☐
Change in *Return on Equity* (ROE)	☐
Depletion of tax economies associated with borrowing costs	☐
Change in the bank's growth opportunities portfolio	☐
Enduring change in the bank's stock price	☐
Not sure / no opinion	☐
Prefer not to answer	☐
Other (please specify):	☐

(*Only if* "Follow a pre-determined hierarchy in exhausting the available financing sources" *was chosen in question 3.*)

3.2. Please prioritize the long-term financing sources resorted to during your time as CEO in terms of their use:

Scale from: [1] "lowest priority" to [6] "highest priority"	
Common stock	☐
Preferred stock	☐
Convertible preferred stock	☐
Convertible debt	☐
Subordinated debt	☐
Straight bonds	☐
Retained earnings	☐
Participating bonds	☐

(*Only if* "Follow a previously defined set of guidelines on financing policy" was chosen in question 3.)

3.3. Please specify the origin of the followed set of guidelines on financing policy:

	Mark with [X] your choice
Proposal from the bank's financial management	☐
Decision of the shareholders general meeting (or equivalent)	☐
Board of directors' deliberation (or similar)	☐
Other (please specify):	☐

4. During your time as CEO, which of the following external factors has had the most important impact on the bank's capital structure decisions? Please rate in a scale from [1] to [6]:

	Scale from: [1] "least important" to [6] "most important"
Possibility of a takeover bid	☐
Change in the ratio of public deficit to gross domestic product	☐
Changes in the regulation and supervision framework	☐
Private consumption behavior	☐
Currency market behavior	☐
Capital market performance	☐
World economy performance	☐
National economy performance	☐
Political instability	☐
Change in the dynamics of credit demand	☐
Change in firms' and investors' income taxation	☐
Legal restrictions on share repurchases	☐
Interest rate changes	☐
Other (please specify):	☐

4.1. During your time as CEO how relevant was the development of the Portuguese capital market for the bank's decisions on capital structure?

Mark with [X] your choice

☐ [1] Totally irrelevant	☐ [2] Largely irrelevant	☐ [3] Somewhat irrelevant	☐ [4] Somewhat relevant	☐ [5] Largely relevant	☐ [6] Totally relevant
Not sure / no opinion ☐					
Prefer not to answer ☐					

4.2. During your time as CEO how important was the existence of a 10% limit on share repurchases, as it exists under current Portuguese law, for the bank's decisions on capital structure?

Mark with [X] your choice

☐ [1] Totally irrelevant	☐ [2] Largely irrelevant	☐ [3] Somewhat irrelevant	☐ [4] Somewhat relevant	☐ [5] Largely relevant	☐ [6] Totally relevant
Not sure / no opinion ☐					
Prefer not to answer ☐					

5. During your time as CEO which of the following internal factors has had the most important impact on bank's decisions on capital structure? Please rate in a scale from [1] to [6]:

Scale from: [1] "least important" to [6] "most important"	
Get the bank's shares listed	☐
Ownership structure and managerial control	☐
Tax economies related to factors other than debt financing, e.g., depreciation and bad-loans provisions	☐
Size of *free cash flow* (cash available for management's discretionary allocation)	☐
Earnings per share (avoid earnings dilution)	☐
Historical performance of bank's shares	☐
Dividend policy (retention rate)	☐
Investment policy / Growth opportunities	☐
Financing viability of strategic objectives	☐
Assets' risk (business risk)	☐
Tax economies associated with debt financing	☐
Correct *mispricings* in past security issues	☐
Floating costs	☐
Bank size measured as the book value of net total assets	☐
Avoid *mispricings* in future security issues	☐
Covenants in debt financing contracts	☐
Rates of taxation on investors' income (dividends, interest and capital gains)	☐
Risk and costs of financial distress and insolvency	☐
Managerial expectations for bank's future performance	☐
Restructuring of bank's asset portfolio	☐
Bank's reputation	☐
Changes in bank's level of profitability	☐

5.1. When *free cash flow* was large which of the following capital structure decisions was made?

	Mark with [X] your choice
Anticipated debt repayment	☐
Share repurchase	☐
New issue of stock	☐
New issue of debt	☐
Not sure / no opinion	☐
Prefer not to answer	☐
Other (please specify):	☐

5.2. When free cash flow was large and new debt was issue, how would you describe the bank's ownership structure?

	Mark with [X] your choice
Diffuse, but with major shareholder(s) and limited managerial ownership	☐
Diffuse, but with major shareholders(s) and significant managerial ownership	☐
Diffuse, no major shareholder(s) and limited managerial ownership	☐
Diffuse, no major shareholder(s) and significant managerial ownership	☐
Concentrated and limited managerial ownership	☐
Concentrated and significant managerial ownership	☐
Not sure / no opinion	☐
Prefer not to answer	☐
Other (please specify):	☐

5.3. When free cash flow was large and new debt was issue, and the ownership structure was diffuse, with no major shareholder(s) and limited managerial ownership, with which of the following scenarios was most likely associated?

Input percentages up to a 100% total	
Propensity for managers to adopt projects with a high risk-return profile	☐
Re-equilibrium of managerial engagement-compensation relationship	☐
Discretionary fruition of perquisites inherent to the function in office	☐
Other	☐

6. An increase in financial leverage is likely to influence investment policy. If so, in which way?

Mark with [X] your choice	
Increased the propensity for adopting higher risk-return projects	☐
Increased the propensity for adopting lower risk-return projects	☐
No influence	☐
Not sure / no opinion	☐
Prefer not to answer	☐
Other (please specify):	☐

7. Financial distress is likely to impact upon investment policy. If so, in which way?

Mark with [X] your choice	
Induced new stock issues to fund enhancing-value projects	☐
Did not induce new stock issues to fund value-enhancing projects	☐
No influence	☐
Not sure / no opinion	☐
Prefer not to answer	☐
Other (please specify):	☐

8. During the time span you are referring to, how do you characterize the bank's pattern of debt issuance?

	Mark with [X] your choice
Alternated with stock issues	☐
Successive issues	☐
Not applicable	☐
Not sure / no opinion	☐
Prefer not to answer	☐
Other (please specify):	☐

9.1. During your time as CEO how do you assess the impact of changes in the following types of taxation on capital structure decisions?

	Scale from: [1] "totally irrelevant" to [6] "totally relevant"
Taxation on dividends	☐
Taxation on capital gains earned on bank's shares	☐
Taxation on interest earned on bank's debt issues	☐
Taxation on the bank's income	☐
Not sure / no opinion	☐
Prefer not to answer	☐
Other (please specify):	☐

9.2. **During your tenure how do you assess the impact of differences in taxation on retained earnings, dividends, interests and capital gains on bank's capital structure decisions?**

Mark with [X] your choice

☐ [1] Totally irrelevant	☐ [2] Largely irrelevant	☐ [3] Somewhat irrelevant	☐ [4] Somewhat relevant	☐ [5] Largely relevant	☐ [6] Totally relevant
Not sure / no opinion ☐					
Prefer not to answer ☐					

9.3. **During your time as CEO how do you evaluate the role of tax economies inherent to sources other than the costs of debt financing sources (like depreciation and / or loan loss provisions), on bank's capital structure decisions?**

Mark with [X] your choice

☐ [1] Totally irrelevant	☐ [2] Largely irrelevant	☐ [3] Somewhat irrelevant	☐ [4] Somewhat relevant	☐ [5] Largely relevant	☐ [6] Totally relevant
Not sure / no opinion ☐					
Prefer not to answer ☐					

9.4. **How could you have agreed issuing more stock, rather than debt, if there had been tax allowances on dividend payouts?**

Scale from: [1] "strongly disagreement" to [6] "strongly agreement"

Rate of agreement	☐
Not sure / no opinion	☐
Prefer not to answer	☐

9.5. How do you rate the likelihood of having issued less debt if have ceased the tax allowance on borrowing costs, as happened in USA with very long-term maturity debt issuances (more than 40 years)?

Scale from: [1] "strongly unlikely" to [6] "strongly likely"

Rate of likelihood	☐
Not sure / no opinion	☐
Prefer not to answer	☐

9.6. How do you assess the impact of tax-loss carryforwards on bank's capital structure decisions?

Mark with [X] your choice

☐ [1] Totally irrelevant	☐ [2] Largely irrelevant	☐ [3] Somewhat irrelevant	☐ [4] Somewhat relevant	☐ [5] Largely relevant	☐ [6] Totally relevant
Not sure / no opinion					☐
Prefer not to answer					☐

(*Only if* "Largely relevant" *or* "Totally relevant*" were chosen in question 9.6.*)

9.6.1. What kind of security is a bank with tax-loss carryforwards most likely to issue?

Mark with [X] your choice

Stock	☐
Debt	☐
Indifferent	☐
Not sure / no opinion	☐
Prefer not to answer	☐

10.1. How did capital market conditions affect the timing of a new issue of common stock?

Mark with [X] your choice

☐ [1] Totally irrelevant	☐ [2] Largely irrelevant	☐ [3] Somewhat irrelevant	☐ [4] Somewhat relevant	☐ [5] Largely relevant	☐ [6] Totally relevant
Not sure / no opinion ☐					
Prefer not to answer ☐					

10.2. How did capital market conditions affect the timing of a new issue of debt?

Mark with [X] your choice

☐ [1] Totally irrelevant	☐ [2] Largely irrelevant	☐ [3] Somewhat irrelevant	☐ [4] Somewhat relevant	☐ [5] Largely relevant	☐ [6] Totally relevant
Not sure / no opinion ☐					
Prefer not to answer ☐					

11. How did the bank's stock price performance affect the timing of new security (whether common stock or debt) issues?

Mark with [X] your choice

☐ [1] Totally irrelevant	☐ [2] Largely irrelevant	☐ [3] Somewhat irrelevant	☐ [4] Somewhat relevant	☐ [5] Largely relevant	☐ [6] Totally relevant
Not sure / no opinion ☐					
Prefer not to answer ☐					

12. How did growth opportunities affect the decision of making a new security (whether common stock or debt) issue?

Mark with [X] your choice

☐ [1] Totally irrelevant	☐ [2] Largely irrelevant	☐ [3] Somewhat irrelevant	☐ [4] Somewhat relevant	☐ [5] Largely relevant	☐ [6] Totally relevant
Not sure / no opinion ☐					
Prefer not to answer ☐					

13. During your time as CEO how would you rate the bank's average cost of capital in comparison to the industry average?

Scale from: [1] "very inferior" to [6] "very superior"

Degree of comparability	☐
Similar	☐
Not sure / no opinion	☐
Prefer not to answer	☐

14. What reduction (in percentage points) in the average cost of capital would make you disclosing privileged information to the capital market incurring in the risk of revealing to competitors bank's plans or strategies (like, for example, a planned *downsizing*, or entry in a new venture)?

Input percentage points or mark with [X] your choice

Percentage points reduction in the average cost of capital	☐
Not sure / no opinion	☐
Prefer not to answer	☐

15. How would you evaluate the effects of financial distress (or bankruptcy) considering that, under Portuguese Law, banks have a specific set of procedures to handle these situations (Article No.139, No.2 Decree of Law No. 298/92, from December 31)?

Mark with [X] your choice

More time consumed and more costs incurred than other kind of firms	☐
More time consumed but less costs incurred than other kind of firms	☐
More time consumed and same costs incurred than other kind of firms	☐
Less time consumed but more costs incurred than other kind of firms	☐
Less time consumed and less costs incurred than other kind of firms	☐
Less time consumed and same costs incurred than other kind of firms	☐
Same time consumed but more costs incurred than other kind of firms	☐
Same time consumed but less costs incurred than other kind of firms	☐
Same time consumed and same costs incurred as other kind of firms	☐
Not sure / no opinion	☐
Prefer not to answer	☐

16. How do you assess the impact of bank size — measured as the book value of total assets — upon the risk of bankruptcy?

Mark with [X] your choice

☐ [1] Totally irrelevant	☐ [2] Largely irrelevant	☐ [3] Somewhat irrelevant	☐ [4] Somewhat relevant	☐ [5] Largely relevant	☐ [6] Totally relevant
Not sure / no opinion					☐
Prefer not to answer					☐

17. Assuming a hypothetical bankruptcy what is your estimate of its costs — both direct (e.g., filing and lawyers' fees) and indirect (e.g., lost business, profits and relationships) — in proportion of the book value of the assets?

	Mark with [X] your choice
No reduction in the book value of assets	☐
0% to 10% reduction in the book value of assets	☐
From 10% to 20% reduction in the book value of assets	☐
From 20% to 30% reduction in the book value of assets	☐
From 30% to 40% reduction in the book value of assets	☐
From 40% to 50% reduction in the book value of assets	☐
More than 50% reduction in the book value of assets	☐
Not sure / no opinion	☐
Prefer not to answer	☐

18. What are the main reasons for banks, in actual capital market conditions, to issue convertible bonds or preferred stock?

	Mark with [X] your choices
The expectation of a successful placement of the issue in the market	☐
The expectation of a stock price increase	☐
To avoid lowering managerial control	☐
To avoid the dilution of shareholder's ownership	☐
To avoid the dilution of managerial ownership holdings	☐
To lower financing costs	☐
Not applicable	☐
Not sure / no opinion	☐
Prefer not to answer	☐
Other (please specify):	☐

19.1. Would you agree that "the announcement of a long-term debt issue is a way for managers to signal to capital markets favorable expectations about the bank's future performance"? Please rate in a scale from [1] to [6]:

Scale from: [1] "Strongly disagree" to [6] "Strongly agree"	
Degree of agreement	☐
Not sure / no opinion	☐
Prefer not to answer	☐

19.2. Would you agree that "the announcement of a future stock issue is a way for managers to signal capital markets unfavorable expectations about the bank's future performance"? Please rate in a scale from [1] to [6]:

Scale from: [1] "Strongly disagree" to [6] "Strongly agree"	
Degree of agreement	☐
Not sure / no opinion	☐
Prefer not to answer	☐

20. Do you believe that the bank should have refrained from issuing bonds in order to distinguish itself from other financially debilitated banks that have resorted to this type of financing?

Scale from: [1] "totally impossible" to [6] "totally possible"	
Degree of possibility	☐
Not sure / no opinion	☐
Prefer not to answer	☐

21. What action would you consider when facing the following scenario: "a new growth / investment opportunity cannot be taken without changing the bank's typical capital structure or its traditional hierarchy of sources of financing"?

	Mark with [X] your choice
Change the bank's typical capital structure or traditional financing policy	☐
Sell assets	☐
Pass on the growth / investment opportunity	☐
Reduce dividend payout	☐
Not sure / no opinion	☐
Prefer not to answer	☐
Other (please specify):	☐

22. R*eputation* of financial institutions in general, and banks in particular, is an important asset. How do you describe its influence on capital structure decisions?

	Mark with [X] your choice
Is an incentive for increasing financial leverage	☐
Is an incentive for decreasing financial leverage	☐
No impact on capital structure	☐
Not sure / no opinion	☐
Prefer not to answer	☐
Other (please specify):	☐

23.1 During your time as CEO the bank may have made private offerings (private placements) of debt issues. How did you agree with that practice? Please rate in a scale from [1] to [6]:

Scale from: [1] "Strongly disagree" to [6] "Strongly agree"	
Degree of agreement	☐
Not applicable	☐
Not sure / no opinion	☐
Prefer not to answer	☐

(*Only for non-listed banks*)

23.2 During your time as CEO the bank may have made private offerings (private placements) of stock issues. How did you agree with that practice? Please rate in a scale from [1] to [6]:

Scale from: [1] "Strongly disagree" to [6] "Strongly agree"	
Degree of agreement	☐
Not applicable	☐
Not sure / no opinion	☐
Prefer not to answer	☐

24. Do you agree that "private placements of securities might be an efficient way for a bank to share private information with investors without publicly disclosing privileged information"?

Scale from: [1] "Strongly disagree" to [6] "Strongly agree"	
Degree of agreement	☐
Not sure / no opinion	☐
Prefer not to answer	☐

25. How do you compare the prices and the returns of bank's private placements and public offerings? Compare using a scale from [1] to [6]:

Scale from: [1] "lowest" a [6] "highest"	
Issue price	☐
Investors return	☐
Not applicable	☐
Not sure / no opinion	☐
Prefer not to answer	☐

26. Would agree that the inclusion of covenants in a bank's debt contracts if enhances the marketability of its debt issues?

Scale from: [1] "Strongly disagree" to [6] "Strongly agree"	
Degree of agreement	☐
Not sure / no opinion	☐
Prefer not to answer	☐

27.1. What impact upon a bank's share price would you typically expect following the announcement of a bank's (voluntary) stock issue?

Scale from: [1] "strongest decline" to [6] "strongest rise"	
Magnitude of reaction	☐
No change	☐
Not sure / no opinion	☐
Prefer not to answer	☐

27.2 What impact upon a bank's share price would you typically expect following the announcement of a bank's debt issue?

Scale from: [1] "strongest decline" to [6] "strongest rise"

Magnitude of reaction	☐
No change	☐
Not sure / no opinion	☐
Prefer not to answer	☐

28. Would you issue fixed rate bonds with a call option attached (*callable bonds*) aiming at profiting from an expected decrease in market interest rates?

Scale from: [1] "Strongly disagree" to [6] "Strongly agree"

Degree of agreement	☐
Not sure / no opinion	☐
Prefer not to answer	☐

29. Would you agree with the statement that "typically, private placements of securities allow for less stringent covenants than public offers due, at least in part, to the former being a more efficient means of sharing information with investors"?

Scale from: [1] "Strongly disagree" to [6] "Strongly agree"

Degree of agreement	☐
Not sure / no opinion	☐
Prefer not to answer	☐

30. Issuing securities (whether stock or debt) is costly. How did these costs affect the bank's issuing policy?

Mark with [X] your choice

More frequent and bigger issues	☐
More frequent and smaller issues	☐
Less frequent and bigger issues	☐
Less frequent and smaller issues	☐
No influence	☐
Not sure / no opinion	☐
Prefer not to answer	☐

31. How important was short-term debt in the bank's decisions of capital structure?

Mark with [X] your choice

☐ [1] Totally irrelevant	☐ [2] Largely irrelevant	☐ [3] Somewhat irrelevant	☐ [4] Somewhat relevant	☐ [5] Largely relevant	☐ [6] Totally relevant
Not sure / no opinion					☐
Prefer not to answer					☐

32. What is the relevance of the term structure of interest rates on bank's capital structure decisions?

Mark with [X] your choice

☐ [1] Totally irrelevant	☐ [2] Largely irrelevant	☐ [3] Somewhat irrelevant	☐ [4] Somewhat relevant	☐ [5] Largely relevant	☐ [6] Totally relevant
Not sure / no opinion					☐
Prefer not to answer					☐

33. Why would you favor a new security issue (whether stock or debt) designed for specific groups of investors, rather than an indiscriminate placement?

Mark with [X] your choices	
Impact in the cost of financing	☐
Required level of private information disclosure	☐
Impact on issue's price	☐
Impact of emission costs	☐
Not sure / no opinion	☐
Prefer not to answer	☐
Other (please specify):	☐

34. What is your estimate for bank's capital ratio (Equity-to-Total Assets) in the scenario "of bank's intangible asset-base growth of its relative importance due to imperatives of the competitive strategy (e.g., distribution channels supported by information technology"?

Scale from: [1] "very small" a [6] "very large" or mark [X] for other choice	
Degree of increasing variation	☐
Degree of decreasing variation	☐
Unchanged	☐
Not sure / no opinion	☐
Prefer not to answer	☐

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