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AUTHOR

GIOVANNI FERRI
LUMSA University Rome
g.ferri@lumsa.it

PANU KALMI
University of Vaasa, Finland
panu.kalmi@uwasa.fi

EEVA KEROLA
Dept. of Economics, AALTO University School of Business, Helsinki
eeva.kerola@aalto.fi

Organizational Structure and Exposure to Crisis among European Banks: Evidence from Rating Changes

ABSTRACT

The Great Crisis that started in 2007 deeply affected banks throughout Europe. Using the assessments of the two global agencies that publish ratings of the financial strength of individual banks, we study whether the crisis hit European banks differently depending on their organizational structure. We analyze the changes in the ratings during the crisis and how they are related to bank ownership. Our results lend support to the hypothesis that stakeholder banks, especially cooperative banks, were downgraded to a lesser degree than shareholder banks. However, the results differ somewhat across the rating agencies. We also discuss the sources of ratings disagreements in the paper. Our paper is among the first presenting statistically based evidence on the relative merits of different organizational structures during the recent financial and economic crisis.

KEY-WORDS

EUROPEAN BANKING; SHAREHOLDER BANKS; COOPERATIVE BANKS; SAVINGS BANKS; PERFORMANCE; CREDIT RATING AGENCIES

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1. Introduction

Stakeholder-value oriented banks (cooperative and savings banks) are prevalent in European banking markets. In many countries, stakeholder-oriented banks have a larger market share than profit-maximizing banks. Although these banks are common in many markets, their ownership structure prevents takeovers and has often been viewed as an impediment to economic efficiency. The financial and economic crisis that started in 2007 has instigated a lively debate about the merits of different ownership structures within the banking industry. However, it is yet unclear what general lessons there are on the comparative performance of different types of banking organizations, as there are successes and failures among both stakeholder-value oriented and profit-maximizing banks.

The novel question that we tackle here is examining the rating differences across different ownership structures and whether and to what extent the main credit ratings agencies changed their views across ownership structures in response to the crisis. The evidence comes from the bank financial strength ratings from two of the three major rating agencies (Moody's and Fitch). This type of data is less susceptible to certain types of measurement error than standard financial statements, and it is more readily available as the crisis unfolds. Bank financial strength ratings are well suited for analyzing bank strength because they are supposedly not confounded by the likelihood of government support to financial organizations. Ratings are also relevant because they are a major determinant of the cost of raising funds for banks. However, there are certain concerns regarding ratings (rater subjectivity, potential bias towards profit-maximization objectives) that we discuss in the paper as well.

In addition, in this paper, we build upon previous work (Ferri *et al.*, 2013) in making a clear differentiation between different types of stakeholder-value oriented banks. We divide the stakeholder-value banks into cooperative groups, individual cooperative banks, private savings banks, and public savings banks, where the term "public" refers to the fact that these banks are often sponsored by public sector entities such as a region, county or municipality (Ayadi *et al.*, 2009; Bülbül *et al.*, 2013).

Our findings suggest that ownership structure does influence the development of ratings and particularly that cooperative groups were downgraded less during the crisis than other banks. However, clear differences also appear across the rating agencies. Therefore, we proceed to analyze the determinants of ratings disagreements. We find evidence that one of the agencies gives systematically higher ratings to certain types of stakeholder banks than the other, while the evidence that random disagreements depend on ownership is more limited. This study may be the first to address the question of how rating disagreements are related to the ownership structures of banks.

The rest of the paper is structured as follows. In the next section, we summarize the debate on the relative performance of shareholder *versus* stakeholder banks and discuss how we can use the explicit assessments of the credit rating agencies to evaluate the relative performance of these bank categories. In section 3, we present our empirical approach and data. In section 4, we present descriptive statistics and explain how ratings have changed over time. In section 5, we present the regressions concerning the rating changes and in section 6, we present the analysis concerning rating disagreements. Section 7 concludes the paper.

2. The performance of stakeholder-value oriented banks in the crisis

The viability of different organizational forms is most clearly tested in times of crises, when the mortality of banking organizations far exceeds that of normal times. There are several reasons why ownership structure could be a determinant of performance in a crisis situation. First of all, profit-maximizing banks face a problem that has variously been called "risk shifting" or "asset substitution": when management acts as a faithful agent of the owners (shareholders), they have incentives to choose investment policies that are excessively risky from the perspective of the depositors (John *et al.*, 1991; Hermalin and Wallace, 1994; Esty, 1997). Customer-owned or non-profit financial institutions internalize the interests of depositors and thus do not have incentives for excessive risk taking; this should be counted as an advantage in a crisis situation (e.g., Rasmusen, 1988; Alexopoulos and Goglio, 2009; Coco and Ferri, 2010). An additional advantage of stakeholder-value oriented institutions is that they typically have unusually loyal customers, and a large part of their liabilities is composed of deposits (e.g., Amess, 2002). This feature is useful in a crisis situation, where alternative sources of short-term funding often become unavailable. However, a clear disadvantage of stakeholder-value oriented banks in crises is their inherent difficulty in raising equity capital, a handicap that has sometimes led to conversions to shareholder ownership (Fonteyne, 2007).

There is evidence, for instance from the US during the Great Depression of the 1930s or the Savings & Loan Crisis of the 1980s, that stakeholder-value oriented organizations may show greater resilience in crises (Rasmusen, 1988; Hermalin and Wallace, 1994). However, there are also examples where organizational diversity has been reduced in a crisis due to the collapse of stakeholder-value oriented banks; examples include Swedish cooperative banks and Finnish savings banks in the Nordic banking crises of the early 1990s (Kalmi, 2012; Körnert, 2012).

Similarly, the recent crisis that started in 2007 has provided a fairly mixed response regarding the performance of stakeholder banking *vis-à-vis* profit-maximizing banks. While there is not yet much academic literature, journalists have been quick to comment on the issue. Thus, on September 2, 2009, the *Financial Times* ran a long article entitled "Mutual Suspect", expressing doubts regarding the ability of cooperative banks, especially building societies, to address the crisis. Almost as a response to that article, *The Economist* published an article on January 21, 2010 entitled "Mutual Respect", highlighting the good performance of European cooperative banks in the crisis. In addition, Birchall and Hammond Ketilson (2009), Birchall (2013) and several articles by Mooij and Boonstra (2012) have stressed the resilience of cooperative banks during the crisis. Other stakeholder-value oriented organizations, especially the German central public savings banks (*Landesbanken)* and the Spanish private savings banks (*cajas*), which have been subsequently forced to convert into joint-stock ownership, have been the focus of much critical discussion (e.g., Hau and Thum, 2009; IMF, 2012).

Because it is always possible to find examples of both success stories and failures among all types of organizations in a crisis, it is essential to move from case examples to statistical analysis. In this paper, we propose that ratings data may provide interesting evidence on the comparative performance of different organizational types.

There are several advantages in using bank ratings to compare bank performance, which we may best appreciate as contrasted to the main alternative, financial statement analysis. When analyzing data coming from a large number of observations, the analyst often does not have all of the relevant information that affects the balance sheet. For instance, she may have difficulty taking into account the impact of major acquisitions or divestments. Additionally, banks may strategically manipulate the timing of reported write-downs and inventory valuations. Because analysis is typically based on annual data, income statements also reflect historical development with a lag.

Bank ratings are based on publicly available information, such as financial statements, and also on a host of additional information, some of which is collected from non-public sources. In essence, ratings consist of a large number of case studies on performance. In this way, ratings embody much more than reported financial information alone. For this reason, from an information-theoretic perspective, ratings should be preferred over financial statements as a performance measure. Furthermore, they reflect the current, rather than a historical, situation[1].

The best known ratings for banks are those issued by the three largest credit rating agencies (CRAs: S&P's, Moody's and Fitch). Interpreting bank ratings requires some attention. As argued convincingly by Alessandri and Haldane (2009), the recent crisis has shown the large extent to which the survival of banks depends on implicit or explicit government guarantees providing their bailouts. Thus, even the ratings issued on banks by the CRAs may incorporate the extent of government support. Because the eagerness of the government to provide support is supposedly skewed in favor of the large financial institutions – as some form of Too Big (or Too Interconnected) to Fail has proven to hold (with the exception of Lehman Brothers) – it suggests that one should use a measure that separates state support to tell the true underlying strength of each bank. Being aware of this problem, Moody's and Fitch issue bank financial strength ratings along with bank overall credit ratings. Since 1995, a new rating scale, named bank financial strength ratings (BFSRs), has been published by Moody's to grade the financial strength of a bank as a stand-alone concern, thus disregarding any external support. BFSRs are published in addition to overall bank deposit credit ratings (BDCRs), where BDCRs take into account not only the banks' own financial performance but also other institutional factors such as the macroeconomic environment, the quality of supervision, and the implicit or explicit deposit insurance setup[2]. To be sure, Poon *et al.* (1999) already showed that the determinants of BFSRs do differ from those of BDCRs. Using a logit regression, they find that BFSRs may be correctly classified using bank-specific accounting and financial data alike (in decreasing order of importance): loan provision ratios, the dimensions of risk, and profitability. In addition, while sovereign ratings do not figure as a significant determinant, BDCRs help to correctly classify almost 70 per cent of the BFSRs. Later on, Fitch also started publishing its individual ratings (IR), assessing the likelihood that a bank will survive as a going concern without any outside assistance, and support ratings that indicate the likelihood of receiving such assistance in the case of need. Caporale *et al.* (2012) studied the determinants of Fitch's IR and found that, at least prior to the banking crisis, they were strongly related to country effects, bank capitalization, bank size, profitability and non-performing loans. We will take these factors into account in our analysis, in which we focus on Moody's BFSRs and on Fitch's bank individual ratings[3].

Unfortunately, this positive view of the rating data may not be the entire story, as the use of ratings may lead to new problems. As with any subjective data, subjectivity raises fears of measurement error due to idiosyncratic errors potentially introduced by the fact that different individuals rate different companies. The rating firms use algorithms to standardize the ratings; however, they also retain some discretion in assigning ratings, and they do not make the algorithms public. The discretion can be justified by the fact that not all relevant information may be easily captured by standard algorithms and the secrecy by the need to protect the source of business income. Depending on the point of view chosen, this residual subjectivity is both a strength and a cause for concern. Recently, the accuracy of credit ratings has been under severe

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[1] However, agencies may be somewhat slow in revising ratings, which means that in a situation where the economic environment deteriorates rapidly (in a crisis situation), ratings tend to be excessively high. Although the rating agencies aimto incorporate forward-looking indicators into ratings, it may still be that they mostly reflect past development.

[2] Following this intuition, Ferri and Liu (2007) estimate large potential government liabilities behind banking systems.

[3] S & P does not have this measure available.

criticism (e.g., Blöchlinger *et al.*, 2012; Hau *et al.*, 2013). For instance, analyzing bank credit ratings, Hau *et al.* (2013) argue that larger banks obtain systematically better ratings than smaller banks with similar economic fundamentals, thereby exacerbating the "too-big-to-fail" problem. However, this criticism has been targeted to bond issuer ratings rather than BFSRs; furthermore, it is not clear whether this type of measurement error is related in any systematic way to ownership structure.

There may be even stronger concerns that ratings may introduce measurement error that is correlated with ownership structures. Among the factors that raters take into account when evaluating bank strength is the governance structure. There is a danger that the governance structures of stakeholder-value oriented banks are viewed as being inferior simply because they are different from those of profit-maximizing banks. Another case in point is profitability. Stakeholder-value oriented banks may record somewhat lower profitability than profit-maximizing banks, simply because the former do not attempt to maximize profits by all means but have other objectives as well. In this case, stakeholder-value oriented banks may receive a lower score not for efficiency reasons but simply because they have a different objective function.

There is some previous literature related to the ratings of bond issues of cooperative and commercial banks. Fischer and Mahfoudhi (2002) study whether the rating agencies take into account the systematically lower risk of bonds issued by cooperative banks by comparing ratings to the market prices of the bonds. They find that, controlling for a variety of characteristics for bonds and issuing banks, the market charges a lower spread for bonds issued by cooperative banks, suggesting that the rating agencies ignore the lower default risks of the bonds issued by cooperative banks. Flageole and Roy (2005) find that different factors contribute to the ratings of the bonds of cooperative banks than to those of commercial banks, suggesting (somewhat in contradiction to Fischer and Mahfoudhi's findings) that the rating process differs. Again, these analyses relate to bond issues, and their relevance to bank financial strength ratings may be limited.

We are not aware of much literature comparing the relationship between ownership structure and organizational performance using ratings data. The only exception we are aware of is the study by Iannotta *et al.* (2013), which examines differences in ratings between government-owned banks and private commercial banks. These authors find that government-owned banks have systematically lower bank ratings and higher issuer ratings than banks in private ownership, and they interpret this to be a result of the government protection of government-owned banks. However, they do not divide private banks further into cooperative, savings and shareholder banks; neither do they examine how the ratings change over different periods.

In this paper, we are interested in three questions: first, controlling for a number of factors – including various bank-specific economic variables and country controls – have the rating agencies treated stakeholder-value oriented banks differently than profit-maximizing ones since the beginning of the crisis (i.e., comparing the end of 2011 *vis-à-vis* that of 2006)? Second, was there variance in the change across finer breakdowns of stakeholder banks (cooperatives *vs.* savings; tightly federated *vs.* non-federated cooperatives and public *vs.* private savings)? Third, do the different rating agencies treat banks in different ownership classes in a similar way, or do their opinions about bank strength systematically differ?

With this study, we aim to compare the rating performances of banks with different ownership forms by concentrating on the Fitch Bank Individual Rating (Fitch IR) and Moody's Bank Financial Strength (Moody's BFS). Both ratings measure the ability of banks or bank groups to survive without outside support. In their ratings, both agencies take into account issues such as financial fundamentals, branch names, risk positions, bank management and overall operating environment[4].

[4] See Appendix for more information on Fitch Individual Ratings and Moody's Financial Strength Ratings.

3. Data and empirical strategy

We are interested in rating changes during the crisis and how this is related to ownership. The time period we use is from December 2006 to December 2011. We convert the ratings into a numerical scale to use them in a regression analysis. One fundamental difficulty in transforming ratings into a numerical scale is that, strictly speaking, they are ordinal, rather than cardinal, measures of credit risk. A simple linear transformation assuming equivalent differences between the ratings notches all across the distribution may be too simple, as it can be argued that the distances between the notches depend on the location within the ratings scale. Related to bond issuer ratings, it is known that the default probabilities increase exponentially when the bond rating deteriorates (e.g., Fitch, 2012), and the same applies to interest rate spreads (e.g., Langohr and Langohr, 2009). With issuer ratings, one can estimate the distances between the notches using default probabilities or interest rate spreads. Unfortunately, no comparable measure exists for BFS ratings. Nevertheless, we can utilize the known pattern that distances in the bottom of the scale are larger than in the top of the scale by taking the natural logarithm of our numerical rating scale (*lograting*). The dependent variable D *lograting* is defined as $lograting_{t} - lograting_{t-1}$. When using the log scale, differences at the bottom of the scale become more important than equivalent differences between notches at the top of the scale.

We present two types of regressions: a parsimonious regression and an extended regression. In the parsimonious regression, we control for ownership categories, the country of origin, the difference in the (log) ratings of the sovereign debt of the home country of the bank (similarly to the dependent variable, this variable is defined as $log(sovereign\ rating_{t}) - log(sovereign\ rating_{t-1})$, and level of rating (in logs) in the previous period ($lograting_{t-1}$)[5]. In the extended regression, we also control for various bank-level economic variables. The purpose of introducing the latter variables is to control for differences in the banks' business strategies. Following the previous literature (especially Caporale *et al.*, 2012), we include equity per assets, log of assets, loan loss reserves per total loans, profitability (ROA), and deposits per assets. Although many of these variables might be collinear, our primary interest lies not in their coefficients as such, but rather we are interested in how they influence the ownership coefficients[6]. The first type of regression is:

$$\Delta\ lograting_{i;\,t,\,t-1} = \alpha + \beta * ownership_{i} + \chi * country_{i} + \delta * lograting_{i,\,t-1} + \phi * \Delta\ log(sovereign\ rating)_{i;\,t,\,t-1} + \varepsilon_{i,\,t} \quad (1)$$

where the dependent variable is the difference in *lograting* between years t and t-1, a is the intercept, *b* is the vector of coefficients for ownership categories, c is the vector of coefficients for the country dummies, d is the coefficient of the lagged rating, f is the coefficient for the change in sovereign ratings, and e is the error term, which is given by the random effects model[7]. Ownership and country remains constant for all banks throughout the period. Next, we augment this specification so that (2) becomes

$$\Delta\ lograting_{i;\,t,\,t-1} = \alpha + \beta * ownership_{i,} + \chi * country_{i} + \delta * lograting_{i,\,t-1} + \phi * \Delta\ log(sovereign\ rating)_{i;\,t,\,t-1} + \gamma\ controls_{i,\,t-1} + \varepsilon_{i,\,t} \quad (2)$$

where g is the vector of coefficients for bank-level control variables, all lagged by one year.

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[5] For sovereign ratings, we use the Fitch sovereign ratings as an explanatory variable for both Fitch's and Moody's bank rating changes. However, the results are very similar, indicating that the choice of the sovereign ratings variable does not influence results.

[6] The results of Iannotta *et al.* (2007) and Ferri *et al.* (2013) on European banks indicate that the values of these control variables vary substantially depending on ownership structures, so that the failure to control for them might yield biased coefficients.

[7] A fixed effects model is not feasible because there are no changes in our key explanatory variable, ownership.We also estimated the pooled OLS models, and our results are not dependent on the choice of the model.

We run different sets of regressions using either the Fitch or Moody's rating as our dependent variable. Using data from two different sources also allows us to analyze the ratings disagreements. We analyze ratings disagreements in the following way: because the scales used by Fitch and Moody's are not necessarily the same, and in any case, the Moody's rating has more notches, we need first to convert the data into a comparable scale. We convert the data by transforming both numerical scales into new standardized variables that have a mean value of 0 and a standard deviation of 1. Then, we take the difference between the values of this new variable. We construct two new variables, systematic disagreement, which is the difference between the ratings given by Fitch and Moody's (positive values indicating that Fitch gives a better rating than Moody's), and random disagreement, which is the absolute value of said difference.

We use an unbalanced panel for the years 2006-2011. Using the unbalanced panel, we can make sure that we do not exclude observations that disappear during the period due to business failure. Given our interest in focusing especially on distressed banks, it makes sense to use an unbalanced rather than a balanced panel. In total, there are 218 banks in our dataset, of which 152 are in the Fitch dataset, 193 in the Moody's dataset, and 127 in both datasets. The source for all data was Bankscope, from which we derived the ownership data, ratings data, and financial data. The main constraint to the sample size was the ratings data: we collected ratings data for as many banks we could find. However, we included only one observation per banking group (i.e., excluded subsidiaries). We also included only bank groups headquartered in Europe (i.e., no subsidiaries of non-European banks included).

Table 1 gives the distribution of observations according to country and ownership. The ownership categories are similar to those in Ferri *et al*. (2013), which were in turn influenced by Desrochers and Fischer (2005) on cooperative banks and Gardener *et al*. (1997) on savings banks[8].

Cooperative banks have been classified either as cooperative groups (in which case the same rating applies to all banks within the group) or independent cooperatives (mostly building societies or Italian *Banche Popolari*). Savings banks have been regarded as either in private ownership if foundation-owned (mostly in Spain and Norway, and, in Moody's data, also Italy) or public (this category consists mostly of German *Landesbanken*). As is evident from Table 1, in both datasets, there is a slight majority of observations from shareholder banks rather than stakeholder banks; and for stakeholder banks, there are somewhat more savings banks than cooperative banks.

All in all, moving from general to specific, we use three breakdowns: i) a "mission-based" breakdown of shareholder (profit maximizing commercial banks) banks *versus* stakeholder banks (catering not just to their shareholders; the other four categories are grouped); ii) an "ownership-based" categorization of the stakeholder banks differentiating cooperative banks from savings banks; iii) an "organizational/ownership-based" breakdown of the stakeholder banks in which cooperative banks are further subdivided into groups *versus* independent banks (called solo cooperatives in the tables) and savings banks are also split into private *versus* public.

[8] The ownership assignments are based on ready-made classifications from Bankscope, but some of these were corrected and the classifications were developed further. See Ferri *et al*. (2013) for more details.

Table 1. Observation per country and ownership structure

Panel A :Fitch Data						
Country name	***Cooperative groups***	***Solo cooperatives***	***Private savings banks***	***Government-owned savings banks***	***Shareholder banks***	***Total***
Austria	1	0	0	1	1	***3***
Belgium	0	0	0	0	4	***4***
Cyprus	0	0	0	0	3	***3***
Denmark	0	0	0	0	2	***2***
Finland	1	0	0	0	1	***2***
France	2	0	0	0	6	***8***
Germany	1	0	0	9	5	***15***
Greece	0	0	0	0	6	***6***
Iceland	0	0	0	0	0	***0***
Ireland	0	2	0	0	5	***7***
Italy	0	10	0	0	10	***20***
Luxembourg	0	0	0	0	0	***0***
Netherlands	1	0	0	0	7	***8***
Norway	0	0	4	0	2	***6***
Portugal	0	0	0	2	4	***6***
Spain	1	3	20	0	9	***33***
Sweden	0	0	0	0	4	***4***
Switzerland	0	0	0	1	3	***4***
United Kingdom	0	10	0	0	11	***21***
Total	***7***	***25***	***24***	***13***	***83***	***152***
Panel B: Moody's Data						
Austria	2	0	0	1	2	***5***
Belgium	0	0	0	0	4	***4***
Cyprus	0	0	0	0	3	***3***
Denmark	0	1	0	0	9	***10***
Finland	1	0	0	0	2	***3***
France	4	0	0	0	5	***9***
Germany	2	1	0	12	7	***22***
Greece	0	0	0	0	7	***7***
Iceland	0	0	0	0	2	***2***
Ireland	0	2	0	0	6	***8***
Italy	0	8	5	0	17	***30***
Luxembourg	0	0	0	1	2	***3***
Netherlands	1	0	0	0	5	***6***
Norway	0	0	5	0	3	***8***
Portugal	0	0	0	2	4	***6***
Spain	1	4	14	0	11	***30***
Sweden	0	0	0	0	5	***5***
Switzerland	1	0	0	3	4	***8***
United Kingdom	0	11	0	0	13	***24***
Total	***12***	***27***	***24***	***19***	***111***	***193***

In Table 2, we show ratings and the numerical counterparts we assigned to them. Fitch IR's numeric values span from 1 to 10 (10 being the best and 1 the worst), while Moody's FS' numeric values go from 1 to 13 (again 13 being the best and 1 the worst)[9]. We also show the equivalents in log scale.

[9] Fitch IR ceased to exist after December 2011, when Fitch changed bank Individual Ratings to a different scale (with 19 points) and renamed it Viability Ratings. However, we use only data up to December 2011, and therefore our estimations are not affected by this data change.

Table 2. Ratings and their numerical equivalents

Log equivalent	*Linear equivalent*	*Fitch Individual*	*Explanation*	*Moody's Financial Strength*	*Linear equivalent*	*Log equivalent*
2.30	10	A	Very Strong	A	13	2.57
2.20	9	A/B		A-	12	2.48
2.08	8	B	Strong	B+	11	2.40
1.95	7	B/C		B	10	2.30
				B-	9	2.20
1.79	6	C	Adequate	C+	8	2.08
1.61	5	C/D		C	7	1.95
				C-	6	1.79
1.39	4	D	Problematic	D+	5	1.61
1.10	3	D/E		D	4	1.39
				D-	3	1.10
0.69	2	E	Serious problems	E+	2	0.69
0	1	F	or default	E	1	0

4. Descriptive statistics

How have bank ratings evolved since the onset of the crisis? A slightly different story is told depending on which of the two rating agencies we examine. In Figure 1, we present the development of the average (linear) numerical ratings using data from Fitch. The figure presents the average numerical ratings for the end of the years 2006-2011 for shareholder banks, cooperative banks, savings banks, and stakeholder banks. It can be observed that shareholder banks start with somewhat higher average ratings than stakeholder banks, but after 2009, their ratings deteriorate faster, and by the end of 2011, they are at a clearly lower level than stakeholder banks.

Figure 1. Shareholder banks *vs*. stakeholder, cooperative and savings banks, Fitch

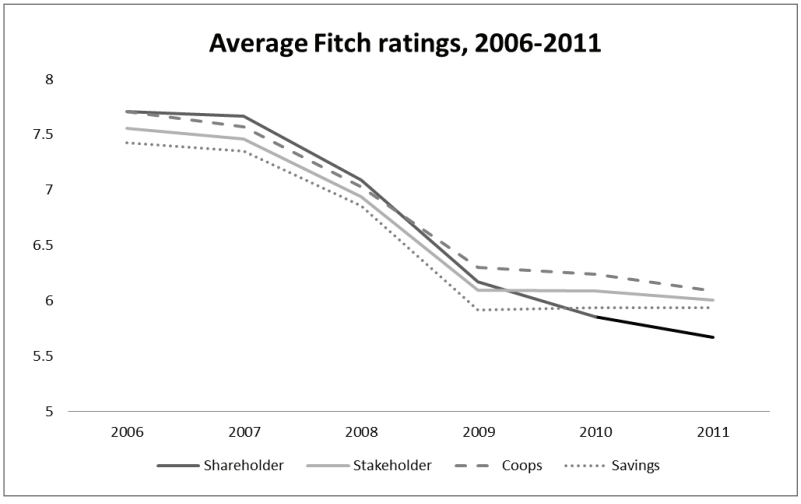
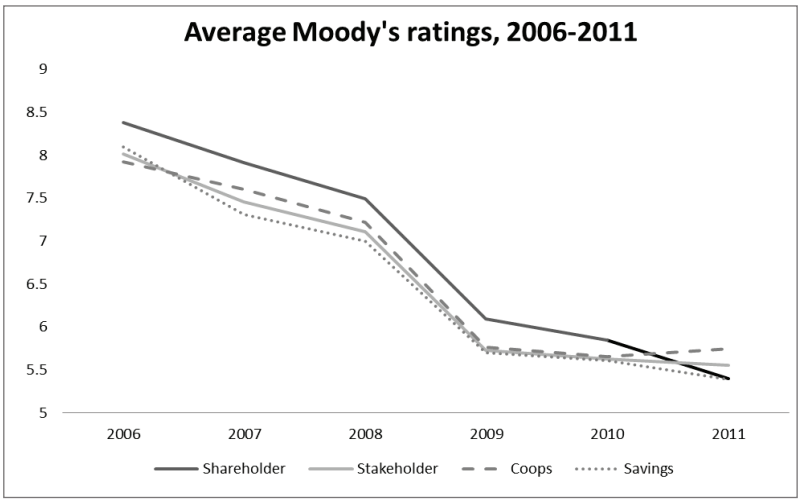


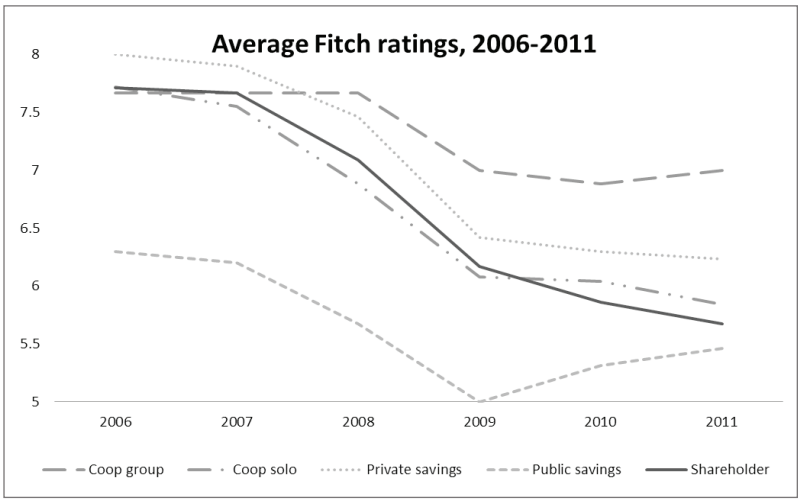
Figure 2 tells the same story for Moody's. In the early period, all types of banks are hit roughly equally and shareholder banks have on average higher ratings than stakeholder banks, but in 2011, the situation is reversed.

Figure 2. Shareholder banks vs. stakeholder, cooperative and savings banks, Moody's



In Figures 3 and 4, we utilize the more disaggregated classes taken from Ferri *et al*. (2013) and divide cooperative banks into cooperative groups and independent cooperatives, and savings banks into private and public savings banks. Starting from Figure 3, which displays the Fitch ratings, we note that there is initially a large difference between the ratings of different types of savings banks, private savings banks actually having the best ratings in 2006-2007 and public savings banks, the worst. In contrast, cooperative groups and independent cooperative banks have fairly similar ratings from Fitch in 2006-2007, but this changes in 2008, when the ratings of independent cooperative banks deteriorate substantially. In 2009, cooperative groups are clearly downgraded less *vis-à-vis* other types of banks. Moreover, public savings banks, while having deteriorating ratings between 2007 and 2009, start to actually improve their ratings after 2009, thus reducing the gap between this and other categories.

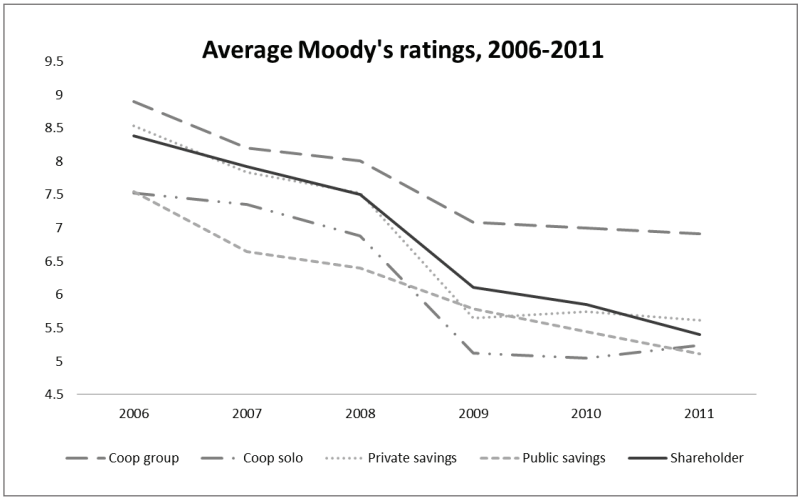
Figure 3. The performance of shareholder banks and various types of stakeholder banks, Fitch



When looking at Moody's ratings (Figure 4), it is notable that cooperative groups start clearly above other groups, and, though their ratings generally deteriorate during the period, they remain clearly above the other groups. Private savings banks and independent cooperatives experience a large decline in 2009, after which point their ratings stabilize. The ratings of shareholder banks and public savings banks decline

consistently throughout the period.

Figure 4. The performance of shareholder banks and various types of stakeholder banks, Moody's



An alternative view of the same process can be obtained by looking at downgrades and upgrades throughout the process; Table 3 presents these for the Fitch and Moody's data. Initially, Fitch and Moody's took rather different views on the developing subprime crisis: Moody's downgraded 47% of banks in the sample during 2007, while Fitch did so only for 5% of the banks. The situation reversed somewhat in 2008, when Fitch downgraded 34% of the banks and Moody's only 23%. 2009 was the worst year in terms of ratings development: Fitch downgraded 51% of the banks, and Moody's downgraded 63%. Only one upgrade (by Fitch) took place during the years 2008-2009. In 2010, things no longer looked as bad: Fitch downgraded 15% of the banks and upgraded 7%, whereas for Moody's, the respective figures were 15% and 3%. In 2011, Fitch downgraded 17% of the banks and upgraded 10%; Moody's, more pessimistically, downgraded 25% of the banks and upgraded only 5%. During the entire period, 68% of the banks were downgraded by Fitch, and only 2% were upgraded. For Moody's, the figures are much bleaker: 87% were downgraded, and 3% were upgraded.

Table 3. The proportion of downgrades and upgrades among banks, by ownership: percentage of observations

	2007		***2008***		***2009***		***2010***		***2011***		***2006-2011***	
	Down	***Up***	***Down***	***Up***	***Down***	***Up***	***Down***	***Up***	***Down***	***Up***	***Down***	***Up***
Panel A: Fitch Data												
All	4.6	3.9	33.8	0	50.7	0.7	15.4	7.4	17.2	9.7	68.4	2.3
Shareholders	2.6	5.3	28.8	0	48.2	1.2	22.5	8.8	21.8	11.5	69.3	1.3
Stakeholders	7.4	1.9	40	0	53.7	0	7.3	5.8	11.9	7.5	67.2	3.5
Cooperatives	4.1	0	37.9	0	35.5	0	9.1	3	15.6	0	60	4
Savings	10	3.3	41.7	0	69.4	0	5.6	8.3	8.6	14.3	72.7	3
Coop group	0	0	0	0	0	0	25	12.5	14.3	0	33.3	0
Coop solo	5.6	0	47.8	0	44	0	4	0	16	0	68.4	5.3
Private savings	10	5	41.7	0	75	0	8.7	0	4.6	0	80.1	0
Public savings	10	0	41.7	0	58.3	0	0	23.1	15.4	38.5	58.3	8.3
Panel B: Moody's Data												
All	47.1	11.5	23.1	0	63	0	14.7	2.8	24.5	5.4	86.7	3.3
Shareholders	46.3	15.8	21.7	0	65.7	0	17.7	2.9	28.4	2.9	87.2	5.3
Stakeholders	48.4	4.8	25	0	59.2	0	10.7	2.7	18.5	9.2	85.7	0
Cooperatives	28.1	3.1	29.7	0	56.8	0	16.67	0	15.2	12.1	82.1	0
Savings	70	6.7	20.5	0	61.5	0	5.1	5.1	21.9	6.25	89.3	0
Coop group	55.6	0	27.3	0	40	0	10	0	30	0	77.8	0
Coop solo	17.4	4.4	30.8	0	63	0	19.2	0	8.7	17.4	84.2	0
Private savings	76.5	5.9	23.8	0	85.7	0	0	9.5	7.1	7.1	83.3	0
Public savings	61.5	7.7	16.7	0	33.3	0	11.1	0	33.3	5.6	93.8	0

Examining the rating changes by ownership, we note that in the earliest stage of the crisis (2007-2009) both agencies downgraded stakeholder and shareholder banks in roughly equal measure. After 2009, clearly more shareholder banks than stakeholder banks were downgraded. Another observation that is visible with both agencies is the massive downgrading of private savings banks in the year 2009.

Table 4 presents the average changes by ownership category by both agencies in linear and logarithmic scale. The results for Fitch indicate that the ratings for stakeholder banks have deteriorated less on average, and the difference is statistically significant. Moreover, in the linear scale, differences are statistically significant for cooperative groups and public savings banks. In log scale, there is a difference at the 5% level of statistical significance for stakeholder banks, for cooperatives in general, and for cooperative groups. In the Moody's data, there are no statistically significant differences, giving a first indication that there may be a difference in how the two agencies treat shareholder and stakeholder banks.

In any case, the differences found with the Fitch data may also be attributed to various factors. Stakeholder banks had initially lower ratings and thus had less room to deteriorate. The differences may also reflect some strategic differences between the different types of banks. Perhaps most importantly, the difference may reflect the fact that those countries where stakeholder banks (especially cooperatives) are strong were less hit by the crisis (Leogrande, 2013). While the last point may suggest that stakeholder banks create a positive externality for other banks in the country, we control for this effect by including country dummies as well as initial ratings and bank business strategies on the basis of bank financial variables.

Table 4. Mean rating changes during the entire period

	Fitch		***Moody's***	
	Annual change in notches	***Annual change in log scale***	***Annual change in notches***	***Annual change in log scale***
All	-0.36	-0.07	-0.55	-0.09
	(1.03)	(0.26)	(1.10)	(0.24)
Shareholder	-0.42	-0.09	-0.58	-0.10
	(1.22)	(0.32)	(1.15)	(0.26)
Stakeholder	-0.28*	-0.05**	-0.50	-0.08
	(0.72)	(0.17)	(1.02)	(0.2)
Cooperative	-0.28	-0.05*	-0.48	-0.08
	(0.7)	(0.15)	(1.01)	(0.22)
Savings	-0.28	-0.05	-0.53	-0.08
	(0.74)	(0.19)	(1.02)	(0.2)
Coop group	-0.06*	-0.01*	-0.44	-0.07
	(0.35)	(0.06)	(0.78)	(0.17)
Coop solo	-0.34	-0.06	-0.49	-0.09
	(0.76)	(0.17)	(1.09)	(0.24)
Private savings	-0.35	-0.06	-0.63	-0.09
	(0.7)	(0.19)	(1.09)	(0.20)
Public savings	-0.17*	-0.03	-0.42	-0.08
	(0.78)	(0.19)	(0.93)	(0.19)

Note: the asterisks indicate (unconditional) statistically different means with shareholder banks. Significance levels: *** 10%; ** 5%; * 1%

5. Regression analysis of rating changes

We begin the analysis by presenting the results from regressions that use Fitch data and logarithmic changes in ratings as their dependent variable. The models (I)-(III) in Table 5 present results that include ownership and country dummies, lagged level of (log) ratings, and the difference in the (log of) sovereign ratings. Models (IV)-(VI) additionally include the bank-specific control variables. All reported standard errors are heteroskedasticity and autocorrelation robust. The R-squares vary between 0.16 (models I-III) to 0.26 (models IV-VI).

For the control variables, lagged ratings are always statistically significant (at a level of at least 5%) and negative, indicating that the higher the rating initially, the larger the downgrade. This result was rather expected given that the banks with higher ratings have also more room to deteriorate. The coefficient of change in the sovereign rating is positive and statistically significant at the 1% level (when additional bank-specific variables have not been added), which means that the bank ratings and sovereign ratings for the country where the bank is located move into the same direction. This result may be surprising in light of Poon *et al.*'s (1999) results, which indicate that sovereign ratings do not influence bank ratings, but it may be understood in the context of a crisis situation in which the macroeconomic environment that the bank operates within becomes a crucial determinant of bank viability.

The evidence presented in column 3 suggests that cooperative banking groups have weathered the crisis better than other types of banks, as the coefficient it receives is positive and statistically significant (at the 5% level). The coefficient for independent cooperative banks is also positive, but it is not statistically significant. For saving banks, there is no evidence that they would have performed better than shareholder banks during the crisis.

Table 5. Random effects regression results for Fitch data, ratings in log scale: coefficients and standard errors

	Difference in log ratings (Fitch)					
Model	***I***	***II***	***III***	***IV***	***V***	***VI***
Stakeholder	0.0127			0.0316		
	(0.020)			(0.024)		
Cooperative		0.0347			0.0543*	
		(0.022)			(0.028)	
Savings		-0.0162			0.00787	
		(0.027)			(0.029)	
Coop group			0.0408**			0.0846***
			(0.019)			(0.025)
Solo coop			0.0331			0.0459
			(0.029)			(0.035)
Private savings			-0.0116			0.0208
			(0.040)			(0.041)
Public savings			-0.0234			-0.0130
			(0.023)			(0.033)
Change in sovereign rating $_{t-1}$	0.165**	0.166**	0.166**	0.0766	0.0762	0.0775
	(0.076)	(0.076)	(0.077)	(0.084)	(0.084)	(0.084)
Log (rating $_{t-1}$)	-0.149**	-0.154**	-0.155**	-0.309***	-0.318***	-0.323***
	(0.067)	(0.066)	(0.067)	(0.052)	(0.051)	(0.051)
(equity/assets) $_{t-1}$				-0.353	-0.331	-0.312
				(0.434)	(0.440)	(0.438)
log(assets) $_{t-1}$				0.0115*	0.0125**	0.0128**
				(0.006)	(0.006)	(0.006)
(loanloss provisions/loans) $_{t-1}$				-2.594	-2.371	-2.543
				(2.603)	(2.710)	(2.728)
$ROAA_{t-1}$				0.143***	0.146***	0.145***
				(0.028)	(0.029)	(0.029)
(deposits/assets) $_{t-1}$				0.0413	0.0260	0.0321
				(0.100)	(0.096)	(0.094)
Country and year dummies	YES	YES	YES	YES	YES	YES
# of observations	711	711	711	590	590	590
R^2	0.163	0.166	0.166	0.260	0.262	0.263
# of banks	152	152	152	146	146	146

Note: 1) Standard errors are heteroskedasticity and autocorrelation robust; 2) Significance levels: ***<1%; **<5%; *<10%

Models IV – VI introduce the bank-specific control variables, which turn out to be significant as a group. Banks that have better profitability and that are larger were downgraded less during the crisis[10]. Instead, loan loss provisions, capitalization and deposits per assets are not related to ratings changes in any statistically significant way. Of the ownership dummies, an important difference compared to the previous model is that now the dummy for cooperatives in general is positive and significant at a 10% level. The dummy for cooperative groups remains significant, now at a 1% level. Inclusion of the bank-specific controls has increased the cooperative group dummy's coefficient twofold compared to column 3.

Table 6 reports the results for Moody's. The results concerning the lagged rating (negative) and the change in sovereign ratings (positive) are consistent with the Fitch results. For the other control variables, size is again a statistically significant factor slowing the downgrade, as with Fitch. Unlike with Fitch, profitability loses its significance, whereas now loan loss provisions per total loans is negatively and deposits per assets is positively related to ratings change. However, the ownership dummies are never statistically significant.

[10] The latter result offers some indication that the favorable treatment of large banks in assigning ratings (identified by Hau *et al.* 2013) may also apply to BFSRs.

Table 6. Random effects regressions results for Moody's data ratings in log scale: coefficients and standard errors

	Difference in log ratings (Moody's)					
Model	***I***	***II***	***III***	***IV***	***V***	***VI***
Stakeholder	-0.00896			-0.0179		
	(0.016)			(0.016)		
Cooperative		-0.00308			-0.0178	
		(0.020)			(0.020)	
Savings		-0.0161			-0.0159	
		(0.018)			(0.021)	
Coop group			0.00116			0.00869
			(0.029)			(0.034)
Solo coop			-0.00496			-0.0312
			(0.026)			(0.023)
Private savings			-0.0180			-0.0261
			(0.024)			(0.030)
Public savings			-0.0133			-0.00624
			(0.025)			(0.028)
Change in sovereign rating $_{t-1}$	1.046***	1.047***	1.047***	1.097***	1.097***	1.098***
	(0.197)	(0.197)	(0.197)	(0.245)	(0.245)	(0.246)
Log (rating $_{t-1}$)	-0.145***	-0.145***	-0.145***	-0.240***	-0.240***	-0.204***
	(0.035)	(0.035)	(0.035)	(0.054)	(0.055)	(0.054)
(equity/assets) $_{t-1}$				0.543	0.543	0.591
				(0.400)	(0.400)	(0.392)
log(assets) $_{t-1}$				0.0118*	0.0118*	0.0109*
				(0.005)	(0.006)	(0.006)
(loanloss provisions/loans) $_{t-1}$				-5.757***	-5.753***	-5.853***
				(1.789)	(1.797)	(1.799)
$ROAA_{t-1}$				0.0240	0.0240	0.0234
				(0.019)	(0.019)	(0.019)
(deposits/assets) $_{t-1}$				0.177***	0.177***	0.177***
				(0.065)	(0.066)	(0.068)
Country and year dummies	YES	YES	YES	YES	YES	YES
# of observations	861	861	861	717	717	717
R^2	0.324	0.324	0.324	0.377	0.377	0.377
# of banks	193	193	193	183	183	183

Note: 1) Standard errors are heteroskedasticity and autocorrelation robust; 2) Significance levels: ***<1%; **<5%; *<10%

For a robustness check, we performed the analysis using the OLS estimator and also use the linear scale for ratings instead of the logarithmic one. In all cases, the results remained similar.

In sum, somewhat mixed findings emerge from the analysis. The findings from Fitch data indicate that ownership structure matters: cooperative banking groups experienced smaller downgrades than shareholder banks, and there is some evidence that this holds also for cooperatives more generally. From Moody's data, even though the results are not in conflict with respect to the four distinct ownership groups, they are much more muted, and ownership dummies never emerge as statistically significant. What leads to this discrepancy?

There are two distinct possibilities: either there are significant differences in the samples, or the agencies in fact do rate the banks differently. The first of these possibilities is easily tested: we can repeat the regression by using only the observations that are common to both datasets. Table 7 presents some of these results for this limited dataset providing evidence that can be compared to Models I – III in Tables 5 and 6[11]. The results for the Fitch dataset remain very similar to the previous results, although the result for cooperative groups is now even stronger (statistically significant at a 1% level). An interesting finding relates to Moody's dataset, where (in column II) the coefficient for savings banks as a group is negative and now statistically significant (at a 5% level), indicating that savings banks have experienced more downgrades than shareholder banks. However, the dummies for cooperatives in general, and cooperative groups in particular, continue to be

[11] We omit from the presentation the results including economic variables, but the results remain similar if they are included.

insignificant. These results suggest that the differences are, by and large, not driven by differences in the two samples.

Table 7. Changes in ratings, log scale: Fitch and Moody's compared

	Fitch Difference in ratings			***Moody's Difference in ratings***		
	(I)	***(II)***	***(III)***	***(I)***	***(II)***	***(III)***
Stakeholder	0.0187			-0.0215		
	(0.023)			(0.021)		
Cooperative		0.0353			-0.0000531	
		(0.025)			(0.026)	
Savings		-0.00282			-0.0491**	
		(0.031)			(0.025)	
Coop group			0.0683***			0.0322
			(0.022)			(0.029)
Solo coop			0.0270			-0.0120
			(0.033)			(0.033)
Private savings			0.0326			-0.0516
			(0.050)			(0.035)
Public savings			-0.0410			-0.0432
			(0.030)			(0.033)
Change in sovereign rating $_{t-1}$	0.229***	0.230***	0.232***	0.935***	0.936***	0.937***
	(0.079)	(0.079)	(0.079)	(0.226)	(0.226)	(0.226)
Log (rating $_{t-1}$)	-0.241**	-0.246***	-0.253***	-0.148***	-0.148***	-0.150***
	(0.094)	(0.094)	(0.095)	(0.040)	(0.039)	(0.040)
Country and year dummies	YES	YES	YES	YES	YES	YES
# of observations	566	566	566	566	566	566
R^2	0.208	0.210	0.213	0.349	0.352	0.352
# of banks	127	127	127	127	127	127

Note: 1) Standard errors are heteroskedasticity and autocorrelation robust; 2) Significance levels: ***<1%; **<5%; *<10%

6. Analysis of rating disagreements

Because the differences in the two samples are not sufficient to explain the divergent results, it is instructive to look at rating disagreements. As explained above, we make this examination by creating new standardized variables out of the end-of-year ratings for those observations for which we have both a Fitch Individual Rating and a Moody's Financial Strength Rating. We have a dataset consisting of 586 observations. Both Moody's and Fitch's ratings are transformed into a standardized scale having mean 0 and standard deviation 1. We define the systematic disagreement as a difference between the standardized value of Fitch's rating and the standardized value of Moody's rating. A positive value for this difference means that Fitch has given the bank a higher standardized rating than Moody's, whereas a negative value means the opposite. We also calculate the random rater disagreement, defined as the absolute value of the rating disagreement. This measure is similar to the measures of business opacity developed by Morgan (2002)[12].

[12] In the work by Morgan (2002), the measure of opacity was drawn using split (bond) ratings. When using bank financial strength ratings where the scales are different, the concept of split ratings does not apply, but we believe our method is a close equivalent.

Table 8. Mean values of systematic and absolute rater disagreement, by ownership

Ownership	*Systematic disagreement*	*Absolute disagreement*	*Number of observations*
Shareholder	-0.08 (0.66)	0.50 (0.44)	347
Stakeholder	0.23 (0.62)	0.50 (0.43)	239
Cooperative	0.32 (0.67)	0.56 (0.48)	119
Savings	0.15 (0.56)	0.44 (0.37)	120
Cooperative Group	0.08 (0.95)	0.72 (0.62)	26
Solo Cooperative	0.38 (0.55)	0.52 (0.43)	93
Private Savings	0.37 (0.53)	0.49 (0.43)	61
Public Savings	-0.07 (0.49)	0.39 (0.30)	59

The summary statistics related to systematic and absolute rating disagreements are displayed in Table 8. There appears to be a slight bias in Fitch's ratings in favor of stakeholder banks, which is most pronounced for independent cooperative banks and private savings banks. In contrast, in absolute disagreements, there is no difference between shareholder and stakeholder banks. Of all ownership groups, only public savings banks appear to be somewhat different by having lower values of absolute disagreements (and no systematic disagreement at all).

Table 9 reports the regressions on rater disagreements, where in addition to ownership, country and year effects are controlled for. The reported standard errors are heteroskedasticity and autocorrelation robust. The reported coefficients tend to confirm the findings from the summary statistics. There is evidence that stakeholder banks receive higher ratings from Fitch than from Moody's (Column I); this effect is visible especially in cooperative banks (Column II), and in the more disaggregated ratings, it is more pronounced for independent cooperative banks and private savings banks (Column III). There are few differences in absolute disagreements: the significant ownership dummy is that of savings banks (Column V), and that of public savings banks in particular (Column VI); the negative sign indicates that there is more rater agreement regarding public savings banks than other types of banks. In other words, there is approximately the same degree of overall disagreement regarding stakeholder banks than regarding shareholder banks. However, whereas in shareholder banks, the disagreement between the rating agencies tends to be more random, among stakeholder banks, Fitch appears to give higher ratings to at least certain types of stakeholder banks than it gives to shareholder banks. The underlying source of this methodological difference is not known in the absence of more details regarding rating methodologies.

Table 9. Systematic and absolute rater disagreement and ownership: regression analysis

	Systematic disagreement			***Absolute disagreement***		
	(I)	***(II)***	***(III)***	***(I)***	***(II)***	***(III)***
Stakeholder	0.285***			-0.00688		
	(0.088)			(0.055)		
Cooperative		0.372***			0.109	
		(0.141)			(0.085)	
Savings		0.170			-0.161*	
		(0.143)			(0.090)	
Coop group			0.285			0.256
			(0.425)			(0.206)
Solo coop			0.417***			0.0715
			(0.109)			(0.076)
Private savings			0.352**			0.0115
			(0.177)			(0.125)
Public savings			-0.0467			-0.339***
			(0.231)			(0.113)
Country and year dummies	YES	YES	YES	YES	YES	YES
# of observations	586	586	586	586	586	586
R^2	0.288	0.294	0.304	0.138	0.164	0.187
# of banks	129	129	129	129	129	129

Note: 1) Standard errors are heteroskedasticity and autocorrelation robust; 2) Significance levels: ***<1%; **<5%; *<10%

7. Conclusions

In this study, we addressed the relative performance of European banks during the recent crisis by examining bank individual rating changes from two of the most prominent credit rating agencies: Moody's and Fitch. We divided the banks into different classes according to their ownership structure, making a distinction between shareholder and stakeholder banks, and dividing stakeholder banks further into cooperative and savings banks. Finally, we divide cooperative banks into groups and independent cooperatives, and savings banks into private and public.

It turns out that there are important differences across ownership categories both in the levels of ratings when the crisis started and in the subsequent ratings changes between 2006 and 2011. For instance, before the crisis, shareholder banks had, on average, higher ratings than stakeholder banks, and public savings banks had much lower ratings than other banks. During the crisis, the ratings of shareholder banks deteriorated more than those of stakeholder banks, especially after 2009. Cooperative groups, in particular, appear more resilient to the crisis.

When analyzing the changes in a regression framework, where we control for changes in sovereign ratings, lagged rating, country effects and bank-specific control variables, we find that when using ratings data from Fitch, the ratings of cooperative groups deteriorate less than those of shareholder banks. However, when using ratings data from Moody's, the differences across ownership categories, while mostly similar to those deriving from the Fitch data, are not statistically significant. This result prompted us to analyze the rater disagreements. Our results indicate that there are systematic rating disagreements between the two agencies, Fitch giving more positive ratings to independent cooperatives and private savings banks than Moody's. There is less evidence for random rating disagreements between the agencies, although there is evidence that there are fewer disagreements on the financial strength of public savings banks compared to other banks.

The study has implications for the debate between the merits of different ownership structures during an economic crisis. Overall, the results support the interpretation that cooperative banks have been more

resilient during the financial crisis than shareholder banks. This result is consistent with the claims that the cooperative ownership structure induces less risk taking than a profit-maximizing structure.

Our analysis also has interesting implications in terms of rating disagreements. It appears that two major rating agencies, Fitch and Moody's, apply somewhat different rating methodologies to stakeholder banks. Further research on the specific mechanisms behind these differences is recommended.

Appendix

Fitch Ratings: Bank Individual Ratings

Fitch IR attempts to assess how a bank would be viewed if it were entirely independent and could not rely on external support. Ratings are designed to assess the bank's exposure to, appetite for, and management of risk, and thus represent the agency's view on the likelihood that the bank would run into significant financial difficulties such that it would require support.

A: A very strong bank – Characteristics may include outstanding profitability and balance sheet integrity, franchise, management, operating environment or prospects.

B: A strong bank – There are no major concerns regarding the bank. Characteristics may include strong profitability and balance sheet integrity, franchise, management, operating environment or prospects.

C: An adequate bank that, however, possesses one or more troublesome aspects – there may be some concerns regarding its profitability and balance sheet integrity, franchise, management, operating environment or prospects.

D: A bank that has weaknesses of internal and/or external origin – there are concerns regarding its profitability and balance sheet integrity, franchise, management, operating environment or prospects. Banks in emerging markets are necessarily faced with a greater number of potential deficiencies of external origin.

E: A bank with very serious problems, which either require or are likely to require external support.

F: A bank that has either defaulted or, in Fitch Ratings' opinion, would have defaulted if it had not received external support. Examples of such support include state or local government support, (deposit) insurance funds, acquisition by some other corporate entity or an injection of new funds from its shareholders or equivalent.

Moody's Investor Services: Bank Financial Strength Ratings

Moody's FS ratings represent Moody's opinion of a bank's intrinsic safety and soundness. Ratings do not address either the probability of timely payment (i.e., default risk) or the loss that an investor may suffer in the event of a missed payment. Instead, FS is a measure of the likelihood that a bank will require assistance from third parties such as its owners, its industry group, or official institutions, to avoid default. FS ratings do not take into account the probability that the bank will receive such external support nor do they address the external risk that sovereign actions may interfere with a bank's ability to honor its domestic or foreign currency obligations. Factors considered in the assignment of FS ratings include bank-specific elements such as financial fundamentals, franchise value, and business and asset diversification as well as risk factors in the bank's operating environment, such as the strength and prospective performance of the economy, the structure and relative fragility of the financial system, and the quality of banking regulation and supervision.

Moody's FS ratings range from A to E, with A for banks with the greatest intrinsic financial strength and E for banks with the least intrinsic financial strength. A "+" modifier may be appended to ratings below a category and a "-" modifier may be appended to ratings above a category to identify those banks

that are placed higher or lower in a rating category[13].

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