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Do stakeholders matter for corporate governance? Behavior and performance of Norwegian banks 1985-2002

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NORWEGIAN SCHOOL
OF MANAGEMENT

Preface

The issue

The distribution of formal control rights among the firm's stakeholders (such as stockholders, creditors, employees, politicians, and customers) attracts considerable public attention in many countries. For instance, a common view in the UK and the US is that firms should have profit maximization as their only objective, and that stockholders should be the dominant stakeholder in corporate governance. In contrast, conventional wisdom in Continental Europe and Japan is that firms should have multiple objectives and allocate formal power to more stakeholder types than just stockholders. The politics of corporate governance addresses this issue by regulating the owners' ability to control the corporation.

This report addresses this issue empirically by trying to answer two questions. First, what relationship do we actually observe between stakeholder structure and corporate behavior? For instance, do firms take less risk when stockholders share control rights with employees, customers, and politicians? Second, what is the real-world link between stakeholder structure and economic performance? For instance, do ownerless firms have lower returns to capital invested than firms owned by stockholders?

The sample

We use firm-level data from the population of Norwegian banks over the period 1985-2002. These firms have widely different stakeholder structures in terms of how voting rights and cash flow rights are distributed between stockholders, employees, customers, and politicians. A commercial bank (*forretningsbank*) has profit maximization as its goal, stockholders have all the cash flow rights, and stockholders control the board. In contrast, no stakeholder has any cash flow right in the ownerless savings bank (*sparebank*), which has multiple objectives and voting rights shared by employees, customers, and politicians. The third type, which we call PCC bank (*grunnfondsbank*), is partly an ownerless, pure savings bank controlled by non-owner stakeholders without cash flow rights, partly a pure stock company controlled by stockholders with full cash flow rights.

Predictions and findings

Due to the difference in stakeholder structures, we predict that compared to commercial banks, ownerless savings banks will (i) be less risky, (ii) be smaller, charge higher prices, and grow less, and (iii) be less profitable. The corresponding characteristics of PCC banks will fall somewhere in between the two pure types.

Consistent with the first two predictions, we find that compared to owner-controlled commercial banks, ownerless savings banks (i) have less risky balance sheets. Moreover, they (ii) are smaller and price their products less aggressively, although the growth rates are not significantly different. Such behaviour is as expected when stakeholders use their control rights to make the firm behave in ways they prefer.

Inconsistent with hypothesis (iii), however, we find that commercial banks do not outperform ownerless savings banks in economic terms. In fact, commercial banks

sometimes underperform significantly, both statistically and economically. Thus, ownerless firms with multiple objectives perform at least as well as profit-oriented firms owned by stockholders. This finding questions the critical role of owners posited by agency theory, but supports the idea that the disciplining effect of product market competition substitutes for ownership. The evidence also suggests that stockholders may benefit economically from internalizing welfare effects of their actions on other stakeholders, such as employees, customers, and the local community.

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1. Introduction

The distribution of control rights among the firm's stakeholders attracts considerable public attention in many countries. For instance, a common view in the UK and the US is that firms should have long-term profit maximization as their objective, and that stockholders should be the dominant stakeholder in corporate governance (Macey and O'Hara, 2003). In contrast, conventional wisdom in Continental Europe and Japan is that firms should have multiple goals and allocate formal power to more stakeholder types than just stockholders (Allen et al., 2006). The politics of corporate governance addresses these concerns through regulatory restrictions on the stockholders' ability to control the corporation, such as laws and codes on management's fiduciary duties, independence and diversity in the boardroom, and the control rights of employees.

Our paper addresses the stakeholder issue empirically by trying to answer two questions. First, what relationship is actually observed between stakeholder structure and corporate behavior? For instance, do firms take less risk when stockholders share control rights with employees, customers, and politicians? Second, what is the real-world link between stakeholder structure and economic performance? For instance, do ownerless firms have lower returns to capital invested than firms owned by stockholders? We answer these two questions using firm-level data from the population of Norwegian banks over the period 1985-2002. These firms differ widely in how formal power is distributed between owners, employees, customers, and the local community. For instance, one firm type has profit maximization as its goal, stockholders have all the residual cash flow rights, and stockholders control the board. In contrast, no stakeholder has cash flow rights in the ownerless firm type, which has multiple objectives and voting rights shared by employees, customers, and politicians.

Hansmann (1996) provides a useful theoretical framework for understanding how stakeholder structures drive organizational design. However, this issue is remarkably underexplored empirically. First, the focus is not on how stakeholder structure relates to economic performance, but how it relates to behavioral characteristics, such as productive efficiency (Mester, 1991), pricing strategy (Ashton and Letza, 2003; Cummins et al, 2004), risk taking behavior (Esty, 1997a, 1997b), cost minimization (Mester, 1989), and corporate governance activity (Crespi et al, 2004). Second, the stakeholder structures of the analyzed firms have been quite homogenous. For instance, with only one exception (Crespi et al, 2004), all firms have at least one stakeholder type with both cash flow rights and voting rights, such as equity investors in regular stock companies, depositors in S&Ls, policy-holders in insurance mutuals, and producers in cooperatives. Thus, this literature has barely addressed ownerless firms, which according to Hansmann (1996) are firms where no stakeholder has residual cash flow rights, being "barred from distributing any profits to its members, officers, directors or trustees" (Hansmann, 1996, p. 228). It seems difficult to determine whether ownership is critical for economic organization unless one can compare owned firms to ownerless firms.

We study how organizational form relates to behavior and performance in a sample that includes extreme combinations of corporate objectives and owner control, and which all operate in the same product market and the same regulatory regime. This large heterogeneity in the determinant of interest and the large homogeneity in other determinants increase the power of our tests. In particular, if the key to economic success involves profit maximization as a goal and stockholder control as a governance mechanism, this should at least show up as performance differences between firms that operate in the same environment, but that represent the largest possible difference in objectives and owner control.

The first firm type is pure savings banks (*sparebank*), which are ownerless foundations controlled by depositors, employees, and the local government.¹ Thus, these are not collectively owned mutuals, but genuinely ownerless enterprises where no stakeholder has cash flow rights. The second type is commercial banks (*forretningsbank*), which are pure stock companies owned and controlled by stockholders and listed on the stock exchange. The third type, which we call PCC bank (*grunnfondsbank*), is a mixture of the two pure types. A PCC bank has voluntarily transformed itself from a pure savings bank (hereafter non-PCC bank) into a hybrid form by issuing primary capital certificates (hence PCC). These contracts are equity securities held by the general public and are normally listed. Thus, a PCC bank is partly an ownerless, pure savings bank controlled by non-owner stakeholders without cash flow rights, partly a pure stock company controlled by stockholders with full cash flow rights.

Given these differences in stakeholder structure, it is not surprising that the shape of the objective function varies across the three organizational forms. Commercial banks have profit maximization as their goal, whereas non-PCC banks have multiple goals.² PCC banks also have multiple goals, but the objective function is different than in non-PCC banks because PCC banks also have stockholders with cash flow rights and voting rights.

The literature gives some hints as to how our sample firms may behave and perform. First, economic theory shows that the combination of profit maximization and stockholder control is Pareto optimal in a competitive equilibrium, provided security markets are perfect and complete, information is symmetric, and agency costs are zero. Second, introducing imperfections into this idealized Arrow-Debreu economy means that theory has considerably less to say about efficient combinations of corporate objectives and corporate governance. Ignoring the question of Pareto optimality and assuming zero agency costs, Allen et al. (2006) show that shareholder concern for other objectives than profit maximization will influence the firm's behaviour. For instance, firms with controlling stockholders who start internalizing their employee's private layoff costs in the firm's objective function will change behaviour in equilibrium by taking on less risk, producing less output, and charging higher prices. Third, extant bank research (Karceski et al (2005) is a recent example) has shown theoretically and empirically that information asymmetry between lenders and borrowers makes banking relationships valuable for customers beyond the value of a single transaction. Thus, terminating a banking relationship and starting a new one is costly, particularly for small firms. Also, growing banks tend to reduce the supply of funds available to small firms.

This suggests that in our context, local authorities protecting the local economy and bank customers protecting their banking relationship will use their control rights to influence the strategy of savings banks in general and of non-PCC banks in particular. This will materialize itself as a pressure on management to choose a low risk strategy in order to avoid bank distress, and to go for modest growth that enables local, small businesses to keep their bank relationship. According to Allen et

¹ This organizational form is similar to mutual savings banks in the US, which are ownerless foundations established for the first time in 1816. They should not be confused with S&Ls, which are consumer cooperatives owned by their depositors (Hansmann, 1996, pp. 246-252).

² Other goals include promoting saving in society and offering bank services to as many citizens as possible. Savings banks also distribute part of their earnings for social purposes. Non-PCCs (PCCs) allocated 4% (1%) of net income to gifts over the sample period. We do not have the corresponding figure for commercial banks, but we believe they allocate substantially less than savings banks.

al, 2006), the tendency for stakeholder-oriented firms to charge higher prices will also produce higher interest margins in savings banks than in commercial banks. Thus, the bank's stakeholder structure will influence the characteristics of the income statement as well as the composition and dynamics of the balance sheet. As for performance, the agency logic suggests that commercial banks will produce higher average returns for a given risk than savings banks. This is because owners have a valuable monitoring role and because concern for non-owner objectives is costly for the owners.

On this background, we conjecture that compared to commercial banks, ownerless savings banks will (i) be less risky, (ii) be smaller, charge higher prices, and grow less, and (iii) be less profitable. The corresponding characteristics of PCC banks will fall somewhere in between the two pure types. Consistent with the first two predictions, we find that compared to owner-controlled commercial banks, ownerless savings banks (i) have less risky balance sheets. Moreover, they (ii) are smaller and price their products less aggressively, although the growth rates are not significantly different.

Inconsistent with prediction (iii), we find that commercial banks do not outperform ownerless savings banks in economic terms.³ In fact, commercial banks sometimes underperform significantly, both in statistical and economic terms. This puzzling result does not imply that shareholders produce no value beyond just providing financing. However, it does suggest that owners are redundant in the sense that ownership is not an irreplaceable corporate governance mechanism. Other mechanisms do the job at least as efficiently. In particular, successful ownerless firms have disciplining mechanisms that substitute for the monitoring and advice functions of capital providers. These mechanisms are endogenous responses to exogenous factors in the firm's environment.

Three exogenous factors seem particularly relevant. First, the public banking supervisor monitors all banks according to the same rules on a regular basis. However, banking supervisors barely fill the role of monitoring stockholders because they focus on limiting downside risk rather than encouraging maximum value creation. A second factor is that although there is no owner to monitor managers of a non-PCC bank, management cannot easily overinvest. This is because an ownerless bank cannot raise outside equity. We find no evidence supporting this explanation. Moreover, even if we had found such evidence, which suggest the agency problem is taken care of by the capital constraint, this cannot explain why multiple-objective firms still make at least as profitable investments as firms with profit-maximization as the single goal. Thus, even if non-PCC banks were capital constrained in ways that prevented investment in projects with negative NPV for stockholders, why would their managers use the restricted equity on projects with the most positive NPV?

This question brings us to the third exogenous disciplining device, which is the need to perform well when product markets are competitive. The logic is simply that regardless of how control rights are distributed, only efficient firms survive in competitive markets (Machlup, 1967; Scharfstein, 1988; Schmidt, 1997). We provide some evidence that this is the more probable explanation for our finding. That is, firms without owners survive in markets when they respond to competitive pressure in ways they would have done in a market with less competition, but with monitoring owners. Active ownership and strong competition are substitute governance mechanisms.

³ As expected, the hybrid PCC banks fall in between the two pure types on both behavior and performance.

Finally, the three bank types have coexisted in our sample over extended periods of time. This may suggest there is no universally dominant type and that the value of ownership relative to other ways of organizing enterprise depends on a wider set of stakeholder, firm, and market characteristics than those explored in our project. In fact, the theoretical literature surveyed by Hansmann (1996) shows that ownerless firms may be both sustainable and optimal, that viable owned firms may have an ownership structure that does not involve the firm's capital providers at all, and that ownership by other stakeholders such as customers and employees is more efficient the stronger the firm's market power over these stakeholders, the more firm-specific the human capital, and the less symmetric the information between the parties.

We conclude that the stakeholder structure drives the firm's behavior in the direction predicted by theory and existing empirical evidence. In contrast, the observed relationship between stakeholder structure and economic performance is inconsistent with agency theory. This suggests there is a serious challenger to the classic organizational form of enterprise assigning the control rights to stockholders in profit-maximizing firms. Neither one-dimensional profit-maximization nor the stockholders' monitoring of management seems critical for value creation. As for objectives, Allen et al. (2006) show formally that in a model without agency costs, the return to capital invested may increase when controlling shareholders voluntarily let the firm's objective function reflect the welfare of non-capitalist stakeholders, such as customers and employees. As for monitoring, an open question we leave for the theorist is whether the Allen et al. result still holds with agency conflicts.

The rest of this report is organized as follows. Section 2 reviews the literature and presents our predictions, and the third section describes the data set and the overall development of the Norwegian banking industry during the sample period 1985-2002. We analyze the banks' behavior in section 4, whereas economic performance is explored in section 5. Summary and conclusions follow in section 6. Supplementary tables are provided in the appendix.

2. Theory

According to the theory of the firm, the distribution of control rights may influence the firm's behavior and performance both through its objective function and its corporate governance system. The objective function channel is evident when multiple stakeholder types share the control rights. For instance, employee directors may be more willing than shareholder directors to sacrifice profits in order to increase job security. Even when all control rights belong to one stakeholder type, however, such as the shareholders in most corporations, the objective function will depend on how the controlling stakeholder handles externalities faced by other stakeholders. For instance, ethical mutual funds may focus more than other stockholders on whether the firm they own is employing, producing, and pricing in socially acceptable ways.

The firm's governance system is considered particularly important when control rights are delegated to management. The principal-agent paradigm argues that firms in competitive markets will underperform and eventually disappear unless they have monitors who actively discipline opportunistic managers in ways that foster economic efficiency. According to this logic, owners matter not only because they finance the investments. Stockholders who delegate control can also monitor management and thereby ensure they make decisions that maximize the value of the capital supplied. Hence, monitoring is considered a valuable corporate governance mechanism, and firms where stockholders have weak control rights are disadvantaged compared to firms where stockholders are stronger. Moreover, the agency framework suggests that conflicts of interest between stakeholder types will produce lower returns to capital invested in firms with multiple objectives than in firms with profit maximization as the only goal.

Tirole (2001) takes the agency model one step further by keeping the separation between ownership and control, but allowing for multiple stakeholder types. Thus, power may not only reside with owners and managers, but also with customers, employees, politicians, and society at large. This means the firm's objective function may reflect the preferences of several stakeholder types. In such a context, maximization of returns to capital invested may no longer be the dominating concern, monitoring by owners may be a less critical governance mechanism, and ownerless firms may survive.

Table 1 shows how control (voting) rights and cash flow rights are distributed among the four stakeholder types in our sample firms. The non-PCC bank has a committee of representatives with members appointed by the employees (25% of the votes), depositors (37.5%), and local authorities (37.5%). This committee elects the board, and the two bodies jointly hire and fire the CEO. Since no stakeholder has cash flow rights, this is genuinely an ownerless firm. In contrast, commercial banks have owners who write the corporate charter, elect two thirds of the firm's directors in the stockholder meeting, and have a 100% claim on the residual cash flow.⁴ Finally, holders of PCC securities are owners, but have only a fractional claim on the residual cash flow corresponding to their share of the bank's equity, which varies between 5% and 90%. Their voting right is 25% by law, which means they elect 25% of the committee of representatives. In every other respect, PCC securities give the same ownership rights as regular shares. Notice, however, that because the PCC capital is

⁴ Commercial banks with more than 200 employees are required by law to have one third of their directors elected by and among the firm's employees. All commercial banks in our sample have more than 200 employees.

senior to the remaining, ownerless equity, PCC securities are less risky than the equity of an otherwise identical commercial bank.

Table 1: Control rights and cash flow rights across stakeholder types

Bank type	Control right, %				Cash flow right, %
	Stock-holders	Employees	Depositors	Community	
Non-PCC	0	25	37.5	37.5	Nobody
PCC	25	25	25	25	Stockholders: 5-90
Commercial	67	33	0	0	Stockholders: 100

The table shows the distribution of control rights and cash flow rights in Norwegian non-PCC banks, PCC banks, and commercial banks. Non-PCC banks are ownerless foundations (pure savings banks). PCC banks used to be pure savings banks that later transformed themselves into PCC banks by issuing equity securities to the general public in terms of Primary Capital Certificates (PCC).

Our sample consists of banks that operate in the same product market, are exposed to the same regulatory regime, and are monitored by the same public banking inspector (*Kreditilsynet*). Because monitoring is assumed to be valuable and because of the assumed tradeoff between the interests of owners and other stakeholders, the agency perspective predicts that economic performance is lower the weaker the owners' control rights and the more multi-faceted the firm's objective function. Thus, commercial banks will perform best economically, non-PCC banks the least, and PCC banks will fall somewhere in between.

Although Allen et al. (2006) ignore the agency problem, they challenge the idea that owners necessarily lose wealth if they internalize other stakeholders' private disutility caused by the firm's actions, such as search costs for new jobs after a corporate bankruptcy. They show formally that such a stakeholder policy may even increase the value of the firm. The mechanism by which this happens is that multiple-objective firms soften competition by charging higher prices and producing less volume in equilibrium.⁵ This positive firm value effect comes more easily if regulation dictates social responsibility for all firms (such as mandating employee directors) or if consumers are willing to pay more for products from socially responsible firms (such as firms that downsize less in recessions).

In our setting, the Allen et al. (2006) model suggests that compared to commercial banks, ownerless non-PCC banks will reduce the externalities of financial distress by taking on less risk, with PCC banks in between. We will see shortly that the banking literature has made the same predictions and found supporting evidence in similar contexts.⁶ However, only Allen et al. (2006) predict that the return to

⁵ Since consumers are paying the bill in terms of higher prices, a stakeholder society is not necessarily Pareto optimal. Allen et al. (2006) do not address that question.

⁶ The risk argument can also be based on the options pricing model (Black and Scholes, 1973), which implies that because equity in a leveraged firm is a call option on the underlying assets, higher asset volatility increases the value of equity at the expense of other claimholders. Therefore, unlike non-PCC banks, a commercial bank may act in its owners' best interest by increasing the volatility of its cash

capital invested may increase if the firm puts more weight on the preferences of non-owner stakeholders. This difference may be due to the fact that Allen et al. ignore costly separation between ownership and control. In fact, Tirole (2001) argues that the major governance problem for owners of multiple objective firms is not to trade off the interest of multiple stakeholder types *ex ante*, but to assess decision quality *ex post*. Managers of multiple-objective firms can always argue that although profits was mediocre compared to profit-maximizing competitors, the score was better on objectives that are expensive to fulfill and hard to evaluate, such as social responsibility. We try to shed light on the seriousness of ignoring this monitoring problem by testing the predictive power rather than the descriptive accuracy of the agency model versus the Allen et al. (2006) model.

The banking literature offers several insights into how behavior will differ across our bank types in terms of observable characteristics like growth, size, and risk taking. Banking relationships are valuable for the bank's customers and particularly for small start-up firms with limited access to alternative sources of debt financing. This has been shown both theoretically (Campbell, 1979; Fama, 1985; Diamond, 1991; Rajan, 1992; Boot and Thakor, 1994; von Thadden, 1995; Bhattacharya and Chiesa, 1995; Yosha, 1995) and empirically (Slovin et al, 1993; Hubbard et al., 1999; Ongena et al., 2003). Moreover, Karceski et al. (2005) document that customers may be adversely affected not only when a bank is insolvent, but also when it merges or is taken over. Berger and Udell (1996) and Peek and Rosengren (1996) show that as banks grow through consolidation, they tend to reduce the supply of loans to small businesses.⁷ Finally, Stein (2002) provides a theoretical explanation for a size effect in lending, where large banks lend to large firms and small banks lend to small firms in equilibrium.

Overall, the banking literature suggests that certain customers will benefit from dealing with large banks, whereas others will suffer when their bank is big, grows fast, merges, or faces financial distress.⁸ Moreover, a bank's assets and

flow and not simultaneously rewriting the contract with its non-owner stakeholders. Notice, however, that although Allen et al. (2006) make the same prediction, the reason is the opposite: Stakeholder oriented banks are less risky not because other stakeholders than owners are in control, but because controlling owners find it beneficial for the value of their own claim to have low risk.

⁷ However, Strahan and Weston (1998) and Berger et al. (1998) show that the supply of funds for small businesses may not decrease after a bank merger, provided competing, smaller banks are ready to fill the gap.

⁸ These arguments are also plausible reason why three different organizational forms coexist in our sample. According to the classic view, coexistence is infeasible, as the superior organisational form will crowd out the others. In some industries, however, the customer value of the product depends on the survival of the supplier after the purchase. This value is particularly relevant in the financial industry, where switching costs will make some customers benefit more than others from a bank with smaller default risk, lower chance of being taken over, smaller size, and slower growth. These characteristics correspond to those of ownerless savings banks as opposed to commercial banks in our sample. However, the control right in savings banks is illiquid, since it is tied to the customer status. Customers must be compensated for this illiquidity, and Remmers (2003) hypothesizes that the cost of capital will be higher in savings banks than commercial banks.

On the other hand, a commercial bank is problematic for the customer because its owners have post-contract incentives to increase the risk at their customers' expense. In order to induce customers to still purchase their product, owners in the Remmers model contract with the manager to limit the bank's risk taking. Hence, unlike savings banks, commercial banks incur contracting costs between owners and managers. For the same reason, commercial banks must offer lower prices.

Thus, Remmers predicts that coexistence may exist in equilibrium. Compared to owner-controlled banks, banks with weaker owner control will have lower contracting costs, higher costs of capital, and charge higher prices.

liabilities are unusually liquid because they can be shifted substantially over a short time period at low adjustment costs. Thus, Esty (1997a) argues that differences in stakeholder structure will make balance sheets differ both across bank types and also within the same bank over time. Esty (1997b) documents that when his sample of depositor-owned S&Ls in the US convert to stockholder-owned commercial banks, their asset and liability structures change considerably. In particular, banks grow faster and take on more risk after having transformed to a stockholder-owned type.

Summarizing, we conjecture that compared to commercial banks, ownerless savings banks have less risk, are smaller, and grow more slowly. PCC banks are somewhere in between the two pure types. In an agency setting, risk-adjusted returns to capital invested will be lowest in ownerless banks, highest in commercial banks, with PCC banks in between. If the corporate governance problem is better handled by firms with multiple objectives and by other disciplining mechanisms than monitoring stockholders, performance is no longer positively related to the fraction of control rights and cash flow rights held by stockholders.

3. The Norwegian banking industry

The first Norwegian savings bank was established in 1822, while the first commercial bank was founded in 1848. Regulation introduced in 1985 opened up for PCC banks, and the first such bank was established in 1988 when a pure savings bank (non-PCC bank) chose to become a PCC bank.

Our data set includes every Norwegian savings bank (non-PCC and PCC) and all listed Norwegian commercial banks from 1985 to 2002.⁹ There are 2668 firm years altogether, of which 2288, 214, and 166 are for non-PCC banks, PCC banks, and commercial banks, respectively.¹⁰ As shown by table 2, there is a monotonic decline in the total number of banks, commercial banks, savings banks as a group (non-PCC banks plus PCC banks) and non-PCC banks. For instance, the number of non-PCC banks and commercial banks drops from 191 to 103 and from 15 to 2, respectively. The opposite pattern is evident for PCC banks, as the number increases from 3 in 1988 to 24 in 2002. From 1994 on, there are more PCC banks than commercial banks.

Norwegian banks went through a systemic crisis in the period 1988-1992 (Moe et al. (2004) provide a review). The first bank failure occurred in the fall of 1988, and 13 small and medium sized banks failed in 1988-1990.¹¹ By the end of 1990 large commercial banks were in trouble as well. The government established a bank insurance fund to finance distressed banks. To qualify for government support, strict criteria had to be met which sometimes involved a write-off of the existing share capital. This system brought the three largest Norwegian commercial banks under full state ownership in 1992.

The banking industry regained profitability in 1993, and the state gradually reduced its ownership. By the end of our sample period, the state held a minority stake (47.8%) in the largest commercial bank and had sold all their shares in the two others.¹²

⁹ Unlisted commercial banks are either operating as independent units (like the former Postbanken), as part of a financial conglomerate (like Storebrand Bank), or as a subsidiary of a multinational banking group (like Handelsbanken).

¹⁰ Accounting data for commercial banks and stock market data for commercial banks and PCC banks was collected in electronic form from Oslo Børs Informasjon, which is the information provider of the Oslo Stock Exchange. Accounting data for non-PCC banks and PCC banks was obtained from Sparebankenes Sikringsfond, to which all savings banks must report their annual accounting figures once a year. We received these data electronically for 1987-1991 and for 1995-2002, while we collected data from printouts provided by Sparebankenes Sikringsfond for the remaining years (1985-1986, 1992-1994). These printouts were scanned electronically and then verified manually.

¹¹ Nine savings banks and two commercial banks received guarantees from the banks' insurance funds and were forced to merge with solvent banks. One merged savings bank received government support through loans and debt write-offs from the central bank. One commercial bank (Norion Bank) was allowed to liquidate, but all depositors' claims were covered.

¹² Table 1 document that our sample period contains two consolidation periods for commercial banks. The number of such banks dropped around 1990 and again just before 2000. In the former period struggling banks merged or were acquired by solvent banks during the systemic crisis (DnC merged with Bergens Bank, whereas Sunnmørsbanken and Sørlandsbanken were acquired by CBK) In the latter period some banks were acquired by or merged into multinational financial groups (for instance, CBK merged into Nordea, which is a pan-Nordic financial conglomerate, Fokus was acquired by Danske Bank, which is Danish, and Bergens Skillingsbank was acquired by the Swedish bank Handelsbanken). Other banks were involved in domestic M&As (e.g., Finansbanken was acquired by Storebrand, which is a Norwegian insurance company moving into banking). The savings bank industry has been consolidating more gradually.

The declining number of banks in table 1 reflects the growing industry concentration among Norwegian banks over time. The Herfindahl index of total assets rises from 8% to 18% for the sector as

Table 2: The number of Norwegian banks over the period 1985-2002

Year	All banks	Commercial banks	Savings banks			Listed PCC
			All	Non-PCC	PCC	
1985	206	15	191	191		
1986	206	16	190	190		
1987	172	13	159	159		
1988	173	14	159	156	3	0
1989	158	14	144	137	7	4
1990	154	10	144	137	7	3
1991	147	11	136	128	8	4
1992	145	11	134	125	9	4
1993	142	10	132	124	8	4
1994	141	9	132	122	10	8
1995	140	8	132	118	14	12
1996	141	8	133	117	16	13
1997	137	7	130	114	16	14
1998	137	7	130	109	21	19
1999	134	4	130	107	23	20
2000	135	4	131	107	24	22
2001	132	3	129	105	24	22
2002	129	2	127	103	24	22

The table shows the total number of Norwegian banks (All banks), the number of listed commercial banks, savings banks (All, non-PCC banks and PCC banks), and listed PCC banks. Non-PCC banks are ownerless foundations (pure savings banks). PCC banks used to be pure savings banks that later transformed themselves into PCC banks by issuing equity securities to the general public in terms of Primary Capital Certificates (PCC). The first PCC bank was established in 1988.

Table 3 shows total bank assets across organizational form over the years. Non-PCC savings bank assets declined sharply in 1988. This drop was not primarily because of the crisis, but because three rather large savings banks issued PCC securities. As more banks converted, non-PCC assets continued declining to a bottom of NOK118 billion in 1995. Since then, there has been a steady growth to NOK182 billion in 2002, which reflects a real, annual growth of 6% in this most current seven-year period.

a whole, from 6% to 14% for savings banks, and from 21% to 85% for commercial banks. Since this period experienced a significant influx of foreign banks into the Norwegian market, the declining number of nationally domiciled banks does not necessarily imply that competition in the banking market was declining.

Table 3: The size of the Norwegian banking industry

Year	All banks	Commercial banks	Savings banks		
			All	Non-PCC	PCC
1985	653	376	276	276	
1986	782	471	311	311	
1987	951	542	409	409	
1988	925	537	388	259	129
1989	928	579	348	199	149
1990	925	589	336	197	139
1991	858	551	307	143	164
1992	816	517	299	134	165
1993	775	469	307	138	169
1994	776	456	320	121	199
1995	792	456	336	118	219
1996	921	549	372	124	248
1997	996	585	411	133	278
1998	1051	603	448	131	317
1999	1147	619	528	138	389
2000	1258	665	593	159	434
2001	1083	440	642	169	473
2002	1113	432	680	182	499
Average	931	524	406	186	265

We measure size by the book value of assets in constant billion NOK as of 2002. One NOK is approximately 0.15 Euros. Average size in the bottom row is based on the pooled sample. Non-PCC banks are ownerless foundations (pure savings banks). PCC banks used to be pure savings banks that later transformed themselves into PCC banks by issuing equity securities to the general public in terms of Primary Capital Certificates (PCC).

PCC asset totaled NOK185 billion in the introduction year of 1988. Except for one small decline in the crisis year 1990, there has been a steady, annual growth of 11% per year from NOK139 billion in 1990 to NOK499 billion in 2002. The commercial bank sector grew until 1990, thereafter declining to its minimum in 1994 as a result of the banking crisis. The subsequent growth period reached a top in 2000 with NOK665 billion, after a 6.5 % annual growth.¹³

Comparing the relative size of the three organizational forms, table 3 reveals that although the commercial bank sector is largest in the beginning of the sample period and the savings bank sector is largest in the end, the overall market share of the two in terms of total assets is still fairly equal over the sample period. There is a strong tendency within the savings banks sector for the non-PCCs to lose market share to the PCCs. For instance, whereas assets in PCCs were just half the assets in non-PCCs in 1988, PCC assets were almost three times higher in 2002.

¹³ When CBK was acquired by the international bank Nordea in 2001, one third of commercial bank assets left our sample.

Internationally, it turns out that Germany (Krahn and Schmidt, 2004) and Spain (Crespi et al, 2004) are the two other European countries where savings banks have a prevalent position, accounting for roughly half of total bank assets. However, important differences exist. German savings banks are owned by local governments, only Norway and Spain have ownerless savings banks (non-PCCs), and only Norway has PCC banks.

Allen et al. (2006) predict that stakeholder firms (non-PCC and PCC banks in our context) will compete more softly than shareholder firms (commercial banks). Figure 1 shows that interest rates offered on deposits by the banks in our sample do not differ noticeably between bank types. However, the table also documents that lending rates are higher in savings banks.¹⁴ Thus, the interest rate margin (lending rate minus savings rate) is higher in stakeholder-oriented firms, which is consistent with the Allen et al. prediction.

Allen et al. also hypothesize that as some firms switch from a stakeholder structure towards more concern for stockholders, competition will be tougher, and prices will fall. Figure 2 suggests that this may have happened in our sample as non-PCC banks became PCC banks. The average interest rate margin is steadily decreasing over the period, independently of the general level of interest rates. There are several competing explanations, like technology improvement, better price transparency, and increased competition from foreign and domestic entrants.¹⁵ Still, we cannot rule out the effect on interest rates of a shift from broader stakeholder concerns to a narrower stockholder focus. Unfortunately, we do not have pricing data at the individual bank level to investigate the pricing issue more formally.

¹⁴ One explanation might be that since savings banks are smaller, they offer smaller loans that in general are more expensive only due fixed handling costs, and not to any difference in pricing policy.

¹⁵ Internet banking was introduced towards the end of the sample period with the first pure internet bank (Skandiabanken) opening in 2000. Comparative surveys of lending and deposit rates appeared in the media early in the sample period, and foreign banks started entering the Norwegian market around the same time.

Figure 1: Interest rates on home building loans and ordinary deposits offered by Norwegian banks 1992-2002

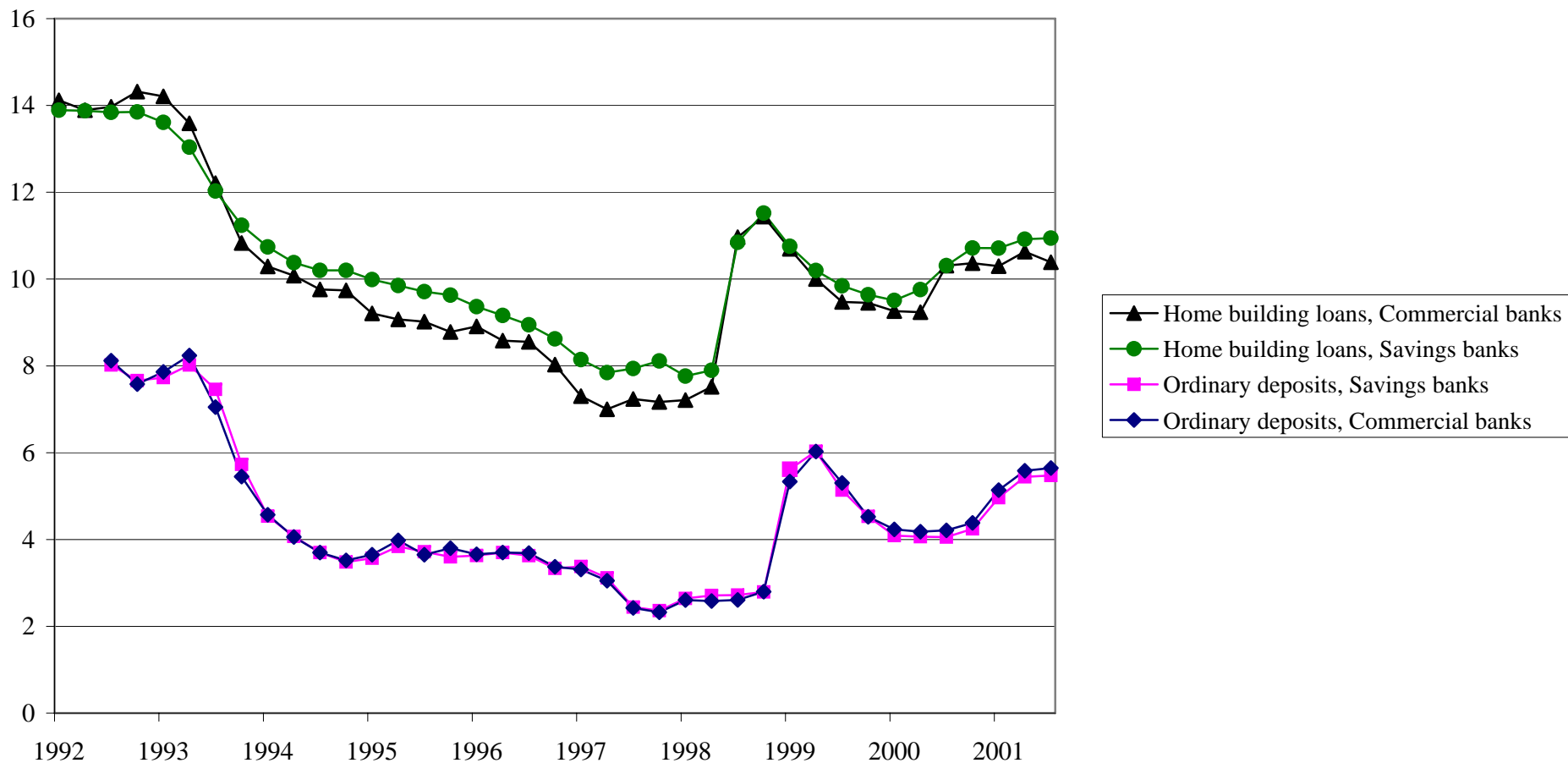


Figure 2: Interest rate level and interest rate margin in Norwegian banks 1985-2005

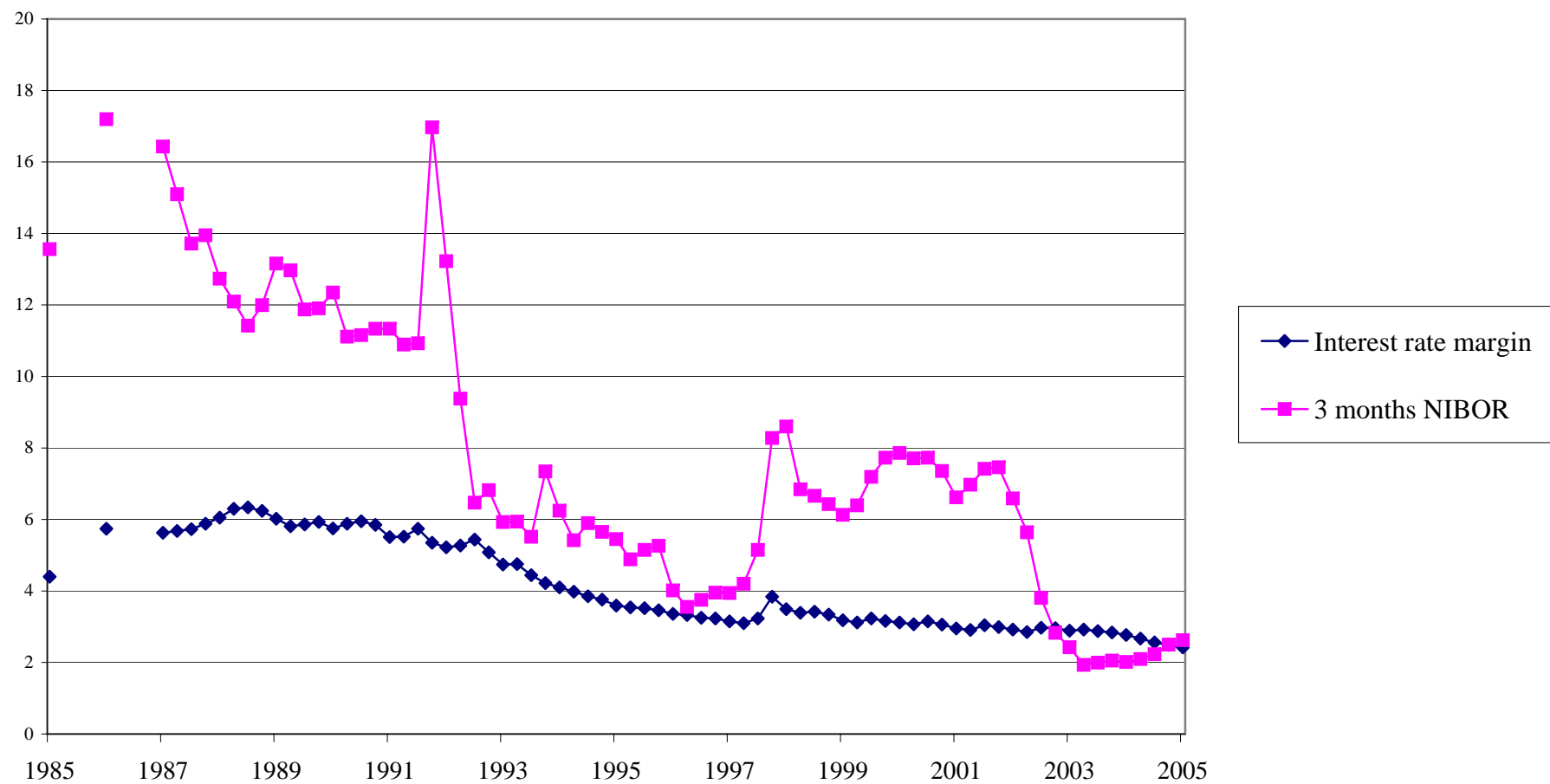


Table 4 shows descriptive statistics for size per bank. Because the mean is always above the median, all distributions are skewed to the right, reflecting that each type has a few banks that are atypically large. Focusing on median size, the table shows that on average, a commercial bank is roughly five times larger than a PCC bank, which in turn is twelve times the size of a pure savings bank. Apparently, median size has grown much more strongly in commercial banks than in savings banks of either type. However, the decline in the median PCC bank in the table does not mean that existing PCCs became smaller. It is due to the fact that the first non-PCC savings banks that converted were much larger than the subsequent converters. Thus, if we instead follow each individual bank over time, we find that the average annual growth is 12.2% for commercial banks, 12.6% for PCC banks¹⁶ and 10.3% for non-PCC banks. The differences between these averages are not statistically significant.

To summarize this section, the Norwegian banking industry consists of commercial banks and savings banks, and a savings bank is either a PCC bank or a non-PCC bank. The relative size of the commercial bank and the savings bank sectors stays roughly equal over the sample period 1985-2002. On average, the median commercial bank is five times the size of a PCC bank, which in turn is twelve times larger than a non-PCC bank. The concentration of the banking industry increases over time, as the number of listed commercial banks drops from 15 to 2, and the number of non-PCC banks falls from 191 to 103. The latter decline is partially driven by non-PCCs that transform themselves into PCCs. The first PCC bank was established in 1988, the number grows steadily to 24 in 2002, and the aggregate size of PCC banks exceeds that of non-PCC banks from 1991 on. Asset growth per bank is somewhat larger in commercial banks than in pure savings banks, and the average PCC bank grows slightly faster than commercials. Although we lack sufficiently detailed data for formal tests, we find supporting evidence of the Allen et al. (2006) prediction that closer attention to multiple stakeholders makes the firm compete in a softer way.

¹⁶ Excluding the switching year, in which PCC banks may have a particularly high growth, the average PCC growth rate drops from 12.6% to 12.1%.

Table 4: Size per bank

Year	<u>Non-PCC</u>					<u>PCC</u>					<u>Commercial</u>				
	Min	Max	Mean	Std	Med	Min	Max	Mean	Std	Med	Min	Max	Mean	Std	Med
1985	0.01	57.2	1.4	4.7	0.4						0.94	107.6	25.1	37.9	9.2
1986	0.01	65.8	1.6	5.3	0.4						1.25	138.0	29.5	47.0	9.9
1987	0.02	120.8	2.6	11.1	0.5						2.02	158.6	41.7	57.0	11.5
1988	0.02	27.2	1.7	4.2	0.5	2.62	114.1	43.0	50.5	12.3	1.91	166.9	38.4	52.2	11.6
1989	0.02	26.4	1.5	3.8	0.6	0.82	103.1	21.3	33.9	10.6	1.67	179.3	41.4	57.3	11.5
1990	0.02	25.1	1.4	3.7	0.5	0.81	97.6	19.9	32.1	8.4	2.36	257.7	58.9	88.2	20.4
1991	0.02	19.3	1.1	2.2	0.6	0.81	91.1	20.5	27.7	13.0	4.03	251.0	50.1	77.6	14.7
1992	0.02	17.4	1.1	2.0	0.6	0.23	90.3	18.3	26.7	10.1	4.02	235.4	47.0	74.1	12.5
1993	0.02	16.6	1.1	2.0	0.6	0.83	92.6	21.1	28.1	14.5	1.76	198.0	46.9	67.4	19.7
1994	0.02	10.7	1.0	1.4	0.6	0.80	95.4	19.9	26.5	15.0	6.75	186.5	50.7	65.4	28.2
1995	0.02	11.3	1.0	1.5	0.6	0.03	98.4	15.6	24.6	4.5	6.89	195.5	57.0	71.2	26.2
1996	0.02	12.2	1.1	1.7	0.7	0.07	114.3	15.5	27.1	3.4	9.18	220.8	68.6	84.9	30.4
1997	0.02	13.5	1.2	1.8	0.7	0.07	131.4	17.4	31.1	4.0	11.88	257.9	83.5	103.9	27.7
1998	0.02	14.7	1.2	1.9	0.8	0.07	144.3	15.1	30.7	3.8	13.97	272.0	86.2	107.0	29.9
1999	0.03	16.7	1.3	2.1	0.8	0.08	188.7	16.9	38.3	4.4	23.33	338.5	154.8	154.9	128.7
2000	0.08	18.4	1.5	2.4	0.9	0.10	201.5	18.1	40.3	4.7	25.77	361.0	166.2	166.1	139.1
2001	0.09	19.8	1.6	2.5	1.0	0.11	221.9	19.7	44.2	5.0	29.60	375.6	146.8	198.2	35.1
2002	0.10	21.0	1.8	2.7	1.1	0.13	235.0	20.8	46.7	5.4	36.61	395.8	216.2	254.0	216.2
Average	0.03	28.6	1.4	3.2	0.7	0.50	134.6	20.2	33.9	7.9	10.2	238.7	78.3	98.0	43.5

For every year and bank type, the table reports the minimum and maximum size, the mean size, the standard deviation, and the median size per bank. Size is measured by the book value of assets in constant (2002) billion NOK. Non-PCC banks are ownerless foundations (pure savings banks). PCC banks used to be pure savings banks that later transformed themselves into PCC banks by issuing equity securities to the general public in terms of Primary Capital Certificates (PCC).

4. Stakeholder structure and balance sheet characteristics

Based on the idea that the distribution of control rights drives the firm's decisions and the fact that a bank's assets and liabilities have low adjustment costs, this section explores the relationship between bank type and the balance sheet composition. We start with simple descriptive statistics showing how the balance sheet differs across the three bank types. Estimates from a logit model presented towards the end of the section generally confirm the impression from the descriptive statistics.

4.1 Assets

Table 5 shows descriptive statistics for the asset structure across bank types. We divide total assets into the seven categories of fixed assets, down-payment contracts, short-term assets, overdraft facilities, building loans, other loans, and losses.¹⁷ Using a bank's total assets as weights, all averages in the table are value-weighted.

The interest earned is lower on downpayment contracts than on overdraft facilities and building loans. This difference reflects riskiness and handling costs. Consumers mainly demand mortgages for their downpayment contracts, which reduces the risk and the interest rate. Business loans are generally more risky and pay a higher average return.

A bank wanting to increase the expected return may shift some assets away from downpayment contracts to more risky instruments. This will produce a higher interest rate margin and higher asset risk. Given the stakeholder structure, we expect to find the highest fraction of downpayment contracts in non-PCCs, while PCCs and commercials have more of its assets in the more risky asset classes towards the right in the table.

Table 5 shows that downpayment contracts constitute the largest component of the assets for all bank types and all years, and that its relative importance increases over time with few exceptions.¹⁸ Consistent with our stakeholder based risk argument, the average fraction of downpayments is higher in savings banks (about 75%) than commercial banks (49%), and consistently higher in non-PCCs than in PCCs after 1997.

Short-term assets constitute the second largest assets component for every bank type. As an average over time, investments in short-term assets are slightly more common in commercial banks (21% vs. 17%). However, its relative importance tends to grow after the mid-1990s in commercial banks and PCC banks. In contrast, non-PCC banks reduce the relative holdings of short-term assets almost every year.

¹⁷ Short-term assets include cash, loans to the central bank, loans to other financial institutions, short-term bonds, and shares in non-associated companies with less than a 20% ownership stake. Down-payment contracts are loans where the principal is gradually paid back, such as mortgages. Other loans are all loans not fitting into any other category, such as factoring, leasing, and credit cards. Fixed assets include real estate, long-term bonds and shares representing at least 20% ownership. Losses is the actual loss in the period plus increased allowances made for expected future losses.

¹⁸ The low figures for the two first sample years in commercial banks is due to a classification system which allocated most downpayment contracts to other loans category.

Table 5: Asset structure for the three bank types

Year	<u>Fixed assets</u>			<u>Downpayment contracts</u>			<u>Short-term assets</u>			<u>Overdraft facilities</u>			<u>Building loans</u>			<u>Other loans</u>			<u>Losses</u>		
	Non-			Non-			Non-			Non-			Non-			Non-			Non-		
	PCC	PCC	Com	PCC	PCC	Com	PCC	PCC	Com	PCC	PCC	Com	PCC	PCC	Com	PCC	PCC	Com	PCC	PCC	Com
1985	2.7		4.1	57.5		0.6	29.4		29.8	7.1		12.8	5.6		4.3	-		50.6	-2.3		-2.1
1986	2.8		3.8	62.1		3.9	24.4		28.5	7.6		12.4	5.5		4.2	-		49.0	-2.3		-1.9
1987	2.8		4.0	60.5		32.6	24.4		29.3	8.8		12.3	5.7		3.9	0.0		19.3	-2.2		-1.4
1988	3.2	2.1	4.3	62.2	59.7	40.3	21.2	24.7	21.9	8.6	9.0	11.4	5.2	5.7	4.2	1.9	0.2	19.4	-2.3	-1.4	-1.5
1989	3.1	2.4	4.2	64.7	65.3	45.2	21.6	19.2	19.7	7.4	9.6	9.0	3.9	5.1	3.0	1.6	0.3	20.3	-2.3	-1.9	-1.5
1990	2.7	2.7	4.1	68.5	71.0	46.4	20.5	16.2	20.3	6.9	7.5	7.7	3.2	4.0	3.0	0.3	-	19.7	-2.1	-1.4	-1.3
1991	2.6	2.6	3.9	70.0	74.5	51.6	21.0	13.8	16.8	6.0	7.7	7.8	2.2	2.8	1.8	0.6	0.0	20.0	-2.4	-1.4	-1.8
1992	2.4	2.7	4.1	73.9	77.6	58.7	18.5	14.4	20.5	5.9	8.2	8.7	1.7	2.4	1.3	0.1	0.0	13.2	-2.4	-5.5	-6.4
1993	2.1	3.4	4.0	77.0	78.2	59.9	16.5	14.8	19.8	5.1	6.6	7.4	1.6	1.9	1.0	0.0	0.0	14.3	-2.4	-5.0	-6.4
1994	4.7	3.1	3.5	76.3	78.1	55.4	13.4	14.7	17.4	5.0	5.6	5.9	1.6	2.1	1.0	1.0	0.0	21.6	-2.0	-3.6	-4.9
1995	2.0	3.5	2.7	77.6	79.9	60.1	15.5	12.4	16.7	5.2	4.9	6.2	1.6	2.0	1.3	0.0	0.0	16.4	-1.9	-2.8	-3.5
1996	1.9	3.0	2.6	79.4	79.7	62.1	13.8	13.0	17.9	4.8	4.6	5.4	1.8	1.9	1.1	0.0	0.0	13.1	-1.7	-2.1	-2.3
1997	1.7	3.0	2.2	80.1	79.5	60.6	12.9	12.5	18.1	4.6	4.6	5.7	2.1	2.0	1.5	0.0	0.0	13.7	-1.5	-1.7	-1.8
1998	1.7	2.6	2.1	80.4	78.3	54.7	12.7	14.0	18.4	4.7	4.6	4.7	2.1	1.8	1.2	0.0	0.0	20.5	-1.6	-1.4	-1.7
1999	1.6	2.9	2.2	80.5	74.6	55.4	13.3	17.0	23.4	4.4	5.1	5.7	1.8	1.6	0.8	0.0	0.0	13.9	-1.5	-1.3	-1.3
2000	1.4	2.6	2.0	81.3	74.1	59.2	13.0	17.6	22.1	4.1	5.0	6.6	1.7	1.9	0.8	0.0	0.0	10.4	-1.5	-1.2	-1.1
2001	1.3	2.7	1.9	82.0	74.1	70.5	12.3	17.5	19.5	4.1	5.2	6.0	1.8	1.6	0.9	0.0	0.0	2.3	-1.5	-1.2	-1.0
2002	1.2	2.1	2.4	82.7	74.0	66.7	12.1	18.6	23.5	3.9	4.7	5.7	1.7	1.8	0.6	0.0	0.0	2.1	-1.5	-1.3	-0.9
Average	2.3	2.8	3.2	73.1	74.6	49.1	17.6	16.0	21.3	5.8	6.2	7.9	2.8	2.6	2.0	0.3	0.0	18.9	-2.0	-2.2	-2.4

All figures are reported as percent of total assets, and are value weighted averages. Fixed assets are buildings and investments in affiliated companies. Short-term assets are cash, cash equivalents and securities held for trading. Downpayment contracts are loans that are amortized (gradual repayment of the principal), e.g. mortgages. Overdraft facilities are trade credits and other fixed limit loans. Building loans are fixed limit loans. Other loans include all other loans, e.g. credit card debt and leasing. Losses are allowances for losses on all loan portfolios.

Although the pooled average for losses is practically the same fraction of total assets in all three types (roughly 2%), the time pattern differs considerably. The fraction decreases slowly from about 2.4% at the end of the banking crisis to 1.7% four years later in non-PCC banks. In contrast, the losses are typically two to three times higher in commercial banks and PCCs in the final crisis year and are also larger every year over the next four years. Thus, pure savings banks that survived the crisis were less adversely affected by losses after the crisis than the survivors among the two other types.

For expositional reasons, table 5 does not report the statistical significance of all the 462 pairs of differences across the three bank types. Choosing a 5% level and using a one-sided test, we find that compared to commercial banks, non-PCC banks have significantly more down-payment contracts, less short-term assets, and less unsecured loans in every year. Except for unsecured loans, the differences are generally less significant when comparing commercial banks to PCC banks. Finally, the difference between non-PCC banks and PCC banks is relatively seldom statistically different across all years and asset components.

Finally, if we compare the value-weighted averages in table 5 to their equally weighted equivalents in appendix table A.1, we find size effects in the asset structure. First, large PCC banks and commercial banks tend to have more short-term assets and less down-payment contracts than smaller banks of the same type. For instance, the average allocation to short-term assets and down-payment contracts in PCC banks in 2002 is 12.5% and 80.6% under equally-weighting and 18.6% and 74.0% with value-weighting, respectively. The corresponding figures for commercials are 15.6% and 78.4% versus 23.5% and 66.7%. Second, unlike pure savings banks, larger commercial banks and PCC banks have a higher proportion of fixed assets than corresponding banks of the same type. One possible explanation is that as banks grow, they tend to diversify into businesses other than lending, such as real estate.

4.2 Liabilities

Just like the assets, the right-hand side of the balance sheet matters for behavior and performance because it can be used to manage risk and return. For instance, banks relying on short term money market funding will face higher risks and higher expected returns than banks with a high fraction of core deposits. Also, the liability structure is important for survival under adverse market conditions, such as in the 1988-1992 crisis years in our sample. This concern for financial distress is compounded by the fact that banks have much higher financial leverage than firms in other industries. Thus, differences in liability structure across bank types may reflect the uniqueness of their organizational form.

We classify liabilities into the five categories of equity, due to customers, subordinated debt, due to financial institutions, and other liabilities.¹⁹ Risk is higher the more the bank is financed with debt, and the more risky the components of the debt. Deposits from customers is regarded the safest form of debt financing. This liability is insured by a fund collectively financed by the banks, and the government acts as a lender of last resort. Therefore, there is no deposit risk for the customers

¹⁹ The item Due to financial institutions is deposits and loans from other financial institutions, including the central bank. Due to customers is deposits from customers, subordinated debt is debt that can be included as capital when calculating capital adequacy ratios, and other liabilities is all other debt including debt securities issued. Equity is total funds for savings banks (including PCC capital for PCC banks) and total shareholder equity for commercial banks. Equity in savings banks includes the gift fund.

even if the bank faces financial distress. Interbank lending and other liabilities represent market funding. These liabilities are sensitive to interest rate movements and may also be more costly to roll over under adverse conditions. Thus, banks relying more on market funding are generally more risky than others. In the table, this means that risk generally increases from left to right. Moreover, we expect non-PCCs to use more equity and deposits from customers, whereas commercial banks would use interbank funding and other market-based debt financing.

Consistent with the idea that non-PCC banks take less risk than other banks, table 6 shows that they have more equity than others. Moreover, equity for all bank types starts increasing after the end of the crisis, when the equity was around 7% for non-PCCs and 3% for the other two. Thus, all bank types become permanently less leveraged after the crisis, but non-PCC banks increase their relative equity financing the most.²⁰

The composition of the debt financing differs substantially across the three organizational types. Considering first the averages across the sample period, the table shows that compared to commercial banks, pure savings banks rely more on deposits (75% vs. 47%), use less subordinated debt (0.3% vs. 3.2%), borrow less from financial institutions (9.5 % vs. 18.9%), and finance less from other debt sources (6.6% vs. 25.8%). Thus, non-PCC banks finance their assets much more by deposits and much less by market borrowing than commercial banks. PCC banks are roughly midway between the two.

For every bank type, the funding through financial institutions drops considerably over time, the importance of other liabilities increases, and the use of subordinated debt stays fairly constant.²¹ Savings banks rely increasingly less on deposits, whereas their importance for commercial banks stays fairly constant. However, the fraction of assets financed by deposits gradually approach each other in PCC banks and commercial banks. In the final year, they are 53.4% and 49.7%, respectively. This pattern suggests that just like commercial banks, which they resemble more and more over time in terms of debt structure, PCC banks are more dependent on the capital market than non-PCC banks. This financing strategy makes PCC banks more sensitive to adverse credit market conditions than the non-PCC type they have converted from.

²⁰ Norwegian banking regulation imposes a minimum capital requirement. Total liable capital must be at least 8% of total risk weighted assets. Depending on the bank's balance sheet structure, total risk-weighted assets may differ substantially from total assets.

²¹ Subordinated debt seems to have been important for PCC banks and commercial banks in the last part of the crisis and some years thereafter. This is probably due to the deposit insurance scheme, which contains two guarantee funds (one for savings banks and one for commercial banks) financed by the banks themselves. In addition, the central bank acts as a lender of last resort. There is no explicit public insurance system for financially distressed banks, and any support is determined on a case-by-case basis. When banks were unable to meet their obligations during the crisis years, the guarantee funds disbursed subordinated debt to save struggling banks. As the crisis evolved, the guarantee funds' capital was exhausted, and the government established a new guarantee fund and an investment fund that issued guarantees, extended loans, and also made equity investments in the troubled banks.

Table 6: Liability structure for the three bank types

Year	<u>Equity</u>			<u>Subordinated debt</u>			<u>Due to customers</u>			<u>Due to banks</u>			<u>Other liabilities</u>		
	Non-PCC	PCC	Com	Non-PCC	PCC	Com	Non-PCC	PCC	Com	Non-PCC	PCC	Com	Non-PCC	PCC	Com
1985	4.7		4.7	0.3		2.5	78.8		59.7	11.5		21.2	4.8		11.9
1986	4.0		4.3	0.3		2.5	67.8		43.4	22.5		31.6	5.4		18.2
1987	4.1		3.6	0.2		2.9	63.6		42.8	25.2		29.8	6.8		20.9
1988	4.0	3.5	3.3	0.5	2.0	3.6	68.0	58.3	42.2	22.8	27.0	28.0	4.7	9.4	22.9
1989	5.1	3.8	3.4	0.6	1.6	3.4	73.3	62.6	42.0	17.1	22.5	25.6	3.9	9.5	25.6
1990	5.1	3.3	2.8	1.1	1.6	3.0	75.7	67.6	41.1	13.8	17.2	26.2	4.4	10.3	27.0
1991	5.7	2.7	1.3	0.5	2.5	4.1	81.6	72.7	42.2	9.2	16.4	20.1	3.0	5.7	32.4
1992	8.6	3.0	2.2	0.7	4.2	5.0	82.6	74.3	48.5	6.1	13.9	18.9	2.1	4.6	25.5
1993	9.7	5.6	4.6	0.7	4.0	5.0	83.4	72.6	48.9	3.8	10.4	16.4	2.3	7.4	25.1
1994	11.0	5.8	6.4	0.3	4.5	3.7	82.1	72.1	51.3	3.7	7.8	12.7	2.8	9.8	25.9
1995	11.9	6.3	7.2	0.2	3.4	3.3	81.0	71.3	53.0	3.5	7.0	10.9	3.5	12.0	25.6
1996	11.8	6.3	6.4	0.1	3.3	3.0	79.0	66.4	48.2	3.9	8.9	14.4	5.2	15.1	28.0
1997	11.7	6.1	6.2	0.1	3.3	3.2	75.2	58.9	43.5	4.8	12.6	19.3	8.2	19.1	27.8
1998	11.8	6.9	6.4	0.1	2.9	3.2	74.5	56.3	43.1	4.9	13.3	15.6	8.8	20.6	31.7
1999	11.8	6.5	6.9	0.0	2.7	2.7	72.1	54.2	48.7	5.4	14.7	13.9	10.7	21.8	27.8
2000	11.5	6.7	6.8	0.1	2.8	2.9	70.6	52.7	47.4	4.8	11.4	14.1	13.0	26.4	28.8
2001	11.1	6.5	7.0	0.1	2.7	2.2	70.4	51.4	50.8	4.9	11.3	10.4	13.5	28.1	29.7
2002	10.6	6.0	6.7	0.2	2.8	2.0	70.1	53.4	49.7	4.0	10.2	11.9	15.1	27.6	29.8
Average	8.6	5.3	5.0	0.3	3.0	3.2	75.0	63.0	47.0	9.5	13.6	18.9	6.6	15.2	25.8

All figures are reported as percent of total assets, and are value weighted averages. The total average weights the years equally. Subordinated debt is debt that can be regarded as capital for capital requirement calculations. Due to customers is regular deposits from customers. Due to banks is inter-bank loans including loans from the central bank. Other liabilities includes securities issued.

Like for assets in table 5, we do not report the statistical significance of all the differences across the three bank types. With a 5% level and a one-sided test, we find that across all years and all financing components, the difference in means between non-PCC banks and commercial banks (PCC) banks is significantly different from zero in 83% (89%) of the cases. PCC banks differ significantly from commercial banks in one third of the cases.

Just like we found for asset structure, the composition of liabilities varies with bank size. If we compare the value-weighted averages in table 6 with their equally-weighted counterparts in appendix table A.2, we find that independently of bank type, large banks rely more on loans from financial institutions and on other liabilities, while small savings banks finance themselves more often with deposits. This pattern might reflect that deposits is the preferred liability, but that large banks and particularly savings banks tend to deplete this resource and need to raise capital from the money market, the central bank, or elsewhere. An alternative explanation is that small banks have difficulties raising capital in the capital market due to high fixed issue costs and higher information asymmetry.

To check for differences in balance sheet structures more systematically and also to account for multivariate relationships, we estimate a logit model in table 7 that predicts bank type based on the bank's size, growth, and balance sheet structure. We report our findings separately for the whole sample period (1985-2002), the crisis years (1988-1992), and for the post-crisis period (1993-2002). The results generally support the simple patterns in the descriptive statistics. For instance, the probability that a randomly selected bank is a commercial bank rather than a non-PCC bank is always significantly higher the larger the bank and the more risky its assets. In contrast, growth differences have no predictive power except for PCCs vs non-PCC banks after the crisis.

The basic idea in this section is that differences in stakeholder structure produce differences in behavior. In particular, the stronger the potential conflict of interest between powerful owners and other stakeholders (employees and customers), the riskier, larger, and more fast-growing the bank. However, stakeholder differences across banks may not be the only reason why their balance sheets differ. Because commercial banks are much larger than savings banks, they may be tempted to take on excessive risk, driven by a feeling of being too big to fail. This is a moral hazard problem triggered by the regulator's desire to prevent contagion. Furthermore, the risk of non-PCCs may be low because they cannot raise new equity. Thus, unlike other bank types, pure savings banks may feel forced to maintain a higher equity financing buffer and hence lower liability risk to protect themselves from adverse effects of market downturns. These additional explanations, which have not been accounted for in this section, may bias our results towards finding larger risk differences between bank types than what is justified by their stakeholder structures alone. Although we are unable to address the potential moral hazard problem, section 5.4 will show that the inability to raise new equity in non-PCCs is not a binding constraint on their behavior.

Summarizing, this section has documented a systematic relationship between stakeholder structure and balance sheet composition across the three organizational forms. Non-PCC banks carry less risk on both sides of their balance sheet than commercial banks. This is consistent with stakeholder-driven firm behavior as found for depositor-owned S&Ls vs. stockholder-owned commercial banks in the US (Esty, 1997a). Local governments and depositors, who hold a controlling stake in non-PCC banks, make sure the bank is run safely and provides loans to the local industry. In

contrast, stockholders control commercial banks and want it to maximize shareholder value by choosing assets and liabilities with higher risk. Finally, because the control rights in PCC banks belong to stakeholder types found both in pure savings banks (employees, customers, and politically appointed directors) and in pure commercial banks (employees and shareholders), our finding that PCC banks end up in between the two pure types on most balance sheet characteristics is as expected from the theory.

We expect that these differences in risk across organizational forms will reappear in terms of systematic performance differences across changing market conditions. In particular, the lower risk of ownerless firms will make their returns to capital invested move less with overall market movements than owned firms. Thus, we expect that compared to commercial banks, the performance of pure savings banks is stronger the weaker the overall banking market. The next section supports this intuition.

Table 7: Logistic regressions for bank type

Independent variable	<u>1986-2002</u>			<u>1988-1992</u>			<u>1993-2002</u>		
	Comm (Non-PCC)	PCC (Non-PCC)	Com (PCC)	Com (Non-PCC)	PCC (Non-PCC)	Com (PCC)	Com (Non-PCC)	PCC (Non-PCC)	Com (PCC)
Constant	-2.36 <i>-0.46</i>	-33.42 <i>-7.36</i>	83.22 <i>5.86</i>	7.64 <i>0.96</i>	-32.40 <i>-3.02</i>	58.28 <i>3.50</i>	-335.13 <i>na</i>	-30.12 <i>-5.97</i>	117.56 <i>4.14</i>
Size	0.87 <i>5.65</i>	0.93 <i>9.55</i>	0.09 <i>0.43</i>	0.51 <i>1.90</i>	0.90 <i>3.83</i>	-0.24 <i>-0.83</i>	27.57 <i>0.06</i>	0.88 <i>8.17</i>	0.51 <i>1.27</i>
Growth	-2.99 <i>-1.90</i>	4.62 <i>3.87</i>	-3.38 <i>-1.83</i>	-1.73 <i>-0.98</i>	0.00 <i>0.00</i>	-2.05 <i>-1.14</i>	99.00 <i>na</i>	6.10 <i>4.45</i>	-2.83 <i>-0.45</i>
Liability risk	22.37 <i>8.07</i>	8.61 <i>5.78</i>	33.58 <i>6.21</i>	23.83 <i>5.02</i>	12.76 <i>3.15</i>	23.85 <i>3.56</i>	478.89 <i>na</i>	8.03 <i>5.00</i>	47.17 <i>4.28</i>
Asset risk	-1.27 <i>-0.41</i>	-20.67 <i>-5.89</i>	70.45 <i>6.17</i>	-3.34 <i>-0.81</i>	12.76 <i>3.15</i>	44.02 <i>3.44</i>	-23.17 <i>na</i>	-15.60 <i>-3.70</i>	100.21 <i>4.34</i>
Year dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes
Random effects	no	no	no	no	no	no	no	no	no
Log likelihood	-107.6	-369.7	-54.2	-46.6	-60.9	-26.3	0.0	-304.0	-23.2
LR chi ²	864.0	608.2	324.0	302.1	147.9	67.8	486.5	430.6	227.8
Probability chi ² , %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pseudo R ²	80.1	45.1	74.9	76.4	54.8	56.3	100.0	41.5	83.1
n	2237	1979	331	701	678	91	1185	1301	240

The dependent variable is a dummy that is 1 (0) if the bank is of the type specified outside (inside) the parenthesis in the column heading. Size is the log of total assets, growth is the gross growth in total assets from beginning to end of year t. Asset risk is the fraction of assets which is not cash, claims on the central bank, loans to customers, or fixes assets. Liability risk is operationalized as one minus deposits divided by total assets. We report the log likelihood ratio (LR), the Chi² of LR, its probability, the pseudo R², and the number of observations.

5. Stakeholders and performance

So far, we have found that the stakeholder structure relates systematically to the firm's behavior. However, the critical governance question from an economic point of view is not whether stakeholder structures matter for behavior *per se*, but whether this relationship influences performance. As discussed in section 2, the principal-agent paradigm argues that the firm's economic performance will be lower the weaker the control rights of the owners and the more sensitive the firm's decisions to welfare effects on non-owner stakeholders. Thus, because owners have a controlling majority in profit-maximizing commercial banks but not in more stakeholder-oriented savings banks, commercial banks will have higher returns to capital invested. Moreover, although all savings banks have multiple goals and several stakeholder types with control rights, capital owners have partial control in PCC banks, but do not even exist in non-PCCs. Thus, the agency model predicts that PCC banks will outperform non-PCCs in economic terms. According to Allen et al. (2006), however, owners of capital may fare better and not worse if they internalize other stakeholders' welfare in the firm's objective function.

Because non-PCC banks are unlisted, we cannot measure performance by market returns. Instead, our basic performance measure is book return on assets (ROA), which we define as net income per unit book value of total assets. Although return on equity (net income per unit book equity) is a more direct measure of economic performance from the stockholders' point of view, it is unsuitable in our context because its denominator is periodically very low and even negative in the crisis years, producing very volatile figures. For instance, average return on equity across the commercial banks is -152% in 1991 and 18% in 1997.

The reason we measure return on assets after rather than before debt funding costs is that these costs is by far the largest component of the bank's total costs, typically 70-80%. Thus, not deducting funding costs means ignoring a major driver of the bank's competitive advantage. For the same reason, earnings before funding costs, which is completely dominated by interest income, is very sensitive to the level of interest rates. This means gross return on assets will move automatically in tandem with the level of interest rates, regardless of the bank's ability to create returns on capital invested. Such interest level effects are absent in our ROA measure, which is also used in the existing research that comes closest to ours (Esty, 1997a; Crespi et al, 2004). Notice that because our net ROA relates income after debt funding costs to total assets, it will produce lower return figures than under the gross ROA definition. Thus, we cannot meaningfully relate ROA to standard benchmarks such as the riskless rate or the market risk premium. Still, in order to assess the sensitivity of our findings to the performance measure used, we will analyze the effect of using alternative performance measures in section 5.3. Simple descriptive statistics of these alternatives are presented in section 5.1,

5.1 Descriptive statistics

The first three columns of table 8 show the sample firms' average ROA across bank types and time periods. On average over the years, pure savings banks have the highest return on assets, being 0.88% in non-PCC banks, 0.41% in PCCs, and 0.32% in commercial banks. Non-PCCs outperform commercial banks in 15 of the 18 sample years, and PCC banks are closer to commercial banks than to non-PCCs. However, the t-values to the right show that the statistical significance of the performance differences is considerably weaker after the banking crisis than before and during the crisis.

Table 8: The return on assets

Year	Mean			t-value for difference in mean		
	(1) Non-PCC	(2) PCC	(3) Com	(1)-(2)	(2)-(3)	(1)-(3)
1985	0.43		0.35			1.57
1986	0.46		0.35			1.79*
1987	0.55		0.07			4.60*
1988	0.40	-0.15	-0.97	3.20*	1.02	1.74*
1989	0.64	-0.05	-0.51	2.86*	0.52	1.36
1990	0.50	-1.00	-0.19	1.37*	-0.71	2.31*
1991	0.33	-1.14	-1.91	2.04*	0.71	2.61*
1992	2.60	0.01	-0.59	2.85*	0.50	3.93*
1993	1.41	1.55	0.98	-0.45	1.82*	3.65*
1994	1.15	0.99	0.96	1.32	0.14	0.88
1995	1.27	0.80	1.16	1.58	-0.98	0.43
1996	0.67	0.56	0.92	1.05	-1.34	-0.99
1997	1.06	0.84	1.03	1.58	-0.98	0.19
1998	0.83	0.80	0.74	0.40	0.49	0.89
1999	1.11	1.05	0.92	0.72	0.95	1.59
2000	1.18	1.00	0.91	1.92*	0.66	2.20*
2001	0.76	0.66	0.86	1.07	-1.19	-0.67
2002	0.52	0.22	0.63	1.56	-2.18*	-1.66
Average	0.88	0.41	0.32	2.02*	0.33	2.38*

The table reports the equally weighted return on assets (ROA) for the population of Norwegian banks. ROA is defined as net income divided by total assets. t-values marked with a * reflects a difference between two means which is statistically different from zero at the 5% level. Non-PCC banks are ownerless foundations (pure savings banks). PCC banks used to be pure savings banks that later transformed themselves into PCC banks by issuing equity securities to the general public in terms of Primary Capital Certificates (PCC).

Appendix tables A.3-A.6 show the differences in average performance based on four alternatives to the ROA in table 8. Focusing on the statistically significant differences, table A.3 shows that the interest rate margin (net interest income divided by assets) is always lowest in commercial banks, and that non-PCC banks mostly have higher interest rate margins than PCC banks. The profit margin (net income divided by income) in table A.4 seldom differs across bank types after the crisis. Finally, the gross return on assets (income before funding costs divided by assets) in table A.5 and the return on equity (net income divided by equity) in table A.6 generally show insignificant differences between bank types up to and including the banking crisis, and that performance is highest in commercial banks after the crisis.

Table 9 shows the volatility of ROA per bank across the three bank types, measuring volatility in year t as the standard deviation of ROA over the period $t-1$ to $t+1$. Like we found using risk measures from the balance sheet in section 4, risk is highest in commercial banks (0.68%), lowest in non-PCCs (0.45%), and PCCs are in between (0.58%). As expected, volatility is higher for all bank types around the banking crisis.

Table 9: The volatility of return on assets

Year	<u>Non-PCC bank</u>		<u>PCC bank</u>		<u>Commercial bank</u>	
	Mean	Median	Mean	Median	Mean	Median
1985						
1986	0.14	0.12			0.24	0.23
1987	0.18	0.14			0.89	0.33
1988	0.21	0.18	0.23	0.12	0.88	0.27
1989	0.22	0.20	1.06	0.24	0.46	0.25
1990	0.34	0.18	0.83	0.47	1.46	1.09
1991	1.29	1.46	1.17	0.81	1.76	1.62
1992	1.24	1.34	1.54	0.79	1.94	1.94
1993	1.02	1.02	0.72	0.54	1.36	1.58
1994	0.30	0.23	0.45	0.38	0.38	0.30
1995	0.40	0.36	0.34	0.37	0.31	0.29
1996	0.35	0.33	0.38	0.32	0.34	0.23
1997	0.26	0.23	0.25	0.20	0.35	0.41
1998	0.24	0.20	0.23	0.17	0.12	0.09
1999	0.28	0.26	0.23	0.22	0.15	0.10
2000	0.30	0.27	0.29	0.23	0.11	0.13
2001	0.38	0.32	0.46	0.30	0.17	0.17
Average	0.45	0.43	0.58	0.37	0.68	0.56

The table reports the equally weighted average and the median volatility of the return on assets (ROA) for a non-PCC bank, a PCC bank and a commercial bank. ROA is defined as net income divided by total assets. The average in the bottom row is based on the pooled sample. The volatility of ROA at time t is calculated as the standard deviation of the bank's ROA in the window from $t-1$ to $t+1$. The volatility for the first year t after a conversion from non-PCC to PCC uses the ROA at $t-1$, which is the last year that the bank was still a non-PCC. Correspondingly, the volatility of a non-PCC bank in the last year before conversion uses the ROA for the first year after conversion. Non-PCC banks are ownerless foundations (pure savings banks). PCC banks used to be pure savings banks that later transformed themselves into PCC banks by issuing equity securities to the general public in terms of Primary Capital Certificates (PCC).

Table 8 shows that the performance of commercial banks was most negatively hit by the banking crisis. As discussed in section 4, this is implied by our finding that

they pursue more risky investment and financing strategies. That is, the fact that commercial banks have more risky balance sheets will necessarily make them more vulnerable to downturns in the market. What is more surprising is that they do not appear to be doing correspondingly better after the crisis. We next analyze this issue.

5.2 Statistical tests for the base case

Since our data set has a panel data structure, using OLS on the pooled sample will produce biased and inefficient estimates. To reduce this problem, we use a random effects panel data model to account for fixed effects at the firm level and year dummies to capture fixed effects for the banking industry as a whole. Although this section only discusses the results using random effects and time dummies, the tables also show the findings using time dummies only (and no random effects) and using neither of the two (i.e., pooled OLS with no fixed effect controls). We return to these two alternative models in section 5.3.

Our findings for the base case are reported in table 10. PCC and Com are dummy variables that equal one if the bank is of the said type and zero otherwise. Thus, both are zero for a non-PCC bank. We proxy for asset risk and liability risk by the ratio $1 - ((\text{cash} + \text{loans} + \text{fixed assets}) / \text{total assets})$ and the ratio $1 - (\text{due to customers} / \text{total assets})$, respectively, leaving the alternative risk measure based on ROA to the robustness tests in section 5.3. The role of firm size is captured by the log of total assets.

According to the agency model, the two dummy variables will have positive coefficient estimates, and the coefficient for the commercial bank will be the more positive of the two. In the Allen et al. (2005) model, however, we cannot in general rank the coefficients a priori. The specific situation (such as the customers' willingness to pay higher prices for products from stakeholder-oriented firms) will determine whether savings banks will have higher or lower abnormal returns to capital invested than commercial banks. Although we deal with accounting returns on operations rather than market returns on traded securities, we still expect that unless the banking industry is grossly out of equilibrium over extended periods, there will be a positive relationship between risk and return. Moreover, economies (diseconomies) of scale in banking will produce a positive (negative) coefficient for the size variable. Since the evidence on scale economies in banking is ambiguous (Berger and Humphrey, 1994; Hughes et al, 2001), we do not predict the sign for the size coefficient. Also, since what matters for this argument is size *per se* rather than how this has been attained, we do not distinguish between size attained by organic growth and by takeovers.

Model (a) includes random effects and year dummies in all three panels. According to the left panel, which shows the results for the whole period, this model explains 31% of the variation in a bank's ROA, and the χ^2 is highly significant. Non-PCC savings banks, which we know from table 8 have an average ROA of 0.9%, outperform PCC savings banks by 0.18 ROA percentage units per year and commercial banks by 0.77 after having controlled for risk and size differences. The riskiness of the assets and the liabilities are both positively related to returns, and there are diseconomies of scale.²² All these findings are statistically significant.

²² The finding that small banks outperform large banks may at least partially be explained by the fact that during the crisis period, several small, poorly performing banks were taken over by larger banks or merged with low-performing small banks. Moreover, the government's rescuing policy for failing banks was to make them merge with a larger non-failing bank or let two failing banks merge before

Table 10: The relationship between performance, bank type, risk, and size: Base-case regressions

Independent variable	<u>1985-2002</u>			<u>1988-1992</u>			<u>1993-2002</u>		
	(a)	(b)	(c)	(a)	(b)	(c)	(a)	(b)	(c)
Constant			1.835			6.437			2.020
			<i>4.80</i>			<i>5.93</i>			<i>6.60</i>
PCC	-0.181	-0.319	-0.316	-1.510	-1.168	-1.098	-0.095	-0.206	-0.157
	<i>-2.27</i>	<i>-4.75</i>	<i>-4.00</i>	<i>-4.63</i>	<i>-4.55</i>	<i>-3.65</i>	<i>-1.70</i>	<i>-4.99</i>	<i>-3.36</i>
Com	-0.765	-0.745	-0.922	-2.741	-2.156	-2.092	-0.119	-0.320	-0.074
	<i>-5.61</i>	<i>-7.71</i>	<i>-8.52</i>	<i>-6.84</i>	<i>-7.72</i>	<i>-6.39</i>	<i>-0.96</i>	<i>-3.94</i>	<i>-0.84</i>
Asset risk	1.419	2.001	0.256	1.352	2.074	1.211	1.321	1.923	2.461
	<i>5.27</i>	<i>8.78</i>	<i>1.12</i>	<i>1.74</i>	<i>3.16</i>	<i>1.81</i>	<i>5.89</i>	<i>10.40</i>	<i>12.22</i>
Liability risk	0.836	0.799	0.696	4.385	3.171	2.587	-0.482	-0.132	-0.591
	<i>3.65</i>	<i>4.22</i>	<i>3.27</i>	<i>6.33</i>	<i>6.18</i>	<i>4.36</i>	<i>-2.71</i>	<i>-0.89</i>	<i>-3.71</i>
Bank size	-0.063	-0.057	-0.015	-0.219	-0.223	-0.187	0.053	0.064	0.053
	<i>-2.78</i>	<i>-3.97</i>	<i>-0.93</i>	<i>-3.18</i>	<i>-5.28</i>	<i>-3.80</i>	<i>2.95</i>	<i>5.72</i>	<i>4.17</i>
Year dummies	yes	yes	no	yes	yes	no	yes	yes	No
Random effects	yes	no	no	yes	no	no	yes	no	No
Adj. R ² , %	31.11	30.88	3.76	37.20	37.10	13.92	33.08	33.43	12.97
F-value (Wald chi ²)	1110.7	55.0	21.8	450.4	49.3	23.7	736.3	49.8	41.6
Probability of F (chi ²), %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
n	2660	2660	2660	738	738	738	1362	1362	1362

The table relates a bank's economic performance to its hypothesized determinants as specified in the leftmost column. The models (a), (b), and (c) represent three alternative ways of handling the panel data structure as specified in the two first rows in the bottom section of the table. Performance is measured as return on assets (ROA), which we operationalize as net income after taxes divided by total assets at year end. PCC (Com) is a dummy variable that equals 1 if the bank is a PCC bank (Commercial bank) and zero otherwise. Asset risk is the fraction of assets which is not cash, claims on the central bank, loans to customers, or fixed assets. Liability risk is operationalized as one minus deposits divided by total assets. We assume that the lower the value of these two measures, the smaller the risk. Bank size is the log of the bank's assets in constant 2002 NOK.

In the Year dummies row, a yes (no) reflects that we include (do not include) a time dummy to capture time fixed effects. Similarly a yes (no) in the Random effects row means that we use (do not use) random effects estimation to capture firm fixed effects. We report the estimated regression coefficients in bold and its t-statistic in italics. The bottom section of the table shows the adjusted R², F-value (Wald chi² for random effects regressions) with corresponding p-value, and the number of observations for each regression.

The middle panel of table 10 estimates the basic model over the crisis years 1988-1992. Every estimated sign from the full sample period is maintained, and the economic as well as the statistical significance of the estimates increase considerably except for asset risk. For instance, the expected excess ROA of a pure savings bank is now 1.5 percentage units relative to a PCC and 2.7 compared to a commercial bank. Thus, what holds for the full sample period is even more pronounced in the crisis years. As noticed in section 4, the fact that ownerless banks are less risky makes us expect that they will do better than others in a systemic crisis.

So, maybe the pattern for the full period in the left panel is driven by the exceptional crisis years in the middle panel. The right panel brings us closer to an answer. Although the coefficients of the two dummy variables keep their negative sign, they are much smaller, being down by almost 50% for PCCs and by over 80% for commercial banks. Moreover, the coefficient of the commercial bank dummy is not significantly different from zero, and the coefficient of the PCC dummy is only significant at the 9% level. Thus, as indicated by the univariate statistics in section 5.1, there is no convincing performance difference between the three bank types after the crisis.²³ It may be argued, however, that the full period is more relevant than any of the two subperiods when evaluating the performance of alternative organizational forms. An organization that exists both in normal and non-normal periods must have an ability to handle both. Anyway, we can at least conclude so far that the surprising result in an agency perspective is that owned firms do not outperform ownerless firms in normal times either.

That being said, however, one may wonder what remains of the classic arguments for ownerless banks. Unlike in earlier periods, it does not seem true anymore that their customers (lenders and borrowers) would face excessive contracting costs in commercial banks, that they have particularly homogenous preferences as a group, that they would lack regulatory protection against moral hazard by commercial bank owners, or that ownerless banks are so small that agency costs are negligible. Nevertheless, our findings are inconsistent with the argument that because ownerless firms retain all their earnings and are immune to the market for corporate control, they represent the only firm type in our sample that can survive long after having lost their competitive advantage as an organizational form (Hansmann, 1996, p. 262). If this were a valid explanation, the ownerless savings banks in our sample would have had weaker performance than other banks. If anything, we find the opposite.

5.3 Robustness

We analyse the robustness of our base-case findings by (i) comparing the results under different ways of handling the panel structure, (ii) using sized-matched samples, (iii) proxying for risk by ROA volatility, and (iv) measuring performance in alternative ways.

Table 10 documents that the econometric approach to the panel structure influences the estimates. If we neither account for fixed effects per firm nor per year and instead just run OLS on the pooled sample like in model (c), the adjusted R^2 drops by almost 90% for the full period and by roughly two thirds in the two subperiods compared to models (a) and (b). Still, the estimated sign and the statistical significance of the coefficients in (c) are not strikingly different from those in models

²³ Notice also that liability risk is now inversely related to performance, and there are economies rather than diseconomies of scale.

(a) and (b), suggesting that the pooled OLS is not grossly biased and inefficient. The second point to notice from models (a) and (b) is that what matters for overall model fit is the time dummies. Thus, the fixed effect ruining the OLS estimates stem from time-varying characteristics of the banking industry as a whole rather than firm-specific effects ignored by our bank-specific measures of risk and size.

The base-case results may be influenced by the fact the most non-PCCs are small compared to PCCs and commercial banks. For instance, table 4 shows that the median commercial bank is sixty times larger than the median pure savings bank. Although our base-case models do control for size, the fact that size is consistently different across bank types may create a sample heterogeneity that is not properly picked up by our control variable. For instance, the technology used by small banks may deviate so much from the technology of large banks that size alone does not capture this difference. To test for the seriousness of this heterogeneity, we construct a matching sample where size is much more homogeneous across bank types. Our matched sample only contains pure savings banks that are larger than the smallest commercial bank, and we keep at least as many non-PCC banks as commercial banks in the sample. These restrictions reduce sample size by roughly 80% compared to the base-case. Findings are reported in table 11.

Table 11: The relationship between performance, bank type, risk, and size: Size-matched samples

Independent variable	<u>1985-2002</u>			<u>1988-1992</u>			<u>1993-2002</u>		
	(a)	(b)	(c)	(a)	(b)	(c)	(a)	(b)	(c)
Constant			-2.571 <i>-1.90</i>			4.545 <i>1.38</i>			2.809 <i>2.18</i>
PCC	-0.220 <i>-1.18</i>	-0.289 <i>-1.84</i>	-0.145 <i>-0.84</i>	-0.961 <i>-1.54</i>	-0.810 <i>-1.63</i>	-0.782 <i>-1.53</i>	-0.048 <i>-0.51</i>	-0.065 <i>-0.87</i>	-0.026 <i>-0.32</i>
Com	-0.652 <i>-2.57</i>	-0.639 <i>-3.75</i>	-0.570 <i>-3.06</i>	-2.123 <i>-2.44</i>	-1.811 <i>-3.70</i>	-1.677 <i>-3.36</i>	-0.071 <i>-0.44</i>	-0.144 <i>-1.28</i>	-0.054 <i>-0.47</i>
Asset risk	1.578 <i>1.25</i>	2.135 <i>1.76</i>	-3.106 <i>-2.89</i>	-0.256 <i>-0.09</i>	2.036 <i>0.71</i>	0.190 <i>0.07</i>	0.985 <i>0.79</i>	0.808 <i>0.72</i>	3.080 <i>2.65</i>
Liability risk	0.927 <i>1.80</i>	0.965 <i>2.66</i>	0.376 <i>0.97</i>	2.916 <i>1.82</i>	2.882 <i>3.16</i>	2.426 <i>2.65</i>	-0.589 <i>-2.17</i>	-0.485 <i>-2.21</i>	-0.651 <i>-2.92</i>
Bank size	-0.032 <i>-0.38</i>	-0.031 <i>-0.63</i>	0.045 <i>0.87</i>	-0.090 <i>-0.31</i>	-0.148 <i>-1.01</i>	-0.158 <i>-1.04</i>	0.080 <i>1.97</i>	0.095 <i>3.43</i>	0.036 <i>1.33</i>
Year dummies	yes	yes	no	yes	yes	no	yes	yes	no
Random effects	yes	no	no	yes	no	no	yes	no	no
Adj. R ² , %	28.27	25.09	3.97	16.79	12.30	7.32	30.27	25.94	8.37
F-value (Wald chi ²)	162.3	8.2	4.9	24.3	3.2	3.3	101.6	6.7	5.2
Probability of F (chi ²), %	0.00	0.00	0.02	0.39	0.13	0.80	0.00	0.00	0.02
n	473	473	473	145	145	145	229	229	229

This table reestimates the base-case model with size-matched samples, which only contain savings banks that are larger than the smallest commercial bank, while ensuring that the sample has at least as many non-PCC banks as commercial banks. The models (a), (b), and (c) represent three alternative ways of handling the panel data structure as specified in the two first rows in the bottom section of the table. Performance is measured as return on assets (ROA), which we operationalize as net income after taxes divided by total assets at year end. PCC (Com) is a dummy variable that equals 1 if the bank is a PCC bank (Commercial bank) and zero otherwise. Asset risk is the fraction of assets which is not cash, claims on the central bank, loans to customers, or fixed assets. Liability risk is operationalized as one minus deposits divided by total assets. We assume that the lower these two measures, the smaller the risk. Bank size is the log of the bank's assets in constant 2002 NOK. In the Year dummies row, a yes (no) reflects that we include (do not include) a time dummy to capture time fixed effects. Similarly a yes (no) in the Random effects row means that we use (do not use) random effects estimation to capture firm fixed effects. We report the estimated regression coefficients in bold and its t-statistic in italics. The bottom section of the table shows the adjusted R², F-value (Wald chi² for random effects regressions) with corresponding p-value, and the number of observations for each regression.

Table 11 shows that when we re-estimate the base-case model in the matched sample, the main results persist. As expected, the coefficients for the PCC and the commercial bank dummies have weaker statistical significance due to much smaller samples.

Table 12 re-estimates the base-case model measuring risk by ROA volatility rather than the proxies based on the structure of assets and liabilities. The relationship between bank type and ROA from table 10 is generally upheld, but the economic and statistical significance drops. Also, PCCs are closer to non-PCCs than earlier. For the risk proxy, the relationship between risk and return becomes negative and is stronger in the full period than in the two sub-periods. We suspect this strange relationship reflects two fundamental data problems in the volatility measure. First, a given value of this proxy is only based on three annual observations. This reflects the fact that we only have annual data and a limited time series. Second, the structural relationship between risk and return is unstable over the sample period. This is because volatility is very high and performance is very low during the crisis years. Thus, we prefer the risk measures based on the balance sheet to the one based on ROA volatility.

The fourth robustness test checks what happens if we replace the ROA performance measure used so far with either the gross ROA (which is ROA before funding costs), ROE (return on equity), the profit margin (net income over revenues), or the interest rate margin (net interest income over assets). Table 13 shows the findings, where we simplify the exposition by only reporting the estimates from models with both fixed firm effects and fixed time effects. The results are more consistent with those under ROA from table 10 when we measure performance by gross ROA, ROE or the profit margin than by the interest rate margin. For instance, ROA, gross ROA, ROE, and the profit margin all produce a negative and significant coefficient for the PCC and the Commercial dummies in the full period and the crisis period. They also have a positive, significant sign for asset risk in all cases except two. The only noticeable difference is that unlike ROA, ROE, and the profit margin, gross ROA indicates that commercial banks do significantly better than the two other bank types after the crisis.

For reasons discussed in the beginning of section 5, we consider ROA the more suitable performance measure in our case. Still, it is reassuring that the major conclusions about the relative performance is quite insensitive to how performance is measured.

So far, we have ignored the potential endogeneity problem caused by the fact that poorly performing non-PCC banks may have converted to PCCs to be able to raise new equity. Ignoring this possibility may bias our results towards overestimating the relative performance of non-PCCs. We explore this possibility by testing the base-case model under two alternative samples. First, we pool all savings banks (i.e., non-PCCs and PCCs) into one joint group. Second, we exclude all PCCs from the sample and also non-PCCs that later convert to PCC status. The results are reported in tables 14 and 15, respectively. Overall, we observe no material changes to the base-case results in table 10 in terms of differences between commercial banks and non-PCC banks.

Table 12: The relationship between performance, bank type, risk, and size: Measuring risk by ROA volatility

Independent variable	<u>1985-2002</u>			<u>1988-1992</u>			<u>1993-2002</u>		
	(a)	(b)	(c)	(a)	(b)	(c)	(a)	(b)	(c)
Constant			1.198			0.027			0.566
			<i>5.78</i>			<i>5.11</i>			<i>3.53</i>
PCC	-0.027	-0.215	-0.198	-0.921	-0.806	-0.009	-0.033	-0.189	-0.193
	<i>-0.38</i>	<i>-3.52</i>	<i>-2.61</i>	<i>-3.44</i>	<i>-3.95</i>	<i>-3.30</i>	<i>-0.63</i>	<i>-4.72</i>	<i>-4.26</i>
Com	-0.466	-0.460	-0.730	-1.156	-0.902	-0.012	-0.154	-0.293	-0.207
	<i>-3.90</i>	<i>-5.67</i>	<i>-7.37</i>	<i>-4.12</i>	<i>-4.69</i>	<i>-4.84</i>	<i>-1.29</i>	<i>-4.12</i>	<i>-2.60</i>
ROA volatility	-28.422	-27.161	2.649	-26.734	-28.427	0.079	-5.046	3.408	22.765
	<i>-9.03</i>	<i>-8.77</i>	<i>0.87</i>	<i>-4.65</i>	<i>-5.22</i>	<i>1.38</i>	<i>-1.41</i>	<i>0.85</i>	<i>6.47</i>
Bank size	-0.073	-0.057	-0.021	-0.125	-0.155	-0.001	0.016	0.045	0.030
	<i>-3.60</i>	<i>-4.37</i>	<i>-1.31</i>	<i>-2.54</i>	<i>-4.76</i>	<i>-3.52</i>	<i>0.89</i>	<i>4.22</i>	<i>2.53</i>
Year dummies	yes	yes	no	yes	yes	no	yes	yes	no
Random effects	yes	no	no	yes	no	no	yes	no	no
Adj. R ² , %	38.95	38.74	4.46	46.26	45.80	12.77	25.17	25.68	4.52
F-value (Wald chi ²)	1451.6	75.4	27.1	738.6	77.5	27.5	2778.0	36.1	15.4
Probability of F (chi ²), %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
n	2236	2236	2236	725	725	725	1220	1220	1220

This table reestimates the base-case model, using the volatility of assets returns as a proxy for bank risk. The models (a), (b), and (c) represent three alternative ways of handling the panel data structure as specified in the two first rows in the bottom section of the table. Performance is measured as return on assets (ROA), which we operationalize as net income after taxes divided by total assets at year end. PCC (Com) is a dummy variable that equals 1 if the bank is a PCC bank (Commercial bank) and zero otherwise. The volatility of ROA at time t is calculated as the standard deviation of the bank's ROA in the window from $t-1$ to $t+1$. The volatility for the first year t after a conversion from non-PCC to PCC uses the ROA at $t-1$, which is the last year that the bank was still a non-PCC. Correspondingly, the volatility of a non-PCC bank in the last year before conversion uses the ROA for the first year after conversion. Bank size is the log of the bank's assets in 2002 NOK.

In the Year dummies row, a yes (no) reflects that we include (do not include) a time dummy to capture time fixed effects. Similarly a yes (no) in the Random effects row means that we use (do not use) random effects estimation to capture firm fixed effects. We report the estimated regression coefficients in bold and its t-statistic in italics. The bottom section of the table shows the adjusted R², F-value (Wald chi-squared for random effects regressions) with corresponding p-value, and the number of observations for each regression. The Wald chi² statistic is reported for the random effects regressions.

Table 13: The relationship between performance and bank type: Alternative performance measures

Independent variable	<u>1985 – 2002</u>				<u>1988 - 1992</u>				<u>1993 - 2002</u>			
	Gross return on assets	Return on equity	Profit margin	Interest rate margin	Gross return on assets	Return on equity	Profit margin	Interest rate margin	Gross return on assets	Return on equity	Profit margin	Interest rate margin
PCC	-0.38 <i>-4.70</i>	-11.52 <i>-3.14</i>	-2.64 <i>-3.96</i>	0.25 <i>6.13</i>	-1.48 <i>-4.88</i>	-1.51 <i>-4.63</i>	-11.22 <i>-4.83</i>	0.15 <i>1.49</i>	-0.26 <i>-4.02</i>	-0.97 <i>-1.57</i>	-1.55 <i>-1.95</i>	0.12 <i>2.46</i>
Com	-0.45 <i>-3.09</i>	-28.53 <i>-5.39</i>	-5.92 <i>-5.43</i>	-0.27 <i>-2.04</i>	-2.48 <i>-6.76</i>	-2.74 <i>-6.84</i>	-18.47 <i>-6.77</i>	-0.70 <i>-4.25</i>	0.49 <i>3.44</i>	1.71 <i>1.29</i>	-1.07 <i>-0.60</i>	-0.84 <i>-5.33</i>
Asset risk	1.08 <i>3.92</i>	-1.22 <i>-1.56</i>	15.44 <i>6.82</i>	-0.55 <i>-4.09</i>	0.26 <i>0.37</i>	-0.22 <i>-3.18</i>	13.25 <i>2.43</i>	-0.81 <i>-3.24</i>	1.22 <i>4.79</i>	1.79 <i>9.50</i>	18.38 <i>5.87</i>	0.00 <i>0.01</i>
Liability risk	1.45 <i>6.14</i>	29.16 <i>2.83</i>	4.36 <i>2.29</i>	-2.21 <i>-17.29</i>	5.30 <i>8.29</i>	4.39 <i>6.33</i>	29.66 <i>6.14</i>	-2.63 <i>-11.20</i>	1.07 <i>5.26</i>	-7.13 <i>-3.55</i>	-10.96 <i>-4.33</i>	-1.80 <i>-12.35</i>
Bank size	0.05 <i>1.86</i>	15.11 <i>1.22</i>	-0.19 <i>-1.08</i>	-0.19 <i>-8.28</i>	-0.08 <i>-1.34</i>	1.35 <i>1.74</i>	-1.70 <i>-3.72</i>	-0.11 <i>-3.73</i>	0.08 <i>3.76</i>	-3.01 <i>-1.19</i>	1.10 <i>4.26</i>	-0.09 <i>-3.86</i>
Adj. R ² , %	77.27	3.45	40.23	68.02	30.21	37.2	42.02	63.79	69.79	35.08	24.43	69.23
Wald chi ²	9933	94	1749	23172	359	450	548	616	3916	630	460	19362
Prob. of chi ² , %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
n	2660	2652	2660	2660	738	738	738	738	1362	1362	1362	1362

Using random firm effects and fixed time effects, this table re-estimates the base-case model under four alternative performance measures, which are specified at the top of each column. Gross return on assets is income before funding costs divided by assets, return on equity is net income divided by book equity, profit margin is net income over revenues, and interest rate margin is net interest income over assets. PCC (Com) is a dummy variable that equals 1 if the bank is a PCC bank (Commercial bank) and zero otherwise. Asset risk is the fraction of assets which is not cash, claims on the central bank, loans to customers, or fixed assets. Liability risk is operationalized as one minus deposits divided by total assets. We assume that the larger these two measures, the higher the risk. Size is the log of the bank's assets in constant 2002 NOK. We report the estimated regression coefficients in bold and its t-statistic in italics. The bottom section of the table shows the adjusted R², the Wald chi², its p-value, and the number of observations.

Table 14 : The relationship between performance and bank type: All savings banks vs commercial banks

	<u>1985-2002</u>					<u>1988-1992</u>			<u>1993-2002</u>			
Indep. var.	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
Constant	2.02 <i>5.31</i>	0.07 <i>0.14</i>			7.42 <i>7.00</i>	5.48 <i>3.65</i>			2.13 <i>6.99</i>	1.92 <i>4.85</i>		
Commercial	-0.78 <i>-7.59</i>	-0.90 <i>-5.35</i>	-0.59 <i>-6.47</i>	-0.70 <i>-5.20</i>	-1.72 <i>-5.49</i>	-2.32 <i>-4.96</i>	-1.76 <i>-6.54</i>	-2.35 <i>-5.94</i>	0.05 <i>0.57</i>	0.33 <i>2.70</i>	-0.15 <i>-2.00</i>	-0.04 <i>-0.34</i>
Liability risk	0.54 <i>2.56</i>	0.19 <i>0.72</i>	0.63 <i>3.36</i>	0.76 <i>3.33</i>	2.39 <i>4.01</i>	2.93 <i>3.66</i>	2.94 <i>5.68</i>	4.35 <i>6.22</i>	-0.73 <i>-4.72</i>	-1.12 <i>-6.25</i>	-0.34 <i>-2.39</i>	-0.57 <i>-3.29</i>
Asset risk	0.34 <i>1.51</i>	-0.38 <i>-1.44</i>	2.11 <i>9.28</i>	1.43 <i>5.30</i>	1.64 <i>2.47</i>	-0.10 <i>-0.11</i>	2.53 <i>4.41</i>	1.79 <i>2.30</i>	2.51 <i>12.54</i>	2.16 <i>9.00</i>	2.02 <i>10.90</i>	1.31 <i>5.79</i>
Bank size	-0.04 <i>-2.21</i>	0.04 <i>1.30</i>	-0.08 <i>-5.57</i>	-0.07 <i>-3.17</i>	-0.25 <i>-5.44</i>	-0.18 <i>-2.36</i>	-0.29 <i>-7.27</i>	-0.31 <i>-4.66</i>	0.04 <i>3.22</i>	0.01 <i>0.48</i>	0.04 <i>4.23</i>	0.04 <i>2.49</i>
Year dummies	no	no	yes	yes	no	no	yes	yes	no	no	yes	yes
Random effects	no	yes	no	yes	no	yes	no	yes	no	yes	no	yes
Adjusted R ² , %	3.22	2.19	30.32	30.57	11.88	10.91	35.40	35.27	12.31	11.07	32.25	32.08
F	23.1	35.9	56.1	1710.8	25.9	43.4	51.5	416.9	48.8	156.1	50.8	2762.1
Probability F, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
N	2660	2660	2660	2660	738	738	738	738	1362	1362	1362	1362

The table relates a bank's economic performance to its hypothesized determinants as specified in the leftmost column. Performance is measured as return on assets (ROA), which we operationalize as net income after taxes divided by total assets at year end. Commercial is a dummy variable that equals 1 if the bank is a commercial bank and zero otherwise. Asset risk is the fraction of assets which is not cash, claims on the central bank, loans to customers, or fixed assets. Liability risk is operationalized as one minus deposits divided by total assets. We assume that the lower these two measures, the smaller the risk. Bank size is the log of the bank's assets in constant 2002 NOK. In the Year dummies row, a yes (no) reflects that we include (do not include) a time dummy to capture time fixed effects. A yes (no) in the Random effects row means that we use (do not use) random effects estimation to capture firm fixed effects. We report the estimated regression coefficients in bold and its t-statistic in italics. The bottom section of the table shows the adjusted R², F-value (Wald chi² for random effects regressions) with corresponding p-value, and the number of observations.

Table 15: The relationship between performance and bank type: Non-PCC banks vs commercial banks

Indep. var.	<u>1985-2002</u>				<u>1988-1992</u>				<u>1993-2002</u>			
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
Constant	2.02 <i>5.17</i>	0.38 <i>0.70</i>			6.50 <i>5.97</i>	4.36 <i>2.72</i>			2.63 <i>8.52</i>	2.80 <i>6.90</i>		
Commercial	-0.85 <i>-7.64</i>	-0.85 <i>-4.90</i>	-0.62 <i>-6.33</i>	-0.65 <i>-4.49</i>	-2.03 <i>-6.21</i>	-2.59 <i>-5.22</i>	-2.02 <i>-7.39</i>	-2.54 <i>-5.97</i>	0.14 <i>1.55</i>	0.49 <i>3.72</i>	-0.13 <i>-1.47</i>	0.02 <i>0.17</i>
Liability risk	0.66 <i>2.97</i>	0.21 <i>0.75</i>	0.66 <i>3.42</i>	0.72 <i>2.98</i>	2.49 <i>4.19</i>	2.92 <i>3.55</i>	2.93 <i>5.81</i>	4.33 <i>6.03</i>	-0.59 <i>-3.52</i>	-0.95 <i>-4.84</i>	-0.18 <i>-1.14</i>	-0.38 <i>-1.99</i>
Asset risk	0.25 <i>1.11</i>	-0.39 <i>-1.49</i>	1.88 <i>8.49</i>	1.17 <i>4.40</i>	2.90 <i>4.19</i>	-0.44 <i>-0.48</i>	2.11 <i>3.82</i>	1.36 <i>1.74</i>	2.31 <i>11.99</i>	2.04 <i>8.86</i>	1.84 <i>10.45</i>	1.24 <i>5.76</i>
Bank size	-0.03 <i>-1.82</i>	0.01 <i>0.50</i>	-0.08 <i>-5.24</i>	-0.09 <i>-3.69</i>	-1.93 <i>-3.84</i>	-0.11 <i>-1.33</i>	-0.23 <i>-5.48</i>	-0.27 <i>-3.52</i>	0.00 <i>-0.18</i>	-0.05 <i>-2.50</i>	0.02 <i>1.60</i>	0.00 <i>0.09</i>
Year dummies	no	no	yes	yes	no	no	yes	yes	no	no	yes	yes
Random effects	no	yes	no	yes	no	yes	no	yes	no	yes	no	yes
Adjusted R ² , %	3.81	3.29	34.11	33.72	12.04	11.23	38.40	38.28	12.82	11.33	33.63	33.49
F	25.2	32.7	59.8	1702.6	25.1	41.7	55.8	525.6	43.3	150.9	47.0	2973.2
Probability F, %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
N	2446	2446	2446	2446	704	704	704	704	1182	1182	1182	1182

The table relates a bank's economic performance to its hypothesized determinants as specified in the leftmost column. Performance is measured as return on assets (ROA), which we operationalize as net income after taxes divided by total assets at year end. Commercial is a dummy variable that equals 1 if the bank is a Commercial bank and zero otherwise. Asset risk is the fraction of assets which is not cash, claims on the central bank, loans to customers, or fixed assets. Liability risk is operationalized as one minus deposits divided by total assets. We assume that the lower these two measures, the smaller the risk. Bank size is the log of the bank's assets in constant 2002 NOK. In the Year dummies row, a yes (no) reflects that we include (do not include) a time dummy to capture time fixed effects. A yes (no) in the Random effects row means that we use (do not use) random effects estimation to capture firm fixed effects. We report the estimated regression coefficients in bold and its t-statistic in italics. The bottom section of the table shows the adjusted R², F-value (Wald chi² for random effects regressions) with corresponding p-value, and the number of observations for each regression.

5.4 Alternative explanations

The surprising finding so far is the lacking support for the agency idea that economic performance improves as the owners' control rights become stronger. We will analyze two reasons why, neither of which necessarily refutes the agency logic. First, if the owners are forced to be passive for exogenous reasons, the key governance mechanism in agency theory will be more or less blocked, and owned firms may not differ from ownerless firms in a governance and performance sense. Second, if firms are disciplined by other governance mechanisms than ownership, monitoring by owners may be redundant.

5.4.1 Restrictions on ownership

Corporate governance research has found that performance tends to improve when ownership rights are held directly (personally) rather than indirectly and when some owners have sufficiently strong incentives and power to monitor the management team (Becht et al, 2002). These two ownership characteristics deal with owner types and owner concentration, respectively. Table 16 shows the aggregate equity fraction per owner type in panel (a) and the fraction held by the largest and by the five largest owners in panel (b).

According to panel (a), average direct ownership is roughly 50% in PCC banks and 20% in commercial banks. The corresponding figure in other Norwegian listed firms is 18% over a similar period (Bøhren and Ødegaard, 2006). This high incidence of direct equity holdings suggests that from an agency perspective, ownership has high value in banking. Therefore, being ownerless may be more of a problem in the banking industry than elsewhere.

Agency theory could make the opposite argument from the ownership concentration figures in panel (b), which are low by European standards and considerably below the typical level in other Norwegian industries, which is roughly a mean holding of 30% for the largest owner and 55% for the five largest (Bøhren and Ødegaard, 2006). This low concentration is due to regulation, which mandates special permission from the Ministry of finance to hold more than 10% of a bank's equity. The table shows that 10% is indeed the median largest holding in a commercial bank over the years, reflecting a binding restriction for the typical bank in our sample. The mean exceeds this median because the state held very large stakes in a few banks around the banking crisis and still held one third of the equity in the largest commercial bank at the end of the sample period.

Because the upper bound on the largest holding is binding in the typical commercial bank, it follows that ownership concentration is suboptimally low. Nevertheless, 10% is about five times higher than the average largest holding in US firms, and 10% of the average commercial bank's equity is no trivial amount in terms of implied monitoring incentives. For instance, 10% of equity in the largest and smallest commercial bank in 2002 is NOK 2.5 bill. and 0.2 bill., respectively. Moreover, there are no regulatory restrictions on large owners' ability to create voting coalitions. Thus, we conclude that although regulation forces ownership concentration below its optimal level, this does not prevent owners from active monitoring. The potential for such activity may be suboptimal, but far from non-existent.

5.4.2 Substitutes for ownership

Ownership is redundant if other governance mechanisms can do the job at comparable costs. We consider three such substitutes for ownership functions: (i) capital constraints in ownerless firms, (ii) regulators in all firms, and (iii) competition in all firms.

Table 16: Ownership structure

Panel (a): Owner types										
Year	<u>Government</u>		<u>Persons</u>		<u>Financial</u>		<u>Industrial</u>		<u>International</u>	
	PCC	Com	PCC	Com	PCC	Com	PCC	Com	PCC	Com
1989	3.0	0.0	30.0	23.3	37.7	29.7	13.3	28.5	14.0	16.6
1990	3.3	0.0	28.0	25.4	42.8	31.9	13.2	24.3	10.5	16.8
1991	2.5	3.7	30.5	26.6	48.3	20.0	11.2	35.0	5.2	12.9
1992	2.4	10.8	38.6	24.9	35.8	25.4	18.6	28.9	2.6	8.1
1993	12.0	17.3	37.4	22.3	25.4	25.4	18.8	23.6	4.2	9.3
1994	6.8	13.0	33.5	21.5	28.6	21.4	25.0	32.3	4.3	9.6
1995	5.2	12.3	43.9	21.1	16.9	21.3	29.2	24.8	2.8	18.3
1996	2.1	11.6	50.5	19.8	13.9	26.1	27.0	21.4	4.4	19.3
1997	2.6	11.6	52.6	19.0	13.4	25.9	25.5	22.8	3.9	18.9
1998	2.4	11.6	50.7	18.4	19.5	23.2	22.3	21.1	3.2	23.8
1999	2.0	16.7	55.2	22.2	15.3	23.5	20.9	22.5	4.3	13.8
2000	2.0	15.0	55.3	24.2	15.2	29.8	20.4	21.2	5.1	8.2
2001	2.0	12.4	54.0	24.0	15.4	30.2	19.5	21.0	6.8	10.4
2002	1.8	13.2	55.7	24.2	16.4	24.6	19.5	22.2	4.5	13.8
All	2.9	9.8	48.7	22.4	20.0	25.7	21.3	25.3	5.0	14.9

Panel (b): Ownership concentration								
Year	<u>Largest owner</u>				<u>Five largest owners</u>			
	<u>Mean</u>		<u>Median</u>		<u>Mean</u>		<u>Median</u>	
	PCC	Com	PCC	Com	PCC	Com	PCC	Com
1989	18.3	11.7	9.5	10.0	36.2	33.7	27.0	31.0
1990	9.8	14.8	9.5	13.0	31.3	34.8	31.0	32.0
1991	20.3	14.0	12.5	11.0	39.5	41.7	33.0	43.0
1992	10.0	22.1	11.0	17.5	29.2	47.5	33.0	43.0
1993	16.2	23.8	7.0	11.0	31.4	42.4	25.0	34.0
1994	11.0	19.9	6.5	11.5	26.8	39.6	23.5	32.0
1995	8.6	19.6	6.0	13.0	20.9	35.9	19.0	28.0
1996	6.1	18.6	4.5	10.0	15.7	37.1	13.0	32.0
1997	4.6	17.0	4.5	10.0	13.5	40.9	14.0	44.0
1998	4.8	16.2	5.0	10.0	15.4	37.0	15.0	39.0
1999	6.1	15.7	6.0	9.5	16.4	36.7	18.0	31.5
2000	7.0	16.6	7.0	10.0	17.1	38.4	17.0	28.0
2001	7.4	16.6	8.0	10.0	18.0	36.2	18.0	32.0
2002	7.4	16.6	8.0	10.0	19.0	37.0	19.0	28.0
Average	8.1	17.2	6.0	10.0	20.1	38.3	18.0	35.5

Panel (a) reports the mean, aggregate ownership fraction per firm across five owner types. Panel (b) shows the mean and median ownership fraction for the largest owner and for the five largest owners for PCC banks and commercial banks. We exclude cases where the largest owner holds 90% or more.

The capital constraint argument is based on the fact that unlike commercial banks and PCC banks, non-PCC banks cannot raise outside equity. Any equity-financed growth must come from past earnings. This apparent handicap may turn out to be a competitive advantage for ownerless banks, provided bank managers tend to overinvest in general and that owner monitoring is weak in owned banks. In such a setting, self-serving managers in owned banks can equity-finance overinvestment with both earnings and equity issues, whereas managers of ownerless banks can only use earnings. Therefore, the lacking outside equity option may discipline managers of ownerless banks in similar ways that active owners would. If this mechanism works, we would expect expansive non-PCC banks to finance their growth more heavily with debt than other banks would, particularly when the banking industry is growing fast. Thus, non-PCCs would be closer than other banks to the minimum equity restriction set by regulators.

The start of our sample period coincides with the beginning of a deregulation period for the banking industry. All banks were given more flexibility and better growth opportunities, including the possibility to compete on interest rates. Given the arguments just made, we would expect non-PCC banks to be more capital constrained than other banks under such market conditions. The capitalization ratios in table 17 do not support this idea. The average capitalization ratio is 9.8% in non-PCCs and 7.1% in commercial banks. The difference is statistically significant in 15 out of the 18 years, and the maximum ratio in any year is normally more than twice as large in non-PCCs.²⁴ Thus, because non-PCCs were further away from minimum equity requirements set by regulators than commercial banks and PCCs, we cannot argue that the inability to raise new equity disciplines ownerless non-PCCs in ways that substitute for owner monitoring.²⁵

Notice also that although the free cash flow of a non-PCC bank is automatically kept low because it cannot raise equity, the opposite effect comes from the fact that non-PCCs retain all their earnings because no stakeholder can receive dividends. Hence, the non-PCC is neither disciplined by dividend payments nor by the capital market's scrutiny in equity flotation. Easterbrook (1984) argues that dividend payout and the resulting need to raise new equity for new investments are powerful and easily accessible corporate governance mechanisms.

²⁴ We define the capital coverage ratio as equity plus subordinated debt divided by assets. The legal minimum capitalization ratio uses a particular weighting system for the different asset classes. Because we are unable to reconstruct this exactly, we use unweighted assets. However, as non-PCC are less risky than PCCs and commercials, they would have an even higher relative capitalization ratios if we were to use the correct weighting formula. The upward shift in capitalisation in 1992 and 1993 coincides with the end of the banking crisis and the implementation of the Basel accord. The capitalization ratios are highest in all three bank types around 1995, moving slowly downwards thereafter.

²⁵ Notice also that the capitalisation ratios shifts upwards in 1992 and 1993. This coincides with the end of the banking crisis and the implementation of the Basel accord. The capitalization ratios are highest in all three bank types around 1995, moving slowly downwards thereafter.

Table 17: The capitalisation ratios across years and bank types

Year	<u>Mean</u>			<u>t-statistic for difference in means</u>			<u>Highest (Lowest)</u>					
	(1) Non-PCC	(2) PCC	(3) Com	(1)-(2)	(2)-(3)	(1)-(3)	Non-PCC		PCC		Com	
1985	6.1		5.5			1.3	14.0	(2.4)			9.2	(3.9)
1986	5.8		6.1			-0.7	14.0	-			9.9	(3.5)
1987	7.0		5.5			3.5*	18.3	(2.3)			8.7	(3.4)
1988	6.8	5.8	5.0	1.3	0.6	1.8*	17.0	(-1.6)	7.2	(4.7)	7.9	(-6.8)
1989	7.4	5.4	4.9	3.4*	0.4	1.9*	17.4	(3.3)	7.6	(2.9)	7.6	(-11.5)
1990	7.9	4.3	5.8	2.5*	-1.0	3.7*	17.5	(1.0)	7.5	(-3.5)	8.3	(2.9)
1991	7.7	5.6	6.1	2.9*	-0.6	2.6*	18.0	(-16.2)	8.7	(2.7)	9.7	(4.2)
1992	10.7	6.7	7.6	4.0*	-0.8	4.3*	19.3	(4.7)	10.4	(0.4)	12.3	(4.8)
1993	11.5	9.1	11.3	3.6*	-1.1	0.1	21.5	(6.3)	11.0	(6.1)	28.6	(5.8)
1994	12.3	9.2	9.5	6.2*	-0.5	6.9*	22.4	(5.8)	11.9	(7.7)	11.3	(8.3)
1995	13.0	10.2	10.0	3.8*	0.3	5.1*	24.2	(6.3)	16.5	(7.4)	12.8	(8.6)
1996	13.2	10.9	8.8	2.9*	2.5*	7.8*	26.1	(6.5)	19.1	(8.5)	10.2	(6.9)
1997	12.9	10.9	8.9	2.2*	2.2*	7.4*	26.4	(7.3)	19.0	(7.6)	10.1	(6.8)
1998	12.9	10.8	9.3	2.8*	1.7*	5.5*	26.0	(7.2)	18.2	(5.5)	10.9	(6.5)
1999	12.8	10.6	8.7	3.4*	1.9*	4.6*	26.9	(8.3)	17.7	(6.7)	10.6	(6.7)
2000	12.5	10.0	8.8	4.3*	1.2	3.9*	26.6	(7.8)	17.3	(6.3)	10.9	(6.7)
2001	12.0	9.6	8.1	4.5*	1.7*	4.5*	26.2	(7.3)	16.1	(7.1)	9.5	(6.8)
2002	11.5	9.2	7.7	4.4*	1.3	3.4*	26.7	(6.9)	15.9	(5.3)	8.8	(6.7)
Average	9.8	9.4	7.1	3.5	0.7	3.8	21.6	(3.6)	13.6	(5.0)	11.0	(4.1)

The table shows distributional characteristics of the capitalisation ratio, which we operationalize as book equity plus subordinated loans divided by the book value of the assets. The averages at the bottom of the table are based on the pooled sample.

What about the banking supervisor? This monitoring activity occurs according to the same, detailed rules in all banks regardless of organizational form. Therefore, it may be argued that a high-quality banking inspection makes owners redundant. We disagree because the banking inspector's job is not to maximize the value of the bank, but to limit its downside risk.²⁶ This means the existence of a banking regulator may explain why depositors dare to leave their money with a bank whose owners benefit from risk-taking. It may also explain why most banks stay out of bankruptcy. However, banking inspection cannot explain why a given bank or a given type of banks is more profitable than others. This argument is consistent with a study of 244 banks in 44 countries, which finds no convincing relationship between bank valuation and the way banks are regulated and supervised by public authorities (Caprio et al, 2003). Just like we concluded for regulatory ownership restrictions in all banks and the nonavailability of outside equity for non-PCC banks, we think the banking supervisor cannot explain why ownerless banks do so well.

Competition is our third explanation of why ownerless firms are not outperformed by owned firms. The general idea is that more competition reduces admissible inefficiency in any enterprise, regardless of its organizational form. Stronger competition moves product prices closer to marginal production costs in the most efficient firm, making it harder for any firm to survive. Conversely, monopoly power enables inefficient firms to remain in the market.

The theory of agency costs and competition shows that unlike what was originally thought (Leibenstein, 1966; Machlup, 1967; Hart, 1983), more competition does not necessarily imply increased effort by value-maximizing firms (Scharfstein, 1988; Schmidt, 1997). Schmidt (1997) shows that agents with firm-specific human capital always have stronger incentives to work harder the stronger the competition. This happens because more competition reduces profits, thereby increasing the liquidation risk and reducing the value of the agent's firm-specific investment. However, because more competition produces lower product prices and thereby erodes the value of cost-reducing effort, it may be optimal for the principal to induce less effort by the agent. The net effect of these two forces is ambiguous, and the empirical IO literature tends to find an inverted U-shaped relationship between increased competition and innovation. The strongest effect of competition on innovative activity occurs in oligopolistic markets, such as computers and automobiles.

This logic means that if competition disciplines the firm, owner monitoring and competition may be thought of as substitute governance mechanisms (Shleifer and Vishny, 1997). Therefore, monitoring by strong, incentivized owners will only matter for performance when competition is low. This implies that the relationship between organizational form and performance is weaker the stronger the competition. This idea has received some support by the very limited existing evidence on this issue (Palmer, 1973; Masulis et al, 2005).

We are not saying that governance quality is unimportant in competitive markets. Rather, we say the opposite. When competition is low, it takes active owners to ensure the firm has a value-maximizing governance system, such as competent boards and well-functioning incentive contracts with management. However, the firm may survive even if such owner qualities are missing. In contrast, firms facing strong competition go bankrupt unless they have installed value-maximizing governance

²⁶ The Norwegian Financial Supervisory Authority states that its main purpose is 'to ensure that financial enterprises and markets function securely and efficiently in the best interest of society and users of financial services...' (Kreditilsynet, 2002).

systems. If they have weak or even no owners, the competitive pressure and the agents' incentives to survive jointly create the urge to establish value-maximizing governance systems. So, governance (including ownership structure) and performance are unrelated when competition is strong because all firms have optimal governance installed. In contrast, governance and performance are systematically related when competition is weak because not every firm needs optimal governance to survive (Demsetz, 1983).

Competitive pressure may come from the firm's product market, labor market, and the market for corporate control. The latter market cannot explain our finding, as the most efficient organizational type (non-PCC banks) cannot be traded. We doubt that labor market competition does the job, since unemployment was only 4.2% on average and never exceeded 6.0% in the sample period.²⁷ However, since the local demand for management in financial institutions in smaller locations may be thin, managers of savings banks in particular may be disciplined by potential loss of firm-specific human capital if the bank is underperforming.

This leaves us with product market competition as the premier candidate for rationalizing our results.. To substantiate this explanation, notice first that all banks in our sample have access to the same product market, and that there are no major economic or regulatory barriers to entry. Second, product market competition in Norwegian banks seems relatively strong internationally. Table 18 shows market concentration in banking across 16 European countries from 1990 to 2002. We measure market concentration as total assets in the five largest banks divided by total assets in all banks.

Table 18: Market concentration in European banking 1990-2002

Country	1990	1997	1998	1999	2000	2001	2002	Average
Austria	35	44	42	41	43	45	46	42
Belgium	48	54	63	76	75	78	82	68
Denmark	76	70	71	71	60	68	68	69
Finland	53	88	86	86	87	80	79	80
France	42	40	41	43	47	47	45	43
Germany	14	17	19	19	20	20	20	18
Greece	83	56	63	67	65	67	67	67
Ireland	44	41	40	41	41	43	46	42
Italy	19	25	25	26	23	29	31	25
Luxembourg		23	25	26	26	28	30	26
Netherlands	73	79	82	82	81	83	83	80
Norway	68	51	50	55	52	50	50	54
Portugal	58	46	45	44	59	60	60	53
Spain	35	32	35	41	46	45	44	40
Sweden		58	56	56	57	55	56	56
UK		24	25	28	28	29	30	27
Average	50	47	48	50	51	52	52	49

Market concentration is measured as total assets for the five largest banks divided by total assets for all banks. Source: Central Bank of Norway.

²⁷ Source: Statistics Norway.

The table documents large variations in competitive pressure across countries. For instance, concentration is very high in Finland and the Netherlands, where the five largest banks control 80% of the banking assets. At the opposite extreme of low concentration, Italy has 25% and Germany has 18%. Market concentration in Norwegian banks is medium in a European context and consistently lower than in other Scandinavian countries. Moreover, whereas average concentration across all countries has stayed quite constant over time, concentration in Norwegian banking drops in the early part of the period and stays close to the average European level thereafter.

6. Summary and conclusions

Economists tend to take for granted that when ownership is separated from control, monitoring by those who own the capital invested will change the firm's behavior and improve its performance. Similarly, we seldom question the conventional wisdom that stockholders will lose wealth if they internalize welfare effects of their actions on other stakeholders, such as employees and customers. This paper challenges these two ideas by analyzing empirically how firms with widely different stakeholder structures choose their assets and liabilities and how they perform economically under different market conditions. In particular, we explore whether ownership is critical for governance by comparing ownerless firms with multiple objectives to profit-maximizing firms owned by stockholders.

Our results show that firm behavior differs across organizational forms in ways predicted by a stakeholder theory of decision-making under asymmetric information. In particular, the stronger the control rights of the owners, the larger and riskier the firm. This is consistent with findings on depositor-owned S&Ls vs. stockholder-owned commercial banks in the US.

In contrast, we find no support for the agency idea that economic performance is better the stronger the control rights of capital providers and the more profit-oriented the firm's objective function. After having accounted for differences in risk, size, fixed firm effects, and fixed industry effects, ownerless firms perform better in crisis times and as well in normal times as firms partially or fully controlled by owners. A study of governance activity in Spanish banks over roughly the same period provides some support to our result, as average ROA was higher in ownerless banks than in stockholder-owned commercial banks (Crespi et al, 2004, table 2).

Nevertheless, these results do not necessarily falsify the agency prediction that owners who monitor actively create economic value. Neither do they imply that because other disciplining mechanisms than ownership can do the job as efficiently in ownerless firms, owners are redundant in owned firms. The fact that both organizational forms have coexisted in our sample over many years supports this argument. It may reflect Hansmann's (1996) insight that whether or not ownership is the superior organizational form is determined by characteristics of the stakeholder structure and the product market. Therefore, these characteristics determine whether control rights and cash flow rights should be put in the hands of stockholders, other stakeholders, or some combination of the two.

Economic theory would argue that regardless of industry and regardless of stakeholder structure, firms with potential agency problems may survive if there is sufficient disciplining pressure from other sources than ownership. In particular, ownerless firms may be disciplined by mechanisms that are viable alternatives to the lacking monitoring by owners. We find no convincing evidence that this substitute role is played neither by regulation nor by the non-availability of outside equity-financing for ownerless banks. Our evidence suggests that consistent with theoretical predictions (Schmidt, 1997), product market competition and the threat of lost human capital under bad performance jointly force ownerless firms to establish optimal corporate governance systems. Ownership is not critical for performance when competition is strong.

If the agency problem is taken care of by substitutes for ownership, what remains to rationalize is why the multiple-objective firms in our sample are not losing out to firms with profit maximization as their only goal. Our findings support Allen et al. (2006) on this point, who predict that profits may increase when the firm adopts a multi-dimensional objective function that recognizes the interests of several stakeholders. This suggests corporate governance research may benefit from

reconsidering the conventional wisdom on the role of stakeholders in general and stockholders in particular.

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Appendix

Table A1: Equally weighted asset structure

Year	<u>Fixed assets</u>			<u>Downpayment contracts</u>			<u>Short-term assets</u>			<u>Overdraft facilities</u>			<u>Building loans</u>			<u>Other loans</u>			<u>Losses</u>		
	Non-PCC	PCC	Com	Non-PCC	PCC	Com	Non-PCC	PCC	Com	Non-PCC	PCC	Com	Non-PCC	PCC	Com	Non-PCC	PCC	Com	Non-PCC	PCC	Com
1985	2.7		2.7	54.5		0.7	32.7		25.2	6.7		13.2	5.8		4.6	-		55.9	-2.5		-2.3
1986	2.9		2.9	60.1		18.0	27.1		20.9	7.4		13.0	5.2		4.5	-		42.9	-2.7		-2.2
1987	2.9		2.5	64.0		36.5	23.0		21.6	7.6		12.1	5.4		3.9	0.0		24.8	-2.9		-1.5
1988	2.9	2.5	3.0	57.0	63.7	35.9	23.7	20.9	20.4	7.6	7.8	10.6	4.7	6.6	3.8	6.9	0.1	28.0	-2.8	-1.6	-1.7
1989	3.0	3.0	3.4	59.2	68.2	42.7	23.6	15.6	20.5	7.1	8.4	8.6	3.7	5.0	2.6	6.4	2.0	23.7	-2.8	-2.1	-1.5
1990	2.7	2.9	3.1	66.4	75.0	43.2	22.7	13.9	16.7	6.7	7.0	5.7	2.9	3.0	1.8	1.4	-	31.0	-2.8	-1.8	-1.5
1991	2.6	2.8	3.2	67.1	77.1	41.0	23.2	12.4	15.4	6.2	7.0	4.8	2.1	2.4	1.3	1.7	0.0	36.1	-2.7	-1.6	-1.7
1992	2.4	2.6	3.3	69.9	80.0	63.8	22.0	13.3	17.7	5.9	7.6	5.8	1.6	2.0	1.0	0.1	0.0	12.0	-1.8	-5.4	-3.7
1993	2.2	2.6	3.1	72.3	80.6	67.1	20.1	13.5	16.9	5.3	5.9	3.9	2.1	1.6	0.8	0.0	0.0	12.9	-2.0	-4.3	-4.7
1994	6.4	3.4	2.7	72.3	81.2	56.2	14.6	11.5	14.8	5.1	4.9	4.1	1.6	2.1	0.8	2.0	0.0	24.3	-1.8	-3.2	-3.0
1995	1.9	2.5	2.2	74.7	81.1	61.8	18.1	11.4	13.9	5.2	5.1	5.2	1.8	2.0	1.2	0.0	0.0	17.9	-1.8	-2.2	-2.3
1996	1.8	2.2	1.9	76.4	79.6	63.2	16.5	13.1	13.6	5.0	4.5	5.6	1.8	2.1	1.3	0.0	0.0	16.1	-1.6	-1.6	-1.7
1997	1.7	1.9	1.6	78.8	79.4	58.4	14.3	13.3	14.1	4.6	4.7	7.0	2.0	2.0	2.1	0.0	0.0	18.3	-1.4	-1.3	-1.4
1998	1.6	1.9	1.5	79.7	80.1	48.4	13.6	12.3	14.1	4.5	4.7	4.5	1.9	2.2	2.0	0.0	0.0	30.9	-1.4	-1.2	-1.4
1999	1.5	1.8	1.8	80.4	79.8	43.3	13.5	13.0	18.1	4.2	4.4	4.3	1.7	2.1	1.1	0.0	0.0	32.4	-1.4	-1.1	-0.9
2000	1.5	1.7	1.6	81.1	79.8	69.2	13.4	13.0	16.8	3.9	4.2	4.8	1.5	2.4	1.1	0.0	0.1	7.3	-1.5	-1.1	-0.9
2001	1.4	1.8	1.3	81.9	80.4	78.2	12.7	11.9	13.9	3.8	4.7	4.0	1.7	2.3	1.6	0.0	0.0	1.7	-1.5	-1.1	-0.7
2002	1.4	1.5	1.4	83.0	80.6	78.4	12.1	12.5	15.6	3.5	4.4	3.1	1.6	2.4	0.5	0.0	0.0	1.6	-1.5	-1.4	-0.6
Average	2.4	2.3	2.4	71.0	77.8	50.3	19.3	13.4	17.2	5.6	5.7	6.7	2.7	2.7	2.0	1.0	0.2	23.2	-2.0	-2.1	-1.9

All figures are reported as percent of total assets. The total average weights the years equally. Fixed assets are buildings and investments in affiliated companies. Short-term assets are cash, cash equivalents and securities held for trading. Downpayment contracts are loans that are amortized (gradual repayment of the principal), e.g. mortgages. Overdraft facilities are trade credits and other fixed limit loans. Building loans are fixed limit loans. Other loans include all other loans, e.g. credit card debt and leasing. Losses are allowances for losses on all loan portfolios.

Table A2: Equally weighted liability structure

Year	<u>Equity</u>			<u>Subordinated debt</u>			<u>Due to customers</u>			<u>Due to banks</u>			<u>Other liabilities</u>		
	Non-PCC	PCC	Com	Non-PCC	PCC	Com	Non-PCC	PCC	Com	Non-PCC	PCC	Com	Non-PCC	PCC	Com
1985	6.1		5.1	0.0		1.2	86.8		64.5	3.9		16.2	3.1		13.0
1986	5.8		5.7	0.0		1.4	83.2		49.1	7.4		24.0	3.5		19.8
1987	7.0		4.6	0.0		1.7	80.7		47.3	9.9		22.7	2.5		23.6
1988	6.8	3.8	3.4	0.0	2.0	2.2	79.7	61.6	42.8	10.8	24.6	23.8	2.7	8.0	27.8
1989	7.3	4.3	2.8	0.1	1.1	2.8	81.8	65.4	44.1	8.6	21.9	21.6	2.2	7.3	28.8
1990	7.7	3.3	4.0	0.1	1.0	2.2	83.8	69.8	38.2	6.2	17.0	19.2	2.1	8.9	36.3
1991	7.6	3.9	3.1	0.1	1.8	3.3	84.6	72.9	37.7	5.7	13.7	14.5	2.0	7.7	41.4
1992	10.6	4.5	4.4	0.1	2.2	3.3	83.2	79.0	42.2	4.3	9.3	13.9	1.7	5.0	36.2
1993	11.4	6.6	6.7	0.1	2.5	4.7	83.4	76.5	40.0	3.1	8.3	11.7	1.9	6.1	36.8
1994	12.1	7.1	6.7	0.1	2.2	2.8	82.4	75.5	44.7	3.3	5.1	11.3	2.0	10.1	34.6
1995	12.9	8.7	7.2	0.1	1.4	2.8	82.3	73.1	47.3	2.7	6.1	11.1	1.9	10.6	31.6
1996	13.2	9.4	6.2	0.0	1.5	2.6	81.4	70.9	42.7	3.1	5.3	13.1	2.2	12.9	35.4
1997	12.9	9.3	5.8	0.0	1.6	3.1	79.2	66.4	43.4	4.4	6.5	16.2	3.5	16.2	31.5
1998	12.8	9.7	6.3	0.0	1.1	3.0	77.8	65.7	41.8	5.2	8.0	14.9	4.1	15.6	34.0
1999	12.8	9.5	6.4	0.0	1.0	2.3	76.3	63.6	41.4	6.4	9.3	13.1	4.5	16.5	36.8
2000	12.4	8.8	6.3	0.1	1.2	2.4	74.6	62.0	41.3	5.6	8.5	14.0	7.4	19.5	35.9
2001	11.8	8.2	6.0	0.1	1.5	2.1	73.9	58.6	41.4	5.5	9.1	13.2	8.6	22.6	37.3
2002	11.2	7.5	6.0	0.3	1.6	1.7	73.6	59.4	45.4	4.9	7.5	7.7	10.0	24.0	39.1
Average	10.1	7.0	5.4	0.1	1.6	2.5	80.5	68.0	44.2	5.6	10.7	15.7	3.7	12.7	32.2

All figures are reported as percent of total assets. The total average weights the years equally. Subordinated debt includes debt that can be regarded as capital for capital requirement calculations. Due to customers includes regular deposits from customers. Due to banks is inter-bank loans including loans from the central bank. Other liabilities includes securities issued.

Table A3: The interest rate margin

Year	1 Non-PCC	<u>Mean</u>		t-statistic for difference <u>in means</u>		
		2 PCC	3 Com	1-2	2-3	1-3
1985	4.1		3.0			5.19 *
1986	4.4		3.1			6.42 *
1987	4.6		2.8			7.30 *
1988	4.4	3.7	2.7	1.98 *	1.94 *	6.33 *
1989	4.8	4.4	2.9	2.18 *	3.94 *	5.88 *
1990	4.7	4.3	2.1	1.55 *	6.55 *	9.43 *
1991	4.5	4.3	2.1	0.75	5.83 *	8.61 *
1992	4.7	4.5	2.2	0.85	5.99 *	8.23 *
1993	4.7	4.8	2.5	-0.91	6.29 *	6.38 *
1994	4.4	4.2	2.3	1.36	5.59 *	6.47 *
1995	4.0	3.5	2.2	2.50 *	3.36 *	5.87 *
1996	3.7	3.3	1.9	3.66 *	5.80 *	7.54 *
1997	3.4	3.0	2.0	3.58 *	5.00 *	7.11 *
1998	3.4	3.1	2.1	2.50 *	4.32 *	5.88 *
1999	3.4	3.1	1.8	2.56 *	4.70 *	6.41 *
2000	3.2	2.8	1.8	3.27 *	4.28 *	6.48 *
2001	3.1	2.7	1.9	2.62 *	2.55 *	3.82 *
2002	3.0	2.6	1.7	2.92 *	1.93 *	2.88 *
Average	4.1	3.3	2.5	2.09 *	4.54 *	6.46 *

The table reports the equally weighted interest rate margin for the population of Norwegian banks. The interest rate margin is defined as net interest income over total assets. t-values marked with a * reflects a difference between two means which is statistically different from zero at the 5% level. Non-PCC banks are ownerless foundations (pure savings banks). PCC banks used to be pure savings banks that later transformed themselves into PCC banks by issuing equity securities to the general public in terms of Primary Capital Certificates (PCC).

Table A4: The profit margin

Year	1 Non-PCC	Mean	3 Com	t-statistic for difference		
		2 PCC		in means		
				1-2	2-3	1-3
1985	3.7		3.0			1.68 *
1986	3.6		2.6			2.19 *
1987	3.9		0.6			3.96 *
1988	2.8	-0.9	-5.8	3.45 *	1.03	1.84 *
1989	4.6	-1.1	-2.5	2.54 *	0.25	1.40
1990	3.8	-6.2	-0.9	1.43	-0.72	1.96 *
1991	3.0	-8.2	-14.0	2.16 *	0.73	2.66 *
1992	21.9	0.4	-5.4	3.02 *	0.63	4.46 *
1993	12.8	13.0	8.4	-0.10	1.82	3.85 *
1994	13.9	11.8	10.8	1.45	0.38	1.29
1995	15.7	3.4	14.0	1.28	-1.05	0.61
1996	8.9	7.0	11.9	1.05	-1.23	-0.83
1997	16.2	12.8	15.8	1.41	-1.03	0.19
1998	11.5	11.2	9.6	0.27	1.18	1.83 *
1999	13.4	12.8	12.2	0.50	0.36	0.75
2000	14.3	12.4	11.6	1.87	0.53	2.01
2001	9.0	8.0	10.4	0.96	-1.32	-0.85
2002	6.6	2.9	8.5	1.58	-2.43 *	-2.19 *
Average	8.9	7.3	2.8	1.53	-0.06	1.49

The table reports the equally weighted profit margin for the population of Norwegian banks. The profit margin is defined as net income over total income. t-values marked with a * reflects a difference between two means which is statistically different from zero at the 5% level. Non-PCC banks are ownerless foundations (pure savings banks). PCC banks used to be pure savings banks that later transformed themselves into PCC banks by issuing equity securities to the general public in terms of Primary Capital Certificates (PCC).

Table A5: The gross return on assets

Year	<u>Mean</u>			<u>t-statistic for difference in means</u>		
	1 Non-PCC	2 PCC	3 Com	1-2	2-3	1-3
1985	5.7		6.0			-1.81 *
1986	6.4		6.8			-1.39
1987	7.3		6.7			2.59 *
1988	7.3	7.4	6.8	-0.23	0.67	0.63
1989	6.9	6.7	6.4	0.66	0.39	0.58
1990	6.4	5.4	6.5	1.08	-1.13	-0.35
1991	5.9	5.0	5.4	1.55	-0.37	0.48
1992	7.8	5.7	6.1	2.72 *	-0.37	1.88 *
1993	5.4	5.7	6.4	-0.92	-1.05	-1.62
1994	3.7	3.7	4.9	-0.03	-2.97 *	-3.13 *
1995	3.8	3.4	5.1	0.89	-3.44 *	-5.35 *
1996	3.0	2.9	4.3	0.77	-3.49 *	-3.73 *
1997	2.9	2.6	3.8	1.03	-4.57 *	-6.77 *
1998	3.3	3.4	4.3	-0.26	-4.09 *	-5.39 *
1999	4.2	4.1	4.6	0.06	-1.23	-1.34
2000	4.1	4.1	4.7	0.14	-3.68 *	-5.71 *
2001	4.3	4.3	5.0	-0.22	-2.84 *	-3.67 *
2002	4.0	3.9	4.3	0.63	-0.65	-0.47
Average	5.3	4.1	5.8	0.53	-1.92 *	-1.92 *

The table reports the equally weighted gross return on assets (gross ROA) for the population of Norwegian banks. Gross ROA is defined as net income plus tax-adjusted interest rate costs over total assets.. t-values marked with a * reflects a difference between two means which is statistically different from zero at the 5% level. Non-PCC banks are ownerless foundations (pure savings banks). PCC banks used to be pure savings banks that later transformed themselves into PCC banks by issuing equity securities to the general public in terms of Primary Capital Certificates (PCC).

Table A6: The return on equity

Year	1 Non-PCC	<u>Mean</u>		t-statistic for difference <u>in means</u>		
		2 PCC	3 Com	1-2	2-3	1-3
1985	6.8		8.8			-1.66
1986	8.2		8.3			-0.07
1987	7.5		-0.3			2.15 *
1988	7.1	-4.6	4.7	2.46 *	-0.79	0.22
1989	8.3	-4.8	11.0	1.80 *	-1.78 *	-0.52
1990	3.2	31.1	-46.1	-0.91	1.42	1.10
1991	5.4	-71.2	-125.5	1.67	0.56	1.54
1992	24.6	-164.5	-142.8	1.07	-0.11	1.74 *
1993	13.0	25.2	16.6	-2.25 *	1.50	-1.75 *
1994	9.7	14.9	14.8	-2.35 *	0.02	-1.54
1995	10.2	11.6	16.8	-0.47	-1.10	-1.85 *
1996	5.2	7.2	14.3	-1.59	-1.62	-2.13 *
1997	8.6	10.3	17.8	-1.12	-2.69 *	-3.94 *
1998	6.7	9.0	11.8	-2.17 *	-1.56	-3.46 *
1999	9.0	12.1	14.3	-3.00 *	-1.21	-3.47 *
2000	9.8	12.0	14.3	-2.04 *	-1.43	-3.86 *
2001	6.4	8.1	14.0	-1.35	-3.79 *	-7.63 *
2002	4.3	1.1	10.7	0.80	-2.26 *	-3.41 *
Average	8.5	-0.5	-12.1	-0.63	-0.99	-1.59

The table reports the equally weighted return on equity for the population of Norwegian banks. The return on equity is defined as net income divided by total equity. t-values marked with a * reflects a difference between two means which is statistically different from zero at the 5% level. Non-PCC banks are ownerless foundations (pure savings banks). PCC banks used to be pure savings banks that later transformed themselves into PCC banks by issuing equity securities to the general public in terms of Primary Capital Certificates (PCC).

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