

# Bank Capital Structure: Revisiting Evidence from the Field \*

MÁRIO COUTINHO DOS SANTOS  <sup>a</sup>

<sup>a</sup> CICEE, and Universidade Autónoma de Lisboa, Portugal

To cite this article: Coutinho dos Santos, M. 2022. Bank Capital Structure: Revisiting Evidence from the Field. *European Review of Business Economics* II(1): 101-134; DOI: <https://doi.org/10.26619/ERBE-2022.2.1.5>

## ABSTRACT

This paper examines investigates bank (voluntary) capital structure decisions, revisiting a unique dataset gathered through face-to-face interviews with a sample of 51 CEOs of banks, representing 91.5 percent of the total net assets of the Portuguese banking industry, over the 1989-1998 period. Survey evidence documents that the allocation of ownership control rights, growth opportunities, reputation in banking markets, financial flexibility, information signalling, and debt tax shields are significant internal determinants of bank capital structure choice. We also found that capital regulatory discipline is the only significant external determinant. Most survey participants elicited trading off ownership control rights dilution and the benefits of debt / equity securities issuance, and the static trade-off model, as their preferred capital structure policies. The pecking order and the market-timing theories received moderate to weak preference. The paper extends the literature, providing field evidence that capital structure choice does matter for bank value, and it can be explained within the framework of the corporate capital structure theory.

**Keywords:** survey, bank capital structure, target leverage, static trade-off, pecking order, market timing.

**JEL Codes:** C42; G21; G32

\* This paper is dedicated to the memory of Manuel de Oliveira Marques, August 7, 1950 – June 22, 2014, a dear friend and co-author of the initial version of the paper. The author is grateful to Mark Carey, Ricardo Cruz, Gary Emery, Nuno Garoupa, Samuel L. Hayes III, Victor Mendes, Usha Mittoo, João Pinto, Aníbal Santos, João Santos, and Pedro Duarte Silva for insightful discussions, valuable comments, and suggestions. I am also thankful to discussants and participants at the Multinational Financial Society 2006 meetings, European Financial Management Association 2004 meetings, the Financial Management Association International 2004 meetings, the Portuguese Finance Network 2004 meetings; and seminar participants at Católica Porto Business School, Portugal, CICEE – Research Center in Business & Economics, Portugal, School of Economics and Management of the University of Porto, and the Department of Economics, Management and Industrial Engineering of the University of Aveiro, for helpful comments. I also extend my gratitude to all the CEOs for their participation in the survey. All errors and omissions are my own responsibility. An early version of this paper circulated under the title “Does the Corporate Capital Structure Theory Apply to Banks? Evidence from the Field”. This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.



## I. Introduction

BANK CAPITAL STRUCTURE HAS RECEIVED SIGNIFICANT RESEARCH INTEREST from academic, policymaking, supervisory, regulatory and investor communities (e.g., Basel Committee on Banking Supervision, 2019; Greenbaum et al. 2016; Diamond and Rajan, 2000; Miller 1995; Flannery 1994; Marcus, 1983; Orgler and Taggart, 1983; Santomero and Watson, 1977).

However, despite the accumulated research, there are still important questions that need to be satisfactorily answered. For example, why banking organizations are polar cases in terms of capital structure? (Masulis, 1988); and how do banks set their debt/equity mixes? (Diamond and Rajan, 2000).

It is widely acknowledged that empirical findings on capital structure research tend to be sensitive, among other factors, to empirical designs and specifications (e.g., Welch, 2011, 2006).<sup>1</sup>

However, field-based research designs, such as the ones administered through face-to-face interviews, may be helpful in mitigating some of those potential problems (e.g., Akerlof, 2020; Bhandari *et al.*, 2020; Welch, 2006; Tufano, 2001; Graham and Harvey, 2001; Simon, 1997, Preface; Jensen *et al.*, 1989).<sup>2</sup>

This paper aims to fill a gap in the bank capital structure survey research, using the data gathered in a face-to-face interview survey, conducted with a sample of 51 bank CEOs, representing 91.5 percent of the total net assets of the Portuguese banking industry, over the 1989-1998 period.

The primary research objective of the paper is to establish a link between the corporate capital structure theory, and banks' voluntary capital structure decision-making. In addition, we aim to contribute to the literature concerning: (i) the relationship between debt/equity and value at the bank level; (ii) the determinants of bank capital structure choice; and (iii) bank capital structure policy models.

Banks exposed to the discipline of mandatory capital adequacy requirements, take both voluntary and involuntary capital structure decisions. The former, akin to non-bank funding mix choices, the latter carried out to meet regulatory capital requirement determinations (e.g., Besanko and Kanatas, 1996; Cornett and Tehranian, 1994; Keeley, 1989).

However, recent research has documented that, since the early 1990s, banks hold capital ratios in excess of the regulatory minima. This stylized fact suggests that capital regulation may be a second-order determinant of banking capital structure choice (e.g., De Jonghe and Öztekin, 2015; Harding et al. 2013; Gropp and Heider 2010; Berger et al. 2008; Brewer III et al. 2008; Flannery and Rangan 2008; Dietrich and Vollmer 2004).

<sup>1</sup> Among those issues, are included the identification, measurement, and misspecification problems (e.g., Fama and French, 1998; Harris and Raviv, 1990).

<sup>2</sup> Recent non-banking capital structure survey-based papers include Lee et al. (2014), de Jong and Verwijmeren (2011), de Jong and Van Dijk (2007), Brounen et al. (2006, 2004), Bancel and Mittoo (2004), Graham and Harvey (2001), and Harhoff and Körting (1998). See Coutinho dos Santos (2003, p. 97-8) for a review of earlier literature on survey-based capital structure.

Banks exposed to the discipline of mandatory capital adequacy requirements, take both voluntary and involuntary capital structure decisions. The former, akin to non-bank funding mix choices, the latter made to meet regulatory capital requirement determinations (e.g., Besanko and Kanatas, 1996; Cornett and Tehranian, 1994; Keeley, 1989). Notwithstanding the importance of banks' involuntary capital structure decision-making, the focus of the paper is the examination of the preferences of 51 CEOs, representing 91.5 percent of the total net assets of the Portuguese banking industry over the 1989-1998 period, on voluntary capital structure choices, gathered through face-to-face interview surveys.

The paper distinguishes from prior research conducted under similar methodological approach, in several different ways. First, to the best of our knowledge, it is the first survey carried out in relation to bank capital structure choice. Second, it is one of the very few administered through a face-to-face interview format. Third, our survey received an 89.5 percent response rate, in sharp contrast with the average response rate of 20.3 percent in mail-administered capital structure surveys (Coutinho dos Santos, 2003, p. 185, and p. 256). Fourth, reprivatization, during the 1989-1998 sample period, of the banks nationalized in 1975, is an unrepeatable natural experiment and an effective opportunity to study the relationship between ownership and capital structure choice at the bank level.<sup>3</sup> Fifth, our focus on a single industry – banking – mitigates the effects of industrial characteristics on capital structure, present in multi-industry surveys. Finally, although confidentiality and anonymity were guaranteed to survey participants, we were able to control for important bank-specific characteristics, such as ownership, position in the life cycle, listing, and capitalization status.

Survey evidence documents that the objectives of maximizing ROE and shareholders' returns, and minimizing the cost of capital received, on a scale of (1) to (6), resulted in mean scores of 4.8, 4.3, and 4.0, respectively. These results are congruent with the proposition that capital structure matters for bank value. Survey participants elicited ownership and control rights (mean score of 4.6), growth opportunities (mean score of 3.9), reputational capital in banking markets (mean score of 3.9), and financial flexibility (mean score of 3.7), among the most relevant capital structure determinants at the bank level. Managerial private information about banks' prospects (mean score of 3.3), changes in business risk (mean score of 3.2), debt tax shields (mean score of 2.9), non-debt tax shields (mean score of 2.4), and financial distress and bankruptcy risk (mean score of 2.2), received moderate to weak support from CEOs' responses. Supervisory and regulatory discipline were indicated as the external determinants that were the most influential (mean score of 4.3) for capital structure decision-making.

Sixty percent of the CEOs of state-owned banks stated that they follow a capital structure policy of trading off ownership control rights dilution and the benefits of banks' strategic funding choices. Over 27 percent of those CEOs declared their preference for the capital structure tradeoff model, and 13.3 percent for the pecking order of financing.

<sup>3</sup> The reprivatization of the banks nationalized in 1975 was conducted over the 1989-1996 period.

Almost 53 percent of CEOs of privately-owned banks revealed a significant preference for the tradeoff capital structure policy model, 25 percent for the pecking order model, and 19.4 percent for a policy model trading off ownership control rights dilution and the benefits of capital structure choice. The market-timing theory received moderate to weak preference from the CEOs interviewed.

Overall, the paper contributes to the banking capital structure literature, providing field-based evidence consistent with the notion that standard corporate capital structure theory helps describe and explain banking debt-to-equity voluntary choice.

The remainder of the paper is organized as follows: section two discusses the theoretical and empirical background of the banking capital structure problem. Section three examines methodological and empirical implementation issues: it describes survey design, sample selection criteria, and propositions submitted to test in the form of survey questions. The next section presents and discusses survey results. The last section summarizes and concludes the paper.

## **II. Theoretical and Empirical Background**

In a Modigliani and Miller (1958) world, the mix of financial claims issued by a bank would be irrelevant because both individuals and firms could replicate any debt-equity combination on their own. In this framework, banking capital structure choice would be a matter of indifference, and banks would exhibit random leverage ratios.

Despite its unquestionable analytical elegance, under imperfect and frictional financial markets, the irrelevance theorem is not useful to either explain or predict the capital structure of real-world banks. Considered within that framework, bank valuation, all else constant, is contingent on the relative amount of equity capital it carries on its balance sheet (e.g., Greenbaum et al. 2016).

Despite its pivotal role in capital structure theory, the relationship between bank capital structure and value has been relatively under-researched. A recent exception to that research paucity, Mehran and Thakor (2011) report strong support for a positive relationship between bank value and bank equity capital.

A significant body of the literature suggests that bank capital structure choice tends to resemble those of their non-financial peers. Furthermore, it may be able to be described and explained under the standard corporate capital structure theory, namely in terms of determinants, and policy models (see e.g., Greenbaum et al. 2016; Berlin 2011; Gropp and Heider 2010; Kwan 2009; Brewer III et al. 2008; Wall and Peterson 1998; Flannery 1994; Orgler and Taggart 1983).

For example, Gropp and Heider (2010) document that the book and market median leverage ratios of banks, during the 1991-2004 sample period, are 3.86 times higher than leverage ratios of non-banking firms, reported in Frank and Goyal (2009). Flannery and Rangan (2008) document that despite the significant increase during the 1990s in book- and market-valued capital ratios of the U.S. banking industry, they are still far from similar leverage ratios of non-banking firms. Brewer III et al. (2008) report average book capital ratios, from 1992 to 2005, of 8.4 percent for the U.S. and 3.0 percent for Germany.

Berger et al. (2008) and Dietrich and Vollmer (2004) provide evidence of a capital ratio buildup in the aftermath of the 1988 Basel Capital Accord, suggesting that banks may adjust their leverage to specific target capital ratios. Overall, the observation of real-world bank capital structure documents that capital ratios seem to revert to target capital ratios, which, on average, are significantly below the ones exhibited by non-banking firms.

There is no dispute that leveraging-up bank capital structure, *ceteris paribus*, entails a costly increase in bankruptcy risk. However, the governmental *safety net* regime and the *too-big-to-fail* doctrine may provide distortionary incentives to increase banks' riskiness. The former is determined by the relative insensitivity to risk of the safety net mechanisms. The latter because lowering the bankruptcy probability enhances the potential for moral hazard behavior.<sup>4</sup>

The discriminatory tax-deductibility of interest expenses on debt creates a distortionary bias between debt and equity funding, making the former dominate equity capital financing. As suggested in Schepens (2016), this lack of income tax neutrality may lead to less well-capitalized financial institutions. Further, non-debt tax-shields, such as fixed assets depreciation and provisions for loan losses are, arguably, relevant determinants of bank leverage, which may be used to manage tax liability (e.g., Osterberg and Thompson 1996; Scholes *et al.* 1990).

Under specialization on residual risk-bearing and managerial decision-making functions, banks are prone to conflicts of interest within their nexus of contractual relationships. In this framework, the leverage choices of real-world banks may be impacted by the incentive and managerial discretion problems, with welfare implications for claimholders (e.g., Morellec et al. 2018; Mao 2003; Leland 1998). (e.g., Hart and Zingales 2017; Jensen 2010; Jensen and Meckling 1976).

Under asymmetrical information, insiders' capital structure security issuance may signal private information about a bank's prospects to less informed outside investors. Against this background, more highly informed parties have the incentive to reap private information rents, at the expense of less informed counterparts (e.g., Lemmon and Zender, 2019; Gao and Zhu, 2015; Halov and Heider, 2011; Bharath et al. 2009; Lemmon et al. 2008).

Whenever outsiders' verification of the true characteristics of security issuers is too costly or unfeasible, private information about their prospects may be signaled to less informed outside investors, through capital structure security issuance activity (Wall and Peterson 1996; Ross, 1977; Leland and Pyle, 1977). Under these signaling models, debt/equity decisions may become a trade-off between the dilution of ownership control rights and the benefits associated with capital structure security issuing choices (e.g., Boot and Thakor 2011; Ellul 2009; Cronqvist and Nilsson 2005).

Capital structure can be strategically chosen to influence behavior in banking markets. For example, banks may commit to deleveraging in relation to competitors to mitigate potential losses in the value of their reputational capital in bankruptcy states (see e.g., Campello 2003; Bolton and Scharfstein 1990; Chung and Smith 1987). Moreover, as

<sup>4</sup> As the probability of bankruptcy is a monotonically increasing function on leverage and bankruptcy costs are firm specific, they are a primary determinant of capital structure.

lower capital ratios may be perceived by customers as detrimental to their welfare, banks with valuable reputational capital investments may have incentives to lower leverage to avoid potential losses in their charter and franchise values (e.g., Demirgüç-Kunt *et al.*, 2013; Peura and Keppo, 2006; Harker and Zenios, 2000; Demsetz *et al.*, 1996).

### **III. Testable Propositions**

To test the theory that bank capital structure choice matters, survey participants were questioned about the importance assigned to several bank management objectives when deciding on capital structure, including shareholder value maximization and the minimization of the cost of capital.

To gauge the importance assigned to several internal and external determinants of capital structure choice, CEOs were questioned about its relationship with debt- and non-debt related tax shields, agency conflicts of interest, information signaling problems, and banks' strategic behavior on banking markets.

To explore CEOs' preferences towards capital structure policy models, they were asked to select from the static trade-off, the pecking order, the market timing, the neutral mutations, and the ownership control rights dilution model.

### **IV. Research Design and Empirical Implementation**

This survey-based research was designed and conducted using a face-to-face interview format, directed at a sample of the population's CEOs of banks incorporated as autonomous entities under Portuguese law, tenured during the 1989-1998 sample period.<sup>5</sup>

The target population was restricted to the CEOs of banks whose controlling shareholders were residents because we were unsure about the possibility of carrying out personal interviews with CEOs whose controlling shareholders were non-residents.

We excluded from the sample CEOs whose tenure was less than an arbitrarily set limit of two years, as we assumed the horizon of capital structure planning extended beyond that time limit.<sup>6</sup>

Given the dissimilarities between the objective functions of mutual banks and banks organized as open-investment corporations, and the specificities of their banking and governance models, the CEOs of the two mutual banks present in the Portuguese banking system were not included in the target population.

After applying the above criteria, we end up with a target population of fifty-seven CEOs/banks. Six CEOs were unavailable or unwilling to participate in the survey,

<sup>5</sup> Data on the CEO population and tenures were gathered through documental analysis conducted by the author of the banks' annual reports, collected directly from the banks by the author.

<sup>6</sup> Here the rationale is related to the fact that regulators require incorporating banks to hold a minimum amount of equity capital. We assumed that such an amount was likely to be adequate for the first two years, and therefore no subsequent capital structure decisions would be taken during that period of time.

therefore, our sample includes fifty-one CEOs/banks, yielding an 89.5 percent response rate.

The survey was designed as a face-to-face interview supported by a structured questionnaire including one open-end question and fifty-five closed questions, aiming at minimizing both response and non-response biases, and the potential for survey participants to interpret survey questions differently.<sup>7</sup> Where appropriate, survey questions were formulated as a six-point Likert scale to force respondents to discriminate, either positively or negatively, and consequently minimize the tendency for mean answering behavior, typically associated with odd Likert scales.<sup>8</sup>

To avoid response-inducing due to the arbitrary ordering of response categories, we adopted the procedure to sort response items by alphabetic order in the Portuguese version of the questionnaire, which was used in the interviews.

## V. Results

### A. Descriptive statistics

The disclosure of respondents' demographic statistics in our survey is necessarily constrained by the guarantees of anonymity and confidentiality given to survey participants. To provide some descriptive characteristics of the CEOs interviewed, without compromising those guarantees, we report the following summary descriptive statistics: composition of the Portuguese banking system 1989-1998 (Table 1); sample demographics (Table 2); distribution of CEOs' tenure (Table 3); summary statistics (Table 4); and bank total assets, bank, and industry capital ratios (Table 5).<sup>9</sup>

**Table 1**  
**Composition of the Portuguese Banking System**

The table includes the banks whose financial statements were published in APB's "Boletim Informativo".

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Number of banks	27	36	37	36	45	46	46	46	45	46

Source: Coutinho dos Santos, 2003.

According to Table 1, there were 27 banks affiliated with APB in 1989 and 46 in 1998.

After applying the criteria previously described, we identified a target population of fifty-seven CEOs. Fifty-one of them, affiliated with thirty-three banks, represent 80.5% of the average number of banks affiliated with APB during the 1989-1998 period, 91.5%

<sup>7</sup> Interviews were conducted during the second half of 1999, using a Portuguese version of the survey instrument, results were tabulated and reported using the English version, which was professionally translated before the beginning of the fieldwork. A preliminary version of the survey instrument was pretested in September and November 1998, with bank executives holding senior positions, but none at bank CEO level.

<sup>8</sup> Our survey design and implementation followed the fieldwork procedures suggested in Dillman's (1978) 'Total Design Method'.

<sup>9</sup> Tables 1 to 5 use data drawn from banks' annual reports and financial statements published in "Boletim Informativo" by the Portuguese Banking Association, "Associação Portuguesa de Bancos" (APB).

of those banks' total net assets, and exhibiting an average tenure of 4.43 years, participated in the survey.

To extend the analysis, we split survey data by different criteria: (i) bank ownership condition: (ii) state-owned (15 CEOs/banks) and privately-owned banks (36 CEOs/banks); (iii) capitalization condition: over-capitalized (23 CEOs/banks) and under-capitalized banks (28 CEOs/banks); (iv) performance condition: de novo (24 CEOs/banks) and established banks (27 CEOs/banks); and (v) listing condition: listed (19 CEOs/banks) and unlisted banks (32 CEOs/banks).

The average total assets of the banks in which the CEOs participated in the survey is 3,587 (10<sup>6</sup> EUR), with a coefficient of variation of 0.8 (10<sup>6</sup> EUR).

The average capital ratio of the banks in which the CEOs participated in the survey was 0.085, with a coefficient of variation of 1.25.

**Table 2**  
**Sample Demographics (1989-1998)**

	Number
CEO population	57
CEOs	51
Banks	33
Bank/years' population	246
Bank/years' sample	227
CEOs of state-owned banks	15
CEOs of privately-owned banks	36
CEOs of listed banks	19
CEOs of non-listed banks	32
CEOs of <i>de novo</i> banks	24
CEOs of established banks	27
CEOs of underleveraged banks	23
CEOs of overleveraged banks	28

Source: Coutinho dos Santos (2003)

**Table 3**  
**Distribution of CEOs' Tenure (1989-1998)**

Number of 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	0.0	96.1
10	2	3.9	100.0

Source: Coutinho dos Santos (2003)

**Table 4**  
**Summary Statistics (1989-1998)**

The capital ratio was estimated as book value of equity to the book value of total net assets.

Variable	Mean	Standard Deviation	Minimum	Maximum
Total assets (10 <sup>6</sup> euros)	3,587	4,482	61	23,212
Capital ratio (book value)	0.085	0.068	0.015	0.315
CEOs' tenure (years)	4.431	1.972	2	10

Source: Coutinho dos Santos (2003)

**Table 5**  
**Bank Total Assets, Bank and Industry Capital Ratios (1989-1998)**

Both the bank and the industry capital ratios were estimated for the tenure of each CEO. To guarantee anonymity and confidentiality to individual responses from survey participants, we assigned a numerical code to each CEO. In this table, the ordering of CEOs was randomized. PTE is the acronym for the pre-euro Portuguese unit of account, "escudo".

CEO code <sup>a</sup>	Average Total Assets [unit: 10 <sup>6</sup> PTE]	Average Bank Capital Ratio	Average Industry Capital Ratio
1	1,514,367	0.0464	0.0693
2	3,084,525	0.0704	0.0693
3	829,572	0.0429	0.0723
4	298,172	0.0350	0.0639
5	524,994	0.0527	0.0585
6	12,141	0.3153	0.0482
7	290,817	0.0738	0.0465
8	80,648	0.0681	0.0440
9	783,863	0.0476	0.0594
10	439,028	0.0868	0.0444
11	619,520	0.0587	0.0512
12	1,271,808	0.0610	0.0427
13	562,918	0.0409	0.0427
14	1,923,500	0.0575	0.0594
15	2,097,225	0.0384	0.0446
16	157,264	0.0702	0.0482
17	250,571	0.0288	0.0482
18	17,281	0.2750	0.0465
19	500,253	0.0336	0.0723
20	546,718	0.0623	0.0800
21	307,227	0.0635	0.0440

<b>CEO code<sup>a</sup></b>	<b>Average Total Assets [unit: 10<sup>6</sup> PTE]</b>	<b>Average Bank Capital Ratio</b>	<b>Average Industry Capital Ratio</b>
22	1,021,643	0.0660	0.0554
23	557,614	0.0416	0.0501
24	90,939	0.1166	0.0482
25	708,498	0.0359	0.0554
26	569,637	0.0152	0.0465
27	16,529	0.2875	0.0444
27	16,529	0.2875	0.0444
28	1,135,765	0.0580	0.0723
29	473,584	0.0416	0.0524
30	29,661	0.0945	0.0444
31	865,538	0.0821	0.0800
32	495,396	0.0552	0.0774
33	165,792	0.1299	0.0723
34	1,840,135	0.0478	0.0506
35	52,626	0.1573	0.0446
35	52,626	0.1573	0.0446
36	4,653,560	0.0573	0.0446
37	362,583	0.1402	0.0800
38	853,900	0.0371	0.0440
39	65,257	0.1146	0.0465
40	52,848	0.0567	0.0440
41	137,648	0.0772	0.0549
42	672,571	0.0469	0.0446
43	295,263	0.0405	0.0482
44	82,051	0.2137	0.0639
45	2,553,354	0.0272	0.0465
46	1,933,902	0.0409	0.0465
47	591,900	0.0440	0.0440
48	126,471	0.1494	0.0444
49	17,077	0.0935	0.0440
50	103,123	0.1147	0.0761
51	39,184	0.2105	0.0823

<sup>a</sup> To guarantee anonymity and confidentiality to individual responses from survey participants, we assigned a numerical code to each CEO, and their ordering was randomized. Source: Coutinho dos Santos (2003).

## B. Survey results

Survey participants were firstly queried about their preferred metrics for gauging bank financial leverage.

**Table 6**  
**Responses to the question: 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?**

Multiple selections were allowed in answering this question. A total of 72 selections were recorded. Percentages are based upon those 72 responses. Percentages may not add up to 100 percent due to rounding up of percentages.

	[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

Ignoring valuation considerations, results document that 60.6 percent of CEOs revealed a preference for the ‘traditional’ capital ratio measure, while 22.5 percent opted for the debt-to-equity ratio. ‘Other’ specified leverage metrics accounted for 16.9 percent of responses. Results are consistent with prior academic and practitioners’ work, which identified the capital ratio as a ‘popular’ measure of bank leverage.<sup>10</sup>

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.

**Table 6.1**  
**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

<sup>10</sup> 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.

The distribution of CEOs' responses in relation to preferred measures of leverage by ownership — state-owned or privately-owned — indicates that capital ratio was selected by 68.4 percent of the CEOs of state-owned banks and by 76.9 percent of the CEOs of privately-owned banks. In terms of valuation, 65.4 percent of the selections favored book value ratios and 34.6 percent preferred market value ratios, respectively.

As multiple selections were allowed when answering this question, more weight is given to responses with more than one selection. Table 6.2 provides the distribution of CEOs' preferred metrics of bank leverage.

**Table 6.2**  
**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

A Fischer (exact) test of independence indicates that, at the 5 percent significance level ( $p$ -value: 0.0469), CEOs of listed banks may have a preference for market value-based leverage ratios.

To test the proposition that bank capital structure matters for bank valuation, CEOs were questioned about the importance they assigned, on a scale of 1 (least important) to 6 (most important), to several bank management objectives when deciding on capital structure, including the maximization of shareholder value, and the minimization of the cost of capital.

The mean score assigned to the maximization of shareholder value (4.3), when choosing the debt/equity mix, is congruent with the conjecture that capital structure is relevant for bank value. The objective of maximizing banks' return on equity, received a mean score of 4.8, which is also 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 that, at the 5 percent level, the differences in the two-sample means are not statistically significant. Therefore, the null hypothesis of equal population means cannot be rejected.

Financial flexibility, long-term survival and financial independence ranked high in CEOs' objective function (mean score of 4.3). These findings are in line with results reported in the more recent non-banking survey-based research (see, e.g., Brounen et al. 2006 and 2004; Bancel and Mittou 2004; Graham and Harvey 2001).

According to the standard static tradeoff capital structure model, the minimization of the cost of capital is obtained at the optimal capital structure. The mean score on this item (4.0) is interpreted as evidence consistent with the hypothesis that CEOs consider reaching an 'optimal' capital structure as relevant for bank value.

**Table 7A**  
**During your time as CEO, what importance did you assign to the following management objectives?**

Mean scores are based on a scale of 1 (least important) to 6 (most important).

	<b>Mean Scores</b>
Achieve and maintain high debt ratings	3.6
Achieve a capital structure similar to that of other banks	2.5
Enhance and sustain financial flexibility	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 stock book value	2.8
Maximize the book value of the bank's net total assets	2.2
Maximize cash flow per share	2.8
Minimize the risk of financial distress and bankruptcy	3.3
Minimize the bank's cost of capital	4.0

CEOs of state-owned banks are likely to have a different objective function from their privately-owned bank counterparts (e.g., Megginson 2005; La Porta 2002; Dewenter and Malatesta 2001). To test this theory, we split the sample by CEOs of state-owned banks and CEOs of privately-owned banks.

CEOs of state-owned and privately-owned banks, on the shareholders' wealth maximization objective, scored, 3.5 and 4.7, respectively. A one-sided Wilcoxon-Mann-Witney rank sum test of two independent samples indicates that at the 5 percent level (p-value: 0.0468), CEOs of privately-owned banks are more oriented towards maximizing owners' wealth than the CEOs of state-owned banks are.

CEOs of state-owned and privately-owned banks assigned mean scores of 2.5 and 3.7, respectively, on minimizing the risk of financial distress and bankruptcy. A one-sided Wilcoxon-Mann-Witney rank sum test (of two independent samples) indicates that, at the 5 percent level (p-value: 0.0234), CEOs of state-owned banks are significantly less concerned with financial distress and bankruptcy than their privately-owned counterparts. This finding may be interpreted because of the CEOs of state-owned banks' proximity to government, who may take comfort from the presence of the governmental safety-net in financial distress states. The too-big-to-fail doctrine, the weakness of the disciplinary roles of capital markets, and the market for corporate control may enhance

the potential for moral hazard behavior.

**Table 7B**  
**Responses of CEOs of ‘State-Owned’ and CEOs of ‘Privately-Owned’ Banks**  
**to the question: “During your time as CEO, what importance did you assign**  
**to the following management objectives?”**

Mean scores are based on a scale of 1 (least important) to 6 (most important). A bank was considered as state-owned if the State holds a controlling stake, regardless of its size.

<sup>†</sup>, <sup>††</sup>, denote a significant difference at the 5 and the 1 percent level for one-sided tests, respectively.

<sup>\*</sup>, <sup>\*\*</sup>, denote a significant difference at the 5 and the 1 percent level for two-sided tests, respectively.

	State-Owned Banks	Privately- Owned Banks
	Mean Scores	
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 and sustain financial flexibility	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 <sup>†</sup>
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 <sup>†</sup>

The mean scores of CEOs of state-owned and privately-owned banks with respect to the cost of capital minimization, 3.1 and 4.4, respectively, indicate that CEOs of state-owned banks perceive the issue as relatively unimportant, while CEOs of privately-owned banks seem much more concerned with it. A one-sided Wilcoxon-Mann-Witney rank sum test of two independent samples provides significant evidence that, at the 5 percent level ( $p$ -value: 0.0257), CEOs of state-owned banks are less concerned with the minimization of capital cost than their privately-owned counterparts.

*De novo* banks are likely to experience different levels and patterns of performance, when compared to established banks, at least in the early years of their life cycles (e.g., Canhoto and Dermine 2003; DeYoung and Hasan 1998).<sup>11</sup> As the argument goes, CEOs’

<sup>11</sup> We categorized a bank as *de novo* when it was chartered after 1984 and as established when a bank was chartered before 1984, the year the Constitutional amendment reallocated private investment in the Portuguese banking industry.

objective functions of these two types of banks differ in some material dimensions. To study this conjecture, we split the sample accordingly into *de novo* and established banks.

**Table 7C**  
**Responses of CEOs of *De Novo* and CEOs of Established Banks to the question: “During your time as CEO, what importance did you assign to the following management objectives?”**

Banks were categorized as *de novo* if chartered after 1984, and as established, if chartered before 1984.

Mean scores are based on a scale of 1 (least important) to 6 (most important).

<sup>†</sup>, <sup>††</sup>, denote a significant difference at the 5 and the 1 percent level for one-sided tests, respectively.

<sup>\*</sup>, <sup>\*\*</sup>, denote a significant difference at the 5 and the 1 percent level for two-sided tests, respectively.

	<i>De Novo</i> - Banks	Established -Banks
	Mean Scores	
Achieve and maintain high debt ratings	2.8	4.3 <sup>††</sup>
Achieve a capital structure similar to that of other banks	2.0	2.8
Enhance and sustain financial flexibility	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

The mean scores of CEOs of *de novo* and CEOs of established banks indicate that profitability is a common concern. The two cohorts of CEOs rate the objective of maximizing return on equity (ROE) and earnings per share (EPS) growth rates at similar levels, and the importance of credit ratings and the importance assigned to bank reputation in banking markets at different levels.

Capital structure literature suggests that industry average leverage ratio can be a surrogate for the target/preferred capital structure (e.g., D'Mello and Farhat 2008). We hypothesize that the objectives of bank capital structure decision-making with different leverage conditions may also be distinct. To test this hypothesis, we split the sample by 'over-capitalized' versus 'under-capitalized' banks. We classified a bank as 'over-

capitalized', when its average capital ratio during the CEO's tenure was higher than the banking industry's average capital ratio during the same time period and as 'under-capitalized' otherwise.<sup>12</sup>

**Table 7D**  
**Responses of CEOs of 'Over-Capitalized' and CEOs of 'Under-Capitalized' Banks to the question: "During your time as CEO, what importance did you assign to the following management objectives?"**

Bank and industry average capital ratios were estimated for the tenure of each CEO interviewed, using data from the annual financial statements of banks, published in APB's "Boletim Informativo". Banks whose capital ratio during the CEO tenure was higher than the industry's average capital ratio during the same time period, were classified as 'over-capitalized', and as 'under-capitalized', if the capital ratio during the CEO tenure was lower than the industry's. Bank and industry capital ratios were weighted by deflated net total assets. Mean scores are based on a scale of 1 (least important) to 6 (most important).

<sup>†</sup>, <sup>††</sup>, denote a significant difference at the 5 and the 1 percent level for one-sided tests, respectively.

<sup>\*</sup>, <sup>\*\*</sup>, denote a significant difference at the 5 and the 1 percent level for two-sided tests, respectively.

	<b>Over-Capitalized Banks</b>	<b>Under-Capitalized Banks</b>
	<b>Mean Scores</b>	
Achieve and maintain high debt ratings	3.1	4.2 <sup>†</sup>
Achieve a capital structure similar to that of other banks	2.1	2.9 <sup>†</sup>
Enhance and sustain financial flexibility	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 <sup>†</sup>
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 <sup>††</sup>
Maximize the book value of the bank's net total assets	1.8	2.7 <sup>†</sup>
Maximize cash flow per share	2.3	3.5 <sup>†</sup>
Minimize the risk of financial distress and bankruptcy	3.0	3.7
Minimize the bank's cost of capital	3.7	4.3

Survey scores indicate that the significant differences in managerial objectives of CEOs of 'over' and 'under-capitalized' banks relate, among other factors, to debt ratings, maximization of return on investment, and cash flow per share. In all these categories, mean scores of CEOs of 'under-capitalized' banks are higher than those of their 'over-

<sup>12</sup> Banks and industry average capital ratios were computed from a dataset developed by the author based on the annual financial statements of banks published by (APB). Both banks and banking sector average capital ratios were weighted by the deflated value of net total assets.

capitalized' counterparts.

Results are interpreted as consistent with the hypothesis that CEOs of under-capitalized banks may be more concerned with the disciplinary role of leverage. Consequently, we expected the group of CEOs to be influenced by variables that relate to capital structure valuation, such as credit ratings, and deviation from industry target leverage ratio.

To gather CEOs' perceived relevance of several internal determinants of capital structure choice, we ask for their ratings on the influence of, namely, debt- and non-debt related tax shields, conflicts of interest and informational incentives for opportunistic behavior, and strategic funding mix decision-making.

**Table 8A**  
**Responses of Bank CEOs to the question: "During your time as CEO, which of the following internal factors has had the most important impact on the bank's decisions concerning capital structure?"**

Mean scores are based on a scale of 1 (least important) to 6 (most important).

	<b>Mean Scores</b>
List bank's shares	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
Asset 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
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
Reputation in banking markets	3.8
Changes in bank's level of profitability	2.8

Survey participants elicited ownership structure and managerial control, and therefore its informational and governance implications, as the most relevant capital structure determinant at the bank level (mean score of 4.6, on a scale of 1 to 6, see Table 8A). CEOs deemed growth opportunities (mean score of 4.0), reputation in banking markets (mean score of 3.8), financial flexibility (mean score of 3.7), managerial private information signaling (mean score of 3.4), bank size (mean score of 3.3), share listing (mean score of 3.3), business risk (mean score of 3.2), dividend policy (mean score of 3.1), and debt tax-shields (mean score of 3.0), as other important internal determinants of capital structure choice.

To extend our examination of the signaling effects of capital structure choices, we asked CEOs to rate, on a scale of [1] ‘Strongly disagree’ to [6] ‘Strongly agree’, their degree of agreement with the hypothesis that the announcement of a common stock issue may signal insiders’ unfavorable expectations about the issuer’s performance prospects (Ross, 1977).

**Table 8B**  
**Responses to the question: To what extent do you agree that “the announcement of a future stock issue is a way for managers to signal to capital markets their unfavorable expectations about the bank’s future performance?”**

	Mean score	Percent
Degree of agreement	1.8	94.1
Not sure/no opinion		5.9
Prefer not to answer		0.0

Forty-eight survey participants (94.1 percent) provided valid answers, disagreeing and strongly disagreeing with the statement (1.8 mean score). This finding is inconsistent with signaling theory’s prediction that the announcement of a new stock issue by a diffusely held firm is likely to command negative abnormal returns.

To control for the prior question, we asked CEOs to rate the magnitude, on a scale of [1] “strong decline” to [6] “strong increase”, in the expected bank’s stock price reaction, following the announcement of a bank’s (voluntary) stock issue.

The mean score of 3.5 suggests that CEOs perceive the magnitude of abnormal stock returns on the announcement of a bank (voluntary) equity issue, as relatively negligible.<sup>13</sup> According to CEOs interviewed, stock price should not decline following the announcement of a new (voluntary) equity offering. Contrary to Ross’s signaling model, Leland and Pyle’s model assumes a concentrated ownership structure with a block

<sup>13</sup> Rights offerings were the prevalent form of Portuguese banks raising new equity capital during the period 1989-1998 (Coutinho dos Santos and Pacheco, 2006). See also Besanko and Kanatas (1996) for evidence on positive abnormal stock returns on the announcement of rights offerings and its inverse relationship with the share of managerial ownership holdings.

shareholder in control, predicting, in line with Besanko and Kanatas (1996) and Jensen and Meckling (1976), a positive relationship between ownership and value.

**Table 8C**  
**Responses to the question: on a scale of [1] ‘strongest decline’ to [6] ‘strongest increase’ “What impact upon a bank’s share price would you typically expect following the announcement of a bank’s (voluntary) stock issue?”**

	Mean score	Percent
Magnitude of reaction	3.5	62.7
No change		0.0
Not sure/no opinion/Prefer not to answer		37.3

To assess the association between the responses to these two questions, we estimated Spearman’s rank-order correlation coefficient (corrected for ties), between the scores assigned to the two questions. We found a negative correlation of 0.435, which, in a one-tailed test, is statistically different from zero at the 1 percent significance level. Spearman’s correlation sign is consistent with the view that survey participants, on average, disagree that the announcement by a concentrated ownership issuer of a new (voluntary) stock offering conveys bad news to investors.

CEOs considered as less relevant determinants (mean scores lower than 3), changes in profitability (mean score, 2.8), earnings dilution (mean score, 2.6), non-debt tax-shields (mean score, 2.4), stock price performance (mean score, 2.2), and financial distress and bankruptcy risk (mean score, 2.2).

There are significant differences in the perceptions of state-owned and privately-owned banks with respect to the influence of internal factors on bank capital structure decisions.

CEOs of privately-owned banks appear more concerned with the historical performance of bank share price, floating costs, the inclusion of covenants in debt financing contracts, mispricing in past and future security issues, and readjustment in asset portfolios.

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 cohorts of CEOs.

**Table 8D**  
**Responses of CEOs of ‘State-Owned’ and CEOs of ‘Privately-Owned’ Banks to the question: “During your time as CEO, which of the following internal factors has had the most important impact on the bank’s decisions concerning capital structure?”**

Mean scores are based on a scale of 1 (least important) to 6 (most important).

†, ††, denote a significant difference at the 5 and the 1 percent level for one-sided tests, respectively.

\*, \*\*, denote a significant difference at the 5 and the 1 percent level for two-sided tests, respectively.

	State- Owned Banks	Privately- Owned Banks
	Mean Scores	
List bank’s shares	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
Asset 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 <sup>†</sup>
Issuing costs	1.1	2.2**
Bank size	3.4	3.3
Avoid mispricing in future security issues	1.1	2.1 <sup>††</sup>
Covenants in debt financing contracts	1.0	1.8*
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*
Reputation in banking markets	4.1	3.7
Changes in bank’s level of profitability	2.5	2.9

Examination of the perceptions of *de novo* and established banks in relation to the effect of internal determinants on capital structure choice documents that CEOs of established banks are more concerned with the potential influence of a bank’s reputation on capital structure decision-making. The difference is significant at the 5 percent level for a two-sided Wilcoxon-Mann-Whitney test ( $p$ -value, 0.0500).

**Table 8E**  
**Responses of CEOs of De Novo and CEOs of Established Banks to the question: “During your time as CEO, which of the following internal factors has had the most important impact on the bank’s decisions on capital structure?”**

Mean scores are based on a scale of 1 (least important) to 6 (most important).

†, ††, denote a significant difference at the 5 and the 1 percent level for one-sided tests, respectively.

\*, \*\*, denote a significant difference at the 5 and the 1 percent level for two-sided tests, respectively.

	<i>De Novo</i> Banks	Established Banks
	Mean Scores	
List bank’s shares	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
Asset risk	2.8	3.6 <sup>†</sup>
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
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
Reputation in banking markets	3.5	4.2 <sup>†</sup>
Changes in bank’s level of profitability	2.7	3.0

This result suggests that managers of higher franchise value banks may have incentives to adopt low risk-taking policies to prevent putting bank franchise/charter value at risk. CEOs of those banks assigned lower importance to asset risk than their established bank counterparts ( $p$ -value, 0.0423). This managerial risk averse behavior may be less likely among managers of de novo banks because they appear to pursue more aggressive growth strategies, at least, in the early stages of the life cycles of *de novo*

banks.

As documented in Table 8D, CEOs of over-capitalized and under-capitalized banks rate the influence of internal determinants on bank capital structure differently.

**Table 8F**  
**Responses of CEOs of ‘Over-Capitalized’ and CEOs of ‘Under-Capitalized’**  
**Banks to the question: “During your time as CEO, which of the following**  
**internal factors has had the most important impact on the bank’s decisions**  
**concerning capital structure?”**

Mean scores are based on a scale of 1 (least important) to 6 (most important).

<sup>†</sup>, <sup>††</sup>, denote a significant difference at the 5 and the 1 percent level for one-sided tests, respectively.

<sup>\*</sup>, <sup>\*\*</sup>, denote a significant difference at the 5 and the 1 percent level for two-sided tests, respectively.

	<b>Over- Capitalized Banks</b>	<b>Under- Capitalized Banks</b>
	<b>Mean Scores</b>	
List bank’s shares	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 <sup>†</sup>
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 <sup>†</sup>
Asset risk	2.7	3.9 <sup>††</sup>
Tax economies associated with debt financing	2.6	3.3 <sup>†</sup>
Correct mispricing in past security issues	1.5	2.7 <sup>††</sup>
Issuing costs	1.7	2.0
Bank size	2.8	3.9 <sup>†</sup>
Avoid mispricing in future security issues	1.4	2.4 <sup>†</sup>
Covenants in debt financing contracts	1.2	2.0 <sup>†</sup>
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 <sup>†</sup>
Reputation in banking markets	3.4	4.3 <sup>†</sup>
Changes in bank’s level of profitability	2.2	3.6 <sup>††</sup>

Survey evidence documents statistically significant differences between the mean scores of the two groups of CEOs, including in relation to financial flexibility, covenants

in debt contracts, changes in profitability, reputational capital in banking markets, free cash flow, bank size, asset risk, asset portfolio restructuring, and security mispricing.

Overall, and despite the variation in the relative importance assigned by the two cohorts of CEOs to capital structure internal determinants, it seems well-founded to conclude that our survey-based evidence is consistent with the hypothesis that capital structure matters for bank value.

It is conventional wisdom that external institutional and environmental factors may affect banking capital structure choice. To elicit perceptions of the relevance assigned to several external determinants identified in extant research, CEOs were asked to appraise, on a scale of 1 (least important) to 6 (most important), the importance of several of those factors.

**Table 9A**  
**Responses to the question: “During your time as CEO, which of the following external factors has had the most important impact on the bank capital structure decisions?”**

Mean scores are based on a scale of 1 (least important) to 6 (most important).

<sup>+</sup>, <sup>++</sup>, denote a significant difference at the 5 and the 1 percent level for one-sided tests, respectively.

<sup>\*</sup>, <sup>\*\*</sup>, denote a significant difference at the 5 and the 1 percent level for two-sided tests, respectively.

	<b>Mean Scores</b>
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
Domestic economy performance	2.9
Political instability	2.3
Change in the dynamics of credit demand	3.1
Change in the income taxation of firms and investors	2.8
Legal restrictions on share repurchases	1.8
Interest rate changes	2.6

Response scores document that the changes in the banking regulatory and supervisory jurisdiction are perceived as the most 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) for such decisions that, to a certain extent, may be interpreted as contradictory to the market-timing hypothesis.

Takeover threats were not perceived as a meaningful corporate control disciplinary device (average score, 1.8). This result suggests that regulatory intervention in banking

may be a substitute, although imperfect, for the discipline of both the capital market and the credit and deposit markets. Additionally, regulatory restrictions on takeover activity in banking may account for CEOs' lack of concern about takeover threats (e.g., Prowse 1997). This conclusion is reinforced when the sample is split between CEOs of state-owned banks and privately-owned banks.

Changes in macroeconomic condition, such as the ratio of public deficit to gross domestic product, private consumption behavior, performance of both the domestic and global economies, and institutional environmental factors, such as changes in tax laws were among the external determinants, deemed as largely irrelevant to bank capital structure decisions.

**Table 9B**  
**Responses of CEOs of 'State-Owned' and CEOs of 'Privately-Owned' Banks to the question: "During your time as CEO, which of the following external factors has had the most important impact on bank capital structure decisions?"**

Mean scores are based on a scale of 1 (least important) to 6 (most important).

<sup>†</sup>, <sup>††</sup>, denote a significant difference at the 5 and the 1 percent level for one-sided tests, respectively.

<sup>\*</sup>, <sup>\*\*</sup>, denote a significant difference at the 5 and the 1 percent level for two-sided tests, respectively.

	<b>State- Owned Banks</b>	<b>Privately- Owned Banks</b>
	<b>Mean Scores</b>	
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 <sup>††</sup>
Currency market behavior	1.0	1.6**
Capital market performance	2.2	3.8**
World economy performance	1.4	2.0 <sup>††</sup>
Domestic economy performance	2.3	3.2 <sup>†</sup>
Political instability	1.8	2.4
Change in the dynamics of credit demand	2.8	3.2
Change in the income taxation of firms and investors	1.9	3.1*
Legal restrictions on share repurchases	1.0	2.1**
Interest rate changes	1.7	2.9**

As expected, CEOs of privately-owned banks show more concern about the influence of capital market performance when deciding about bank capital structure, than the CEOs of state-owned banks. The difference is statistically significant at the 1 percent level for a two-sided test. Albeit both cohorts of CEOs appear to be relatively unconcerned

with potential threats of hostile takeover bids, CEOs of state-owned banks exhibit a statistically significant lower degree of concern. This finding can be interpreted as a consequence of governmental discretionary and distortionary potential intervention in the market for banking corporate control (e.g., La Porta et al. 2002).

The differences in how external factors affect CEOs of *de novo* and established banks in terms of capital structure decisions are included in Table 9C.

The perceived effects of interest rate changes on debt/equity decision-making were more highly rated by the CEOs of *de novo* banks. CEOs of established banks rated it, on average, as significantly unimportant, mean score 2.0 (*p*-value, 0.0368).

Ownership in banking may have an idiosyncratic nature, among other factors, because of the dual role of government as residual claimant and economic and monetary policymaker.<sup>14</sup> Furthermore, politically motivated government intervention in management and governance conflicts may explain private dominance of state ownership in terms of financial behavior and performance (e.g., La Porta et al. 2002; Shirley and Walsh 2000).

**Table 9C**  
**Responses of CEOs of De Novo and CEOs of Established Banks to the question: “During your time as CEO, which of the following external factors has had the most important impact on the bank capital structure decisions?”**

Mean scores are based on a scale of 1 (least important) to 6 (most important).

<sup>+</sup>, <sup>++</sup>, denote a significant difference at the 5 and the 1 percent level for one-sided tests, respectively.

<sup>\*</sup>, <sup>\*\*</sup>, denote a significant difference at the 5 and the 1 percent level for two-sided tests, respectively.

	<i>De Novo</i> Banks	Established Banks
	Mean Scores	
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
Domestic 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 the income taxation of firms and investors	3.0	2.6
Legal restrictions on share repurchases	1.9	1.7
Interest rate changes	3.2	2.0*

<sup>14</sup> Under government ownership of banks, the monitoring and disciplinary roles of well-functioning competitive financial markets, and the market for corporate control may be hampered in performing those functions.

The literature documents empirical regularities consistent with the view that ownership matters in terms of capital structure (e.g., Margaritis and Psillaki 2010). For example, survey findings document that CEOs of privately-owned banks were significantly more concerned with shareholder value and capital market performance, than their state-owned counterparts. This evidence suggests that CEOs of state-owned and privately-owned banks may have, in line with previous research, different objective functions. Furthermore, the literature reports empirical regularities documenting changes in financial leverage policies, after transfers of state ownership over corporate assets to private investors (e.g., Megginson 2005; Sapienza 2004; La Porta 2002; Dewenter and Malatesta 2001; Shirley and Walsh 2000).

During the 1989-1998 survey period, CEOs of both state- and privately-owned banks coexisted in the Portuguese banking system (see Table 2). Moreover, the major banking reprivatization program involving 10 banks, almost one third of the thirty-three banks involved in the survey, was conducted between 1989 and 1996.<sup>15</sup>

We conjecture that preferences towards the different models of capital structure policy are likely to reflect differences in banking ownership structure. Therefore, to understand more clearly the preferences of state-owned and privately-owned banks concerning capital structure policy models, CEOs were asked to identify the prevailing intention in the bank capital structure decision-making, during their time in office.

**Table 10**  
**Responses of CEOs of ‘State-Owned’ and CEOs of ‘Privately-Owned’ Banks to the question: “During your time as CEO, please identify the prevailing objective in the bank’s strategic financing decision-making.”**

<sup>†</sup>, <sup>††</sup>, denote a significant difference at the 5 and the 1 percent level for one-sided tests, respectively.  
<sup>\*</sup>, <sup>\*\*</sup>, denote a significant difference at the 5 and the 1 percent level for two-sided tests, respectively.

	State-Owned Banks	Privately-Owned Banks
Follow a pre-determined set of guidelines on funding	60.0	19.4**
Achieve and sustain a target capital structure	13.3	2.8
Balance the economic costs and benefits of financing	13.3	50.0*
Maintain the historical financing pattern	0.0	2.8
Follow a hierarchy in using and exhausting available funding sources	13.3	25.0

Response items included, following a pre-determined set of funding, consistent with capital structure choice driven by blockholders’ incentives to tradeoff leverage benefits for control rights dilution associated with debt/equity issuance; achievement of a target leverage ratio and adoption of a capital structure by balancing the economic costs and benefits associated with financing, both proxying for the tradeoff capital structure; maintenance of the historical financing pattern followed by the bank, testing for the

<sup>15</sup> See Coutinho dos Santos (2003), for the schedule of the Portuguese banks reprivatization program.

neutral mutation hypothesis; and following a hierarchy in the usage and exhaustion of the available funding sources, the pecking order theory of capital structure.

A majority of 60 percent of CEOs of state-owned banks indicated that capital structure was decided based on following pre-determined guidelines on bank funding. The evidence supports the view that in the presence of managerial concentrated ownership, capital structure choices may be determined by a tradeoff between the dilution of control rights and the benefits of debt/equity issuance. Over 27 percent of the CEOs of state-owned banks indicated a preference for the capital structure standard static tradeoff model and 13.3 percent for the pecking order of financing.

Almost 53 percent of CEOs of privately-owned banks revealed a significant preference for the tradeoff capital structure policy model, 25 percent for the pecking order model, and 19.4 percent for a policy model trading off control rights and the benefits of capital structure choice.

The response item “maintaining the historical financing pattern”, surrogating for the neutral mutation hypothesis, failed to receive any preference from CEOs of state-owned banks and gathered the support of 2.8% of CEOs of privately-owned banks.<sup>16</sup>

To gauge the support for the market timing capital structure hypothesis, CEOs were questioned about the relevance of capital markets condition and stock price performance on the timing of new security issuances. A majority of 54.9 percent of the CEOs considered that capital market *momentum* was relevant for timing new security offerings, which is interpreted as consistent with the market timing theory.<sup>17</sup> Furthermore, CEOs were also asked to reveal the relevance they assigned to the influence of stock price performance on the timing of new debt or equity offerings. Approximately 55 percent of the CEOs considered as “somewhat relevant” or higher, the effect of stock price performance on the timing of new security issuances. A Z-test of a proportion indicates that the result is statistically significant at the 5 percent level (p-value: 0.0104). Thus, the null hypothesis that a majority of 50 percent of the CEOs does not time new security offerings to stock price performance could be rejected.<sup>18</sup>

Survey results on capital structure policy models suggest that CEOs of state-owned banks may be more concerned with government ownership discipline, whereas CEOs of privately-owned banks are more likely to be influenced by financial markets discipline, and therefore better aligned with the interests of their residual claimants. Overall, the evidence suggests that, even in the presence of government ownership of banks, as is the case of the Portuguese banking system, ownership does matter for capital structure choice.

<sup>16</sup> Overall CEOs interviewed assigned a 31.4 percent to the capital structure allocation of control rights model, 45.1 percent to tradeoff theory, 2.0 percent to the neutral mutation hypothesis, and 21.6 percent to the pecking order theory.

<sup>17</sup> The chi-square statistic suggests the presence of a significant relationship between capital market conditions and the timing of new equity and debt offerings (p-value: 0.00024). As the requirement for a chi-square approximation, under the hypothesis of independence, was not strictly met, this result should be interpreted cautiously.

<sup>18</sup> Furthermore, as documented in Table 9B, CEOs of privately owned and listed banks also elicited capital market performance as a significant determinant of capital structure decision-making.

## VI. Summary and Concluding Remarks

This paper provides field evidence gathered from face-to-face interviews whereby participants responded about the capital structure choices of Portuguese banks during the 1989-1998 period.

Survey findings document that the maximization of ROE and shareholders' returns, and the minimization of the cost of capital, are significant drivers underlying banking capital structure choices. Consequently, those choices are not random, as implied by Modigliani and Miller's (1958) irrelevance theorem but are consistent with the proposition that capital structure decisions matter for bank value.

Banking ownership structure prevailing among Portuguese banks is distant from the prototypical Berle and Means' (1932) diffusely and publicly held model, typically associated with conventional capital structure theory. Therefore, when drawing conclusions from our survey results, it should be taken into consideration that surveyed capital structure decision-making is likely to be affected by the incentive structure and governance control rights embedded in the different funding options.

Survey participants elicited ownership structure and managerial control, growth opportunities, reputation in banking markets, financial flexibility, signaling private information about banks' future performance prospects, bank size, share listing, business risk, dividend policy, and debt tax-shields as the most relevant capital structure determinants at the bank level. Changes in profitability, earnings dilution, non-debt tax-shields, stock price performance, and financial distress and bankruptcy risk received moderate to weak support from CEOs' responses.

Supervisory and regulatory discipline were indicated as influential external determinants for capital structure decision-making. The market for corporate control was not perceived as a meaningful disciplinary device, as takeover threats were not indicated as a concern, perhaps because of the potential intervention of the regulatory jurisdiction. Banking markets were not found to be effective mechanisms to discipline insiders' excessive risk-taking. The strong support received by the effect of the *too-big-to-fail* doctrine on capital structure suggests that managerial risk aversion induced by impending bankruptcy may be small.

Survey results are consistent with the hypothesis that banking capital structure is relevant in terms of valuation. They provide varying support for similar internal and external determinants that, arguably, influence the choice of corporate debt/equity funding mixes.

Findings on capital structure policy models reveal a significant preference for a policy of trading off ownership control rights dilution and the benefits of banks' strategic funding choices, followed by the static tradeoff model, and the pecking order of financing. The market-timing theory received moderate to weak preference from the survey participants.

Overall, our findings document that the CEOs interviewed are predominantly concerned with the influence of incentives associated with governance arrangements, and the control rights determined by banking/bank capital structure decision-making. Moreover, they allow an empirical link to be established with the corporate capital structure theory, suggesting that banking/bank capital structure choice may be

explained by the predictions of the corporate capital structure theory akin to non-banking corporations, taking into consideration the idiosyncrasies of their role as regulated financial intermediaries.

**Conflicts of Interest:** The author declares no conflict of interest.

## REFERENCES

- Akerlof, G. (2020). Sins of omission and the practice of economics. *Journal of Economic Literature*, 58(2), 405-418.
- Bancel, F., & Mittoo, U. (2004). Cross-country determinants of capital structure choice: a survey of European firms. *Financial Management*, 33(4), 103-132.
- Basel Committee on Banking Supervision. (2019). *The costs and benefits of bank capital – a review of the literature*. Bank for International Settlements Working Paper No. 37, Basle, Switzerland.
- Berger, A., DeYoung, R., Flannery, M., Lee, D., & Öztekin, Ö. (2008). How do large banking organizations manage their capital ratios? *Journal of Financial Services Research*, 34, 123-149.
- Berlin, M. (2011). Can we explain banks capital structures? Federal Reserve Bank of Philadelphia. *Business Review*, Q2, 1-11.
- Besanko, D., & Kanatas, G. (1996). The regulation of bank capital: do capital standards promote bank safety? *Journal of Financial Intermediation*, 5(2), 160-183.
- Bhandari, A., Birinci, S., McGrattan, E., & See, K. (2020). What do survey data tell us about US businesses? *American Economic Review: Insights*, 2(4), 443-458.
- Bharath, S., Pasquariello, P., & Wu, G. (2009). Does asymmetric information drive capital structure decisions? *Review of Financial Studies*, 22(8), 3211-3243.
- Bolton, P., & Scharfstein, D. (1990). A theory of predation based on agency problems in financial contracting. *American Economic Review*, 80(1), 93-106.
- Boot, A., & Thakor, A. (2011). Managerial autonomy, allocation of control rights, and optimal capital structure. *Review of Financial Studies*, 24(10), 3434-3485.
- Brewer III, E., Kaufman, G., & Wall, L. (2008). Bank capital ratios across countries: why do they vary? *Journal of Financial Services Research*, 34, 177-201.
- Brounen, D., de Jong, A., & Koedijk, K. (2004). Corporate finance in Europe: confronting theory with practice. *Financial Management*, 33(4), 71-101.
- Brounen, D., de Jong, A., & Koedijk, K. (2006). Capital structure policies in Europe: survey evidence. *Journal of Banking & Finance*, 30(5), 1409-1442
- Campello, M. (2003). Capital structure and product markets interactions: evidence from business cycles. *Journal of Financial Economics*, 68(3), 353-378.
- Canhoto, A., & Dermine, J. (2003). A note on banking efficiency in Portugal, new vs. old banks. *Journal of Banking and Finance*, 27(11), 2087-2098.
- Chung, K., & Smith II, R. (1987). Product quality, nonsalvage capital investment and the cost of financial leverage. In T. Copeland, Editor. *Modern Finance and Industrial Economics*, Chapter 9, 146-167. Basil Blackwell, New York (NY), USA.
- Cornett, M., & Tehranian, H. (1994). An examination of voluntary versus involuntary securities issuances by commercial banks: the impact of capital regulations on common stock returns. *Journal of Financial Economics*, 35(1), 99-122.
- Coutinho dos Santos, M., & Pacheco, L. (2006). Efeito nas cotações do anúncio de novas emissões de ações de bancos portugueses. *Cadernos do Mercado de Valores Mobiliários*, 24 (novembro), 242-255.
- Coutinho dos Santos, M. (2003). *Firm's capital structure decisions: theory and empirical evidence from Portuguese banks*. Unpublished Doctoral Thesis, University of Aveiro, Portugal.
- Cronqvist, H., & Nilsson, M. (2005). The choice between rights offerings and private equity placements. *Journal of Financial Economics*, 78, 375-407.

- D'Mello, R., & Farhat, R. (2008). A comparative analysis of proxies for an optimal leverage ratio. *Review of Financial Economics*, 17, 213-227.
- DeAngelo, H., & Stulz, R. (2015). Liquid-claim production, risk management, and bank capital structure: why high leverage is optimal for banks. *Journal of Financial Economics*, 116(2), 219-236.
- Demirgüç-Kunt, A., Detragiache, E., & Merrouche, O. (2013). Bank capital lessons from the financial crisis. *Journal of Money, Credit and Banking*, 45(6), 1147-1164.
- Demsetz, R., Saldenber, M., & Strahan, P. (1996). Banks with something to lose: the disciplinary role of franchise value. Federal Reserve Bank of New York. *Economic Policy Review*, October, 14 pages
- Dewenter, K., & Malatesta, P. (2001). State-owned and privately owned firms: an empirical analysis of profitability, leverage, and labor intensity. *American Economic Review*, 91(1), 320-334.
- De Jonghe, O., & Öztekin, Ö. 2015. Bank capital management: international evidence. *Journal of Financial Intermediation* 24: 154-177.
- DeYoung, R., & Hasan, I. (1998). The performance of de novo commercial banks: a profit efficiency approach. *Journal of Banking and Finance*, 22(5), 565-587.
- Diamond, D. & Rajan, R. (2000). A theory of bank capital. *Journal of Finance*, 55(6), 2431-2465.
- Dietrich, D., & Vollmer, U. (2004). *Why do banks hold capital in excess of regulatory requirements? A functional approach*. IWH Discussion Papers 192, Halle Institute for Economic Research.
- Dillman, D. (1978). *Mail and telephone surveys: the total design method*. New York, Wiley-Interscience.
- Ellul, A. (2009). Control motivations and capital structure decisions. *Social Science Research Network Electronic Journal*. DOI: <http://dx.doi.org/10.2139/ssrn.1364661>.
- Fama, E. & French, K. 1998. Taxes, Financing Decisions, and Firm Value. *Journal of Finance* 53(3): 819-843.
- Flannery, M., & Rangan, K. (2008). What caused the bank capital build-up of the 1990s? *Review of Finance*, 12 (2), 391-429.
- Flannery, M. (1994). Debt maturity and the deadweight cost of leverage: optimally financing banking firms. *American Economic Review*, 84(1), 320-331.
- Frank, M., & Goyal, V. (2009). Capital structure decisions: which factors are reliably important? *Financial Management*, 38(1), 1-37.
- Gao, W., & Zhu, F. (2015). Information asymmetry and capital structure around the world. *Pacific-Basin Finance Journal*, 32(C), 131-159.
- Graham, J., & Harvey, C. (2001). The theory and practice of corporate finance: evidence from the field. *Journal of Financial Economics*, 60(2-3), 187-243.
- Greenbaum, S., Thakor, A., & Boot, A. (2016). Bank capital structure. In *Contemporary Financial Intermediation*, 3<sup>rd</sup> Ed., Chapter 13, 317-327. Elsevier, Amsterdam, Netherlands.
- Gropp, R., & Heider, F. (2010). The determinants of bank capital structure. *Review of Finance*, 14(4), 587-622.
- Halov, N., & Heider, F. (2011). Capital structure, risk and asymmetric information. *Quarterly Journal of Finance*, 1(4), 767-809.
- Harding, J., Liang, X., & Ross, S. 2013. Bank capital requirements, capital structure and regulation. *Journal of Financial Services Research*, 43(2), 127-148.
- Harhoff, D., & Körting, T. (1998). Lending relationships in Germany - empirical evidence from survey data. *Journal of Banking and Finance*, 22(10-11), 1317-1353.

- Harris, M., & Raviv, A. (1991). The theory of capital structure. *Journal of Finance*, 46(1), 297-355.
- Hart, O., & Zingales, L. (2017). Companies should maximize shareholder welfare not market value. *Journal of Law, Finance, and Accounting*, 2, 247-274.
- Hoque, H., & Kashefi-Pour, E. (2018). Bank-level and country-level determinants of bank capital structure and funding sources. *International Journal of Finance & Economics*, 23(4), 504-532.
- Jensen, M., & Meckling, W. (1976). Theory of the firm: managerial behavior, agency costs, and ownership structure. *Journal of Financial Economics*, 3(4), 305-360.
- Jensen, M. (2010). Value maximization, stakeholder theory, and the corporate objective function. *Journal of Applied Corporate Finance*, 22(1), 32-42.
- Jensen, M., Fama, E., Long Jr., J., Ruback, R., Schwert, G., Smith Jr., C., & Warner, J. (1989). Editorial: clinical papers and their role in the development of financial economics. *Journal of Financial Economics*, 24(1), 3-6.
- Keeley, M. (1989). The stock price effects of bank holding company securities issuance. *Federal Reserve Bank of San Francisco Economic Review*, Winter, 3-19.
- Kwan, S. (2009). Capital structure in banking. *FRBSF Economic Letter*, Federal Reserve Bank of San Francisco 37(December) 1-4.
- La Porta, R., Lopez-De-Silanes, F., & Shleifer, A. (2002). Government ownership of banks. *Journal of Finance*, 57(1), 265-301.
- Leland, H., & Pyle, D. (1977). Information asymmetries, financial structure, and financial intermediation. *Journal of Finance*, 32(2), 371-387.
- Leland, H. (1998). Agency costs, risk management, and capital structure. *Journal of Finance*, 53(4), 1213-1243.
- Lemmon, M., & Zender, J. (2019). Asymmetric information, debt capacity, and capital structure. *Journal of Financial and Quantitative Analysis*, 54(1), 31-59.
- Lemmon, M., Roberts, M., & Zender, J. (2008). Back to the beginning: persistence and the cross-section of corporate capital structure. *Journal of Finance*, 63(4), 1575-1608.
- Mao, C. (2003). Interaction of debt agency problems and optimal capital structure: theory and evidence. *Journal of Financial and Quantitative Analysis*, 38(2), 399-423.
- Marcus, A. (1983). The bank capital decision: a time series-cross section analysis. *Journal of Finance*, 38(4), 1217-1232.
- Margaritis, D., & Psillaki, M. (2010). Capital structure, equity ownership and firm performance. *Journal of Banking & Finance*, 34(3), 621-632.
- Masulis, R. 1988. *The Debt/Equity Choice*. Ballinger Publishing Company, Pensacola (FL), USA.
- Meggison, W. (2005). The economics of bank privatization. *Journal of Banking & Finance*, 29(8-9), 1931-1980.
- Mehran, H., & Thakor, A. (2011). Bank capital and value in the cross-section. *Review of Financial Studies*, 24(4), 1019-1067.
- Mehrotra, V., Mikkelsen, W., & Partch, M. (2005). Do managers have capital structure targets? evidence from corporate spinoffs. *Journal of Applied Corporate Finance*, 17(1), 18-25.
- Miller, M. (1977). Debt and taxes. *Journal of Finance*, 32(2), 261-275.
- Miller, M. (1995). Do the M&M propositions apply to banks? *Journal of Banking and Finance*, 19(3-4), 483-489.
- Modigliani, F., & Miller, M. (1958). The cost of capital, corporate finance and the theory of investment. *American Economic Review*, 48(3), 261-297.
- Morellec, E., Nikolov, B., & Schürhoff, N. (2018). Agency conflicts around the world. *Review of Financial Studies*, 31(11), 4232-4287.
- Ogler, Y., & Taggart, R. (1983). Implications of corporate capital structure theory for banking institutions. *Journal of Money, Credit, and Banking*, 15(2), 212-221.

- Osterberg, W., & Thomson, J. (1996). Optimal financial structure and bank capital requirements: an empirical investigation. *Journal of Financial Services Research*, 10(4), 315-332.
- Peura, S., & Keppo, J. (2006). Optimal bank capital with costly recapitalization. *Journal of Business*, 79(2), 163-201.
- Prowse, S. (1997). Corporate control in commercial banks. *Journal of Financial Research*, 20(4), 509-527.
- Ross, S. (1977). The determination of financial structure: the incentive-signalling approach. *Bell Journal of Economics*, 8(1), 23-40.
- Santomero, A. & Watson, R. 1977. Determining an Optimal Capital Standard for the Banking Industry. *Journal of Finance* 32(4): 1267-1282
- Schepens, G. (2016). Taxes and bank capital structure. *Journal of Financial Economics*, 120(3), 585-600.
- Scholes, M., Wilson, P., & Wolfson, M. (1990). Tax planning, regulatory capital planning, and financial reporting strategy for commercial banks. *Review of Financial Studies*, 3(4), 625-650.
- Shirley, M., & Walsh, P. (2000). *Public versus private ownership: the current state of the debate*. World Bank Policy Research Working Paper No. 2420.
- Simon, H. (1997). *An empirically based microeconomics*. Cambridge University Press, Cambridge, UK.
- Tufano, P. (2001). HBS-JFE conference volume: complementary research methods. *Journal of Financial Economics*, 60(2-3), 179-185.
- Wall, L., & Peterson, P. (1998). The choice of capital instruments. *Federal Reserve Bank of Atlanta Economic Review*, (Second Quarter), 4-17.
- Welch, I. 2011. Two Common Problems in Capital Structure Research: The Financial- Debt-To-Asset Ratio and Issuing Activity Versus Leverage Changes. *International Review of Finance* 11(1): 1-17.
- Welch, I. 2006. *Common Flaws in Empirical Capital Structure Research*. Available at SSRN: <http://ssrn.com/abstract=931675>.

