

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

by

Giovanni Ferri (LUMSA, Rome), Panu Kalmi (University of Vaasa), Eeva Kerola (Aalto School of Economics)

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## Abstract

The Great Crisis started in 2007 deeply affected banks throughout Europe. Using the assessment of the two global rating agencies (Fitch and Moody's) publishing ratings on the financial strength of individual banks, we study whether the crisis hit the European banks differently across their mission/ownership/organizational structure. In particular, moving from general to specific, we consider three breakdowns of the banks: i) a "mission-based" breakdown of shareholder (profit maximizing) banks vs. stakeholder banks (catering not only for their shareholders); 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 where cooperative banks are further subdivided into tightly federated vs. non-federated and savings banks are also split into private vs. public.

We also subdivide the entire crisis period 2007-2011 into three separate phases: 1) the 2007-2008 phase, mostly limited to the financial sector; 2) the 2009 stint, when the action moved to the real sector triggering recession; 3) the 2010-2011 phase, dominated again by a financial shock, this time the European sovereign debt crisis. Our "mission-based" breakdown suggests us that shareholder banks – with their vocation to financial investment – be more vulnerable to financial shocks while stakeholder banks – inclined toward nonfinancial lending – be more exposed to real shocks. Then, we would expect that the stakeholder banks were less severely hit than the shareholder banks at least in phase 1 and 3, whereas we are unsure about holding that expectation for phase 2. We have instead no strong a priori on how the impact of the different phases of the crisis might have impinged on the two additional "ownership-based" and "organizational/ownership-based" breakdowns of the stakeholder banks.

Employing country-level and balance-sheet controls, the results of our econometric estimates lend some support to our hypothesis. Namely, focusing on the bank rating changes across the three phases of the crisis, we detect a statistically significant (relative) improvement for the stakeholder banks vs. the shareholder ones on Fitch data in both the 2<sup>nd</sup> and 3<sup>rd</sup> phase, while the latter significantly outperform the former for Moody's but only in the 1<sup>st</sup> phase and more weakly. Breaking down the stakeholder banks into cooperative vs. savings reveals that Fitch's stakeholder banks' improvement depends on cooperative banks only while stakeholder banks' underperformance for Moody's regards the savings banks and not the cooperative banks. Finally, the most granular breakdown suggests that Fitch (relatively) improved both the tightly federated and the non-federated cooperative banks (2<sup>nd</sup> and 3<sup>rd</sup> phase) and slightly so the public savings banks (2<sup>nd</sup> phase). In turn, Moody's first downgraded more severely (1<sup>st</sup> phase) and then upgraded relatively more (2<sup>nd</sup> phase) the public savings banks.

*JEL Classification Codes:* G2, G21, G3, G32, G34, P13.

*Keywords:* European banking; shareholder banks; cooperative banks; savings banks; performance; organizational structure; credit rating agencies.

## 1. Introduction

Stakeholder-owned banks (cooperative and savings banks) are prevalent in European banking markets. In many countries, they have a larger market share than profit-maximizing banks. Their ownership structure that prevents takeovers has often been viewed as an impediment to economic efficiency. The financial and economic crisis that started in 2007 has led to a re-evaluation of many earlier beliefs on the banking sector. 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-owned and profit-maximizing banks.

The novel question we tackle here is looking at the rating differences across different ownership structures, 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 for certain types of measurement error than standard financial statements, and it is more readily available as the crisis unfolds. However, there are certain concerns (rater subjectivity, potential bias towards profit-maximization objective) that we discuss in the paper as well.

In addition, in this paper we build upon our own previous work (Ferri, Kalmi & Kerola 2010; 2012) and to that of others (Desrochers, Fischer 2005) in making clear differentiation between different types of stakeholder-owned banks. We divide them into tightly federated co-operative banks, non-federated cooperative banks, private savings banks, and public savings banks.

As to the differential impact of the crisis on the various bank categories, we subdivide the crisis into three separate phases. The first one, 2007-2008, was a fully-fledged systemic crisis mostly limited to the financial sector with its epicenter in the US. In the second phase, 2009, the financial crisis escalated into recession and the action moved from the financial to the real sector. Finally, the third phase, 2010-2011, was dominated by the homegrown European sovereign debt crisis, something originating in the financial domain, though rapidly turning into recession in the affected countries. In the first phase, the public opinions across the continent saw their governments offer energetic support to avoid the bankruptcy of many banks. Particularly hit were the larger-sized banking groups, typically shareholder banks and more specialized in financial market business. Thus, on the surface, it looks like the stakeholder banks (cooperatives and savings banks) might have been less severely hit. In the second phase, instead, as the crisis hit the real sector, one could expect that this time the stakeholder banks – that are more ingrained with their lending activity to households and firms – should have been suffering more. In the third phase, the financial nature of the crisis probably prevailed – at least as we limit our assessment to the end of 2011 when the recession had not yet become entrenched in most of the EU sovereign debt crisis countries – and we might expect the stakeholder banks to have suffered less than their shareholder homologues. In all, we could expect that the stakeholder banks were less severely hit than the shareholder banks at least in phase 1 and 3, whereas we are unsure about holding that expectation for phase 2.

The results of our econometric estimates lend some support to the proposed view, particularly as regards the rating changes enacted by Fitch that show a statistically significant (relative) improvement for the stakeholder banks vs. the shareholder ones on Fitch data in the both the second and third phases, whereas the latter were significantly outperforming the former according to Moody's data but only in the first phase. Breaking down the stakeholder banks into cooperative banks and savings banks reveals that Fitch's improvement depends on cooperative banks only while these banks' underperformance according to Moody's regards the savings banks and not the cooperative banks. Finally, the most granular breakdown suggests that Fitch (relatively) upgraded both the tightly federated (in the 2<sup>nd</sup> and 3<sup>rd</sup> phases) and the non-federated cooperative banks (only in the 3<sup>rd</sup> phase) and it also upgraded the public savings banks in the 2<sup>nd</sup> phase. In turn, Moody's first downgraded (1<sup>st</sup> phase) and then upgraded (2<sup>nd</sup> phase) the public savings banks.

The rest of the paper is structured as follows. In the next section we summarize the debate on the relative performance of shareholder vs. stakeholder banks – as well as the four subdivisions of the latter banks – and discuss how we can use the assessments made explicit by the credit rating agencies to evaluate the relative performance of these bank categories. Section 3 presents the data on the relevant rating changes over the entire period (2006-2011). Next, in section 4, we report some descriptive statistics and break them down according to the three different phases of the crisis as well as focusing on the relative performance of stakeholder banks; of cooperative banks and savings banks; of tightly federated vs. non-federated and private vs. public savings banks. In section 5 we perform our econometric analysis and comment the results that we obtained. Section 6 concludes.

## **2. The performance of stakeholder owned 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 the performance in the crisis situation. First of all, profit-maximizing banks face the problem that has variously been called “risk shifting” or “asset substitution”: when the 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. 1990; Hermalin, Wallace 1994; Esty 1997). Depositor-controlled or non-profit financial institutions internalize the interests of depositors and thus do not have the incentives for excessive risk taking, and this should be counted as an advantage in a crisis situation (e.g. Rasmusen 1988; Alexopoulos, Goglio 2009; Coco, Ferri 2010). An additional advantage of stakeholder-owned institutions is that they typically have unusually loyal customers and a large part of their liabilities is composed of deposits (e.g. Amess 2001). This is a useful feature in a crisis situation, where alternative sources of (short-term) funding often become unavailable. However, a clear disadvantage of stakeholder-owned banks in crises is their inherent difficulties to raise 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-owned organizations may show greater resilience in crises (Rasmusen 1988; Hermalin, Wallace 1994). However, there are also examples where organizational diversity has been reduced in the crisis due to the collapse of stakeholder-owned banks; examples include Swedish co-operative banks and Finnish savings banks in the Scandinavian banking crises of early 1990s.

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, the *Financial Times* ran on September 2, 2009 a long article entitled “Mutual Suspect”, expressing doubts on the ability of cooperative banks, especially building societies, to deal with the crisis. Almost as a response to that article, *The Economist* published on January 21, 2010 an article entitled “Mutual Respect”, highlighting the good performance of European co-operative banks in the crisis. Also the ILO report by Birchall, Hammond Ketilson (2009) stressed the resilience of cooperative banks in the crisis. Other stakeholder-owned organizations, especially the German publicly-owned savings banks centrals (*Landesbanken*) and the Spanish private savings banks (*cajas*) have been under focus of much discussion.

As it is always possible to find examples of both success stories and failures among all types of organizations in the 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 comparative performance of different organizational types. There are several advantages in using bank ratings in comparing bank performance, which we may best appreciate as contrasted to the main alternative, balance sheet/income statement analysis. When analyzing data coming from a large number of observations, the analyst often does not have all the relevant information that affects the balance sheet; for instance, the impact of major acquisitions or divestments. Also, banks may

strategically manipulate the timing of reported write-downs and inventory valuations, for instance. Since analysis is typically based on annual data, income statements also reflect developments with a lag.

Bank ratings are based on publicly available information, such as income statements and balance sheets, and also to a host of additional information. In essence, ratings consist of a large number of case studies on performance. In this way they embody much more than reported financial information alone. That's why, they should be preferred from an information-theoretic perspective. In other words, they may be deemed more timely versions of the financial reporting data, also potentially affected by substantial measurement errors. They are also easy to interpret and use in regression analysis. Furthermore, timing is a major advantage for the use of ratings in econometric studies, especially when studying a topical issue, as they are readily available, unlike financial statements that may be available only with a lag of around two years.

The most considered ratings of banks are those issued by the three largest credit rating agencies (CRAs: S&P's, Moody's, Fitch). Interpreting bank ratings requires some attention. As argued convincingly by Alessandri, 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. Since the eagerness of such government 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 only exception of Lehman Brothers) – this suggests trying to separate state support in order to tell the true underlying strength of each bank. Being aware of this problem, Moody's and Fitch issue bank's financial strength ratings along with bank's 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 standalone 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 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.<sup>1</sup> To be sure, Poon et al. (1999) already showed 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 correctly classify almost 70 per cent of the BFSRs. Later on, also Fitch started publishing its *support ratings* assessing the likelihood that a bank will need external support to be bailed out. Thus, in our analysis we will focus on Moody's BFSRs and on Fitch bank support ratings.

Unfortunately, this positive view of the rating data may not be the whole story as the use of ratings may lead to new problems. As with any subjective data, subjectivity raises fears of measurement errors, due to possible idiosyncratic errors 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, that is also justified by the desirability to introduce information that is not picked up by standard algorithms; thus this residual subjectivity is both a strength and a cause for concern. However, it is not clear whether this type of measurement error is related in any systematic way to ownership structures.

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

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<sup>1</sup> Following this intuition, Ferri, Liu (2007) estimate large potential government liabilities behind banking systems.

There is some previous literature related to the ratings of bond issues of cooperative and commercial banks. Fischer, Mahfoudhi (2002) study whether the rating agencies do 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 of 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, Roy (2005) find that different factors contribute to the ratings of bonds of cooperative banks than those of commercial banks, suggesting (somewhat in contradiction to Fischer, Mahfoudhi's findings) that the rating process differs. However, these analyses relate to bond issues, and their relevance to bank strength rating may be limited.

We are not aware of much literature where the performance of different organizational forms has been compared by using ratings data. The only exception is the study by Iannotta et al. (2009), which looks at differences in ratings between government-owned banks and private commercial banks. They find that government-owned banks have systematically lower bank ratings than the ratings of private banks. However, they do not divide private banks further into cooperative, savings and commercial banks, neither do they look at how the ratings change over different periods.

Differently from them, we are essentially 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-owned banks differently than profit-maximizing ones since the outburst of the crisis (i.e. comparing the end of 2011 vis-à-vis that of 2006)? Second, was there a variance of the change across finer breakdowns of stakeholder banks (cooperatives vs. savings; tightly federated vs. non-federated cooperatives and public vs. private savings)? And, finally, did that impact change across the three phases in which we can break the crisis (2006-2008 financial crisis; 2008-2009 real sector crisis; 2009-2011 financial crisis again)?

### **3. Data**

Our whole ratings dataset contains monthly observations from 228 banks in 19 European countries from December 1999 until July 2012, making up 34,689 observations in total. The majority of the observations come from Spain (17%) and Italy (15%), followed by UK (12%) and Germany (10.4%). Table 3.1 also presents the distribution of banks by different ownership and by country. We consider five different forms of organizational structures in our sample of banks, namely federated cooperative banks, non-federated cooperative banks, privately owned savings banks, government owned savings banks, and retail commercial banks. These classifications are based on Desrochers, Fischer (2005) and Ferri, Kalmi & Kerola (2010), where more elaborate discussions on these divisions can be found. Briefly explained, tightly federated cooperative banks refer to systems where the cooperative centres have a clearly defined strategic leadership role in the development of the group as a whole, and also have substantial control rights over the member banks, especially in distress situations (even though they are ultimately owned by member banks). In non-federated (or loosely federated) cooperative banks the center typically does not have such rights; at best, the joint governance is based on a consensual network, which is rather non-binding for member banks. Retail commercial banks are most diversified across countries, while for example more than two thirds of private savings bank observations come from Spain, and almost 70% of government owned savings bank observations are concentrated in Germany. Non-federated cooperative bank observations are most common in the United Kingdom (building societies) and Italy (Banche Popolari), while France has more than 45% of federated cooperative bank observations.

All in all, moving from general to specific, we use three breakdowns: i) a “mission-based” breakdown of shareholder (profit maximizing commercial banks) banks vs. stakeholder banks (catering not only for their shareholders and grouping the other four categories); 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 where cooperative banks are further subdivided into tightly federated vs. non-federated and savings banks are also split into private vs. public.

**Table 3.1 Number of observations by countries and the share of each ownership group in total sample**

Country Name	Fitch		Moody's		Countryname	Fed coop	Non-fed coop	Private savings	Gov't savings	Retail com
	Freq. (#)	Percent (%)	Freq. (#)	Percent (%)						
AUSTRIA	3	2.0	5	2.8	AUSTRIA	12.5			4.5	2.6
BELGIUM	4	2.6	4	2.2	BELGIUM					3.4
CYPRUS	3	2.0	3	1.7	CYPRUS					2.6
DENMARK	2	1.3	10	5.5	DENMARK		3.4			7.7
FINLAND	3	2.0	4	2.2	FINLAND	8.3				1.7
FRANCE	13	8.6	12	6.6	FRANCE	45.8				6.0
GERMANY	14	9.3	19	10.5	GERMANY	12.5			68.2	5.1
GREECE	5	3.3	6	3.3	GREECE					6.0
ICELAND		0.0	2	1.1	ICELAND					1.7
IRELAND	7	4.6	8	4.4	IRELAND		6.9			5.1
ITALY	20	13.2	25	13.8	ITALY	8.3	37.9	14.7		15.4
LUXEMBOURG			2	1.1	LUXEMBOURG				4.5	0.9
NETHERLANDS	6	4.0	5	2.8	NETHERLANDS	4.2				5.1
NORWAY	6	4.0	8	4.4	NORWAY			14.7		2.6
PORTUGAL	6	4.0	6	3.3	PORTUGAL				9.1	3.4
SPAIN	33	21.9	28	15.5	SPAIN	4.2	13.8	67.6		11.1
SWEDEN	4	2.6	5	2.8	SWEDEN					4.3
SWITZERLAND	3	2.0	7	3.9	SWITZERLAND	4.2		2.9	13.6	1.7
UNITED KINGDOM	19	12.6	22	12.2	UNITED KINGDOM		37.9			13.7
<b>TOTAL</b>	<b>151</b>	<b>100</b>	<b>181</b>	<b>100</b>	<b>% of total obs</b>	<b>10.6</b>	<b>12.8</b>	<b>15.1</b>	<b>9.7</b>	<b>51.8</b>

With this study we aim at comparing rating performances of banks of different ownership forms by concentrating on Fitch Bank Individual Rating (Fitch IR) and Moody's Banks' Financial Strength (Moody's FS). Both ratings measure the ability of banks or bank groups to survive without outside support. Both agencies take in their ratings into account issues such as financial fundamentals, branch names, risk positions, bank management and overall operating environment.<sup>2</sup>

**Table 3.2 Used ratings and numerical equivalents**

Numerical equivalent	Fitch Individual	Explanation	Moody's Financial Strength	Numerical equivalent
10	A	<b>Very Strong</b>	A	13
9	A/B		A-	12
8	B	<b>Strong</b>	B+	11
7	B/C		B	10
			B-	9
6	C	<b>Adequate</b>	C+	8
5	C/D		C	7
			C-	6
4	D	<b>Problematic</b>	D+	5
3	D/E		D	4
			D-	3
2	E	<b>Serious problems</b>	E+	2
1	F	<b>or default</b>	E	1

In table 3.2 we show ratings and their 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). Fitch IR ceased to exist after December 2011, when Fitch changed bank Individual Ratings on to different scale (with 19 points) and renamed it Viability Ratings. This change in Fitch ratings does not however complicate our regression estimations since our data subsample used in regressions covers a time span from December 2006 until December 2011 (because most recent available bank balance sheet data is from year 2011 which we use as bank-specific control variables in regressions).

#### 4. Descriptive statistics

How have bank ratings evolved during the last decade? A slightly different story is told depending on which of the two rating agencies we look at.

First, figures 1 and 2 present the development of mean ratings of our broader classification, stakeholder vis-à-vis shareholder banks. At both agencies, from 1999 up to 2008, stakeholder banks' ratings were lower than for shareholder banks. As soon as the crisis hit, both bank groups were downgraded quite similarly, but since 2009 for Fitch (2012 Moody's) stakeholder banks' ratings have overcome those of shareholder banks.

<sup>2</sup> See APPENDIX for more information on Fitch Individual Ratings and Moody's Financial Strength Ratings.

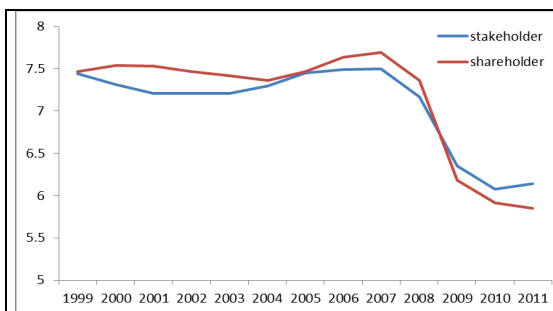


Figure 1: Fitch IR (mean) of stakeholder vs. shareholder banks

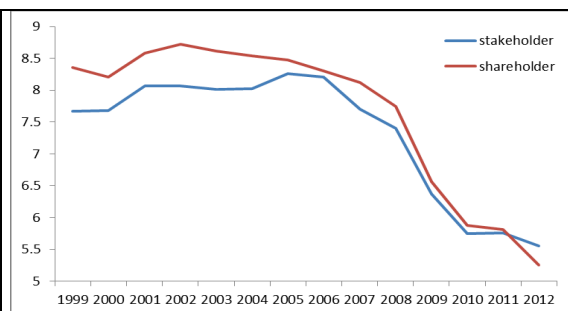


Figure 2: Moody's FS (mean) of stakeholder vs. shareholder banks

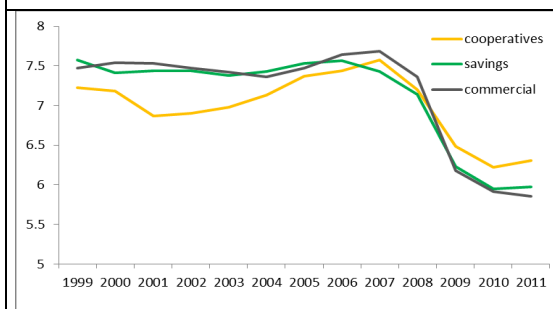


Figure 3: Fitch IR (mean) of cooperatives, savings, and commercial banks

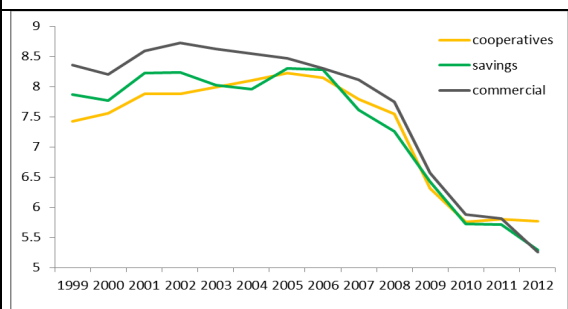


Figure 4: Moody's FS (mean) of cooperatives, savings, and commercial banks

In figures 3 and 4, shareholder banks are further divided into cooperative vs. savings banks. We note that cooperative banks' ratings were lower at first, but the ranking was reversed sooner or later with the crisis.

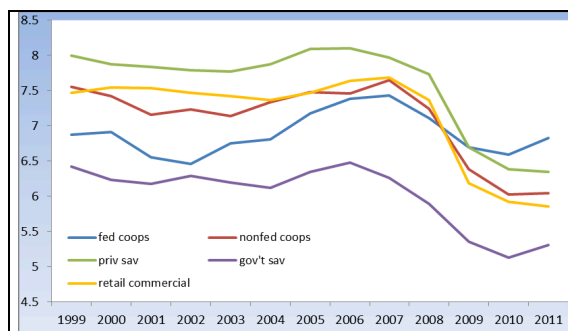


Figure 5: Fitch IR (mean), all ownership groups

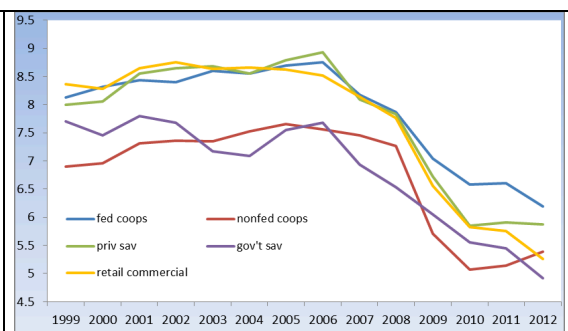


Figure 6: Moody's FS (mean), all ownership groups

Last, we reclassified banks in five different ownership classes, where we made a distinction between loosely (or independent) and tightly federated cooperative banks, savings banks under private or public ownership, the fifth category being again retail commercial banks (figures 5 and 6). The mean Fitch individual ratings seem relatively stable for all of the five groups until the end of 2007, and if anything they were in fact ameliorated between the years 2003 and 2006, except for government owned and private savings banks that stayed rather stable. Then the ratings began to worsen and quite substantially so for retail commercial banks, non-federated cooperative banks and private savings banks. Federated cooperative banks saw only a modest deterioration. Fitch (figure 5) gave government (privately) owned savings banks the worst (best) individual ratings throughout the observation period; although the ratings for the private savings banks deteriorated so that it was the federated cooperative banks that had the best ratings on average in 2010-2011.

However, when looking at Moody's FS ratings, things look slightly different (figure 6). Ratings have worsened already from 2005 onwards, and for almost all ownership groups the amelioration of ratings that was evident in Fitch IR ratings is rather nonexistent. It seems that Moody's FS ratings were somewhat



grouped so that non-federated cooperative banks and government owned savings banks got the worst ratings almost throughout the observation period; while private savings banks, retail commercial banks, and federated cooperative banks were doing much better on average. It was again the federated cooperative banks that got the best financial strength ratings on average after 2009 also from Moody's FS. It is also noteworthy that ratings of non-federated cooperatives have increased as the only group since 2010.

**Table 4.1 Rating differences during crisis**

Average rating changes between 2006-2011											
Fitch IR						Moody's FS					
	mean	# obs	std	min	max		mean	# obs	std	min	max
Shareholder banks	-2.02	61	2.109	-8	1	Shareholder banks	-2.66	76	2.224	-8	2
Stakeholder banks	-1.27	28	1.373	-6	1	Stakeholder banks	-2.47	59	1.851	-6	0
Cooperatives	-0.96	24	1.526	-6	1	Cooperatives	-2.41	32	1.72	-5	0
Savings	-1.62	9	0.726	-6	0	Savings	-2.55	27	2.025	-6	0
<i>fed coop</i>	-0.44	19	1.548	-2	0	<i>fed coop</i>	-2.13	15	1.767	-5	0
<i>nonfed coop</i>	-1.21	15	1.732	-6	1	<i>nonfed coop</i>	-2.65	17	1.693	-5	0
<i>private savings</i>	-2.00	22	1.626	-6	0	<i>private savings</i>	-3.15	13	2.154	-6	0
<i>gov't savings</i>	-1.00	9	0.866	-2	0	<i>gov't savings</i>	-2.00	14	1.797	-6	0

Average changes between 2006-2008											
Fitch IR						Moody's FS					
	mean	# obs	std	min	max		mean	# obs	std	min	max
Shareholder banks	-0.83	65	2.081	-8	1	Shareholder banks	-0.94	80	1.803	-7	2
Stakeholder banks	-0.5	54	0.72	-3	1	Stakeholder banks	-0.97	63	0.949	-3	1
Cooperatives	-0.46	28	0.792	-3	1	Cooperatives	-0.79	34	0.946	-3	1
Savings	-0.54	26	0.647	-2	0	Savings	-1.17	29	0.928	-3	1
<i>fed coop</i>	-0.33	9	1.000	-3	0	<i>fed coop</i>	-1.06	16	1.062	-3	0
<i>nonfed coop</i>	-0.53	19	0.696	-2	1	<i>nonfed coop</i>	-0.56	18	0.783	-2	1
<i>private savings</i>	-0.65	17	0.702	-2	0	<i>private savings</i>	-1.33	15	0.816	-3	0
<i>gov't savings</i>	-0.50	12	0.674	-2	0	<i>gov't savings</i>	-1.00	14	1.037	-3	1

Average changes between 2008-2009											
Fitch IR						Moody's FS					
	mean	# obs	std	min	max		mean	# obs	std	min	max
Shareholder banks	-1.05	75	1.800	-7	3	Shareholder banks	-1.46	97	1.514	-7	0
Stakeholder banks	-0.81	72	1.083	-5	0	Stakeholder banks	-1.44	80	1.421	-5	0
Cooperatives	-0.63	35	1.165	-5	0	Cooperatives	-1.6	40	1.481	-5	0
Savings	-0.97	37	0.985	-5	0	Savings	-1.27	40	1.358	-4	0
<i>fed coop</i>	-0.18	11	0.603	-2	0	<i>fed coop</i>	-1.24	17	1.300	-4	0
<i>nonfed coop</i>	-0.83	24	1.308	-5	0	<i>nonfed coop</i>	-1.87	23	1.575	-5	0
<i>private savings</i>	-1.04	25	1.059	-5	0	<i>private savings</i>	-1.82	22	1.368	-4	0
<i>gov't savings</i>	-0.83	12	0.835	-2	0	<i>gov't savings</i>	-0.61	18	1.037	-3	0

Average changes between 2009-2011											
Fitch IR						Moody's FS					
	mean	# obs	std	min	max		mean	# obs	std	min	max
Shareholder banks	-0.24	72	0.927	-3	2	Shareholder banks	-0.31	96	0.862	-4	1
Stakeholder banks	0.05	72	0.554	-1	3	Stakeholder banks	-0.06	79	0.539	-4	1
Cooperatives	0.03	36	0.609	-1	3	Cooperatives	-0.02	40	0.276	-1	1
Savings	0.08	36	0.5	-1	2	Savings	-0.1	39	0.718	-4	1
<i>fed coop</i>	0.17	12	1.029	-1	3	<i>fed coop</i>	0.00	18	0.342	-1	1
<i>nonfed coop</i>	-0.04	24	0.204	-2	0	<i>nonfed coop</i>	-0.05	22	0.213	-1	0
<i>private savings</i>	-0.04	23	0.367	-1	1	<i>private savings</i>	0.10	21	0.300	0	1
<i>gov't savings</i>	0.31	13	0.630	0	2	<i>gov't savings</i>	-0.33	18	0.970	-4	0

Table 4.1 presents differences between individual banks' ratings during the crisis, for which we measure the start in December 2006 and the end in December 2011. At the start, things looked good and if anything, bank ratings had been raised by both agencies (as already noticed in figures 1 and 2). We then take the changes in the period; the bigger is the change, the larger is the respective deterioration in ratings. We look at the differences in ratings for stakeholder and shareholder banks, we also subdivide stakeholder banks into cooperative vs. savings banks; and further into federated cooperative banks vs. non-federated (or independent) cooperative banks and private vs. public savings banks. The crisis is also divided into three phases so we examine the rating changes in all of these stages separately.

Looking first at the whole crisis period and at Fitch Individual ratings (top left hand side panel), shareholder banks had the highest mean difference (so their ratings deteriorated the most). There were banks whose rating dropped by 8 points (on a 10 point scale). Also non-federated cooperative banks had on average a rating about 1.2 points and private savings banks 2 points lower respectively in December 2011 compared to the situation 5 years before. The average rating difference is notably lower for federated cooperative banks; even the worst banks saw their ratings deteriorate by 2 points only.

With Moody's Financial Strength ratings (top right hand side panel) still the shareholder banks had a larger absolute rating decrease during the 5-year period. Inside stakeholder banks, the ratings of non-federated



cooperatives and of private savings banks dropped as much as or even more than for shareholder banks (2.65 points for non-federated cooperative banks and 3.15 for private savings banks on a 13 point scale). The rating dropped from a B- (9) to E (1) for one of the shareholder banks. Ratings fell more than 2 points also for federated cooperative banks and public savings banks; in all, it seems that there were no big differences between different ownership groups with Moody's FS deteriorations.

Focusing on the different phases of the crisis we can detect some interesting actions. Concentrating first on Fitch IR, as the crisis went on, the relative outperformance of the stakeholder banks decreased (absolute values of rating deteriorations become somewhat closer to shareholder banks). During the first phase of the crisis, stakeholder banks showed relatively little heterogeneity; whereas moving on to the second phase of the crisis federated cooperative banks experienced stunningly small rating deteriorations compared to other classes of stakeholder banks. During 2009-2011 changes in ratings already turned to be positive for stakeholder banks as a whole; still non-federated cooperative banks and private savings banks were experiencing rating deteriorations on average.

For Moody's FS rating changes differed less noticeably between shareholder banks and different categories of stakeholder banks. Some small differences arose with non-federated cooperatives, which were downgraded less during the first phase of the crisis vis-à-vis the other bank groups, and government owned savings banks experiencing relatively less severe downgrades during the second phase. In the last phase of the crisis, the difference between rating changes of stakeholder vs. shareholder banks is clearly larger than in the other time spans considered. While on average stakeholder banks' ratings were decreasing also during the last phase of the crisis federated cooperative banks' ratings remained unchanged and private savings banks' ratings did in fact experience an increase.

**Table 4.2 Summary statistics mean and standard deviation (in small italics)**

Ownership	Fitch	Moody's	Income	Costs	Capital	Size	Loanloss	Loans	Net interest Income Ratio
Shareholder banks	<b>6.752</b>	<b>6.938</b>	<b>0.024</b>	<b>0.016</b>	<b>0.056</b>	<b>18.065</b>	<b>0.007</b>	<b>0.606</b>	<b>0.684</b>
	<i>1.892</i>	<i>2.249</i>	<i>0.011</i>	<i>0.010</i>	<i>0.030</i>	<i>1.726</i>	<i>0.007</i>	<i>0.184</i>	<i>0.252</i>
Stakeholder banks	<b>6.733</b>	<b>6.718</b>	<b>0.021</b>	<b>0.015</b>	<b>0.061</b>	<b>17.440</b>	<b>0.005</b>	<b>0.656</b>	<b>0.744</b>
	<i>1.589</i>	<i>1.963</i>	<i>0.010</i>	<i>0.008</i>	<i>0.026</i>	<i>1.533</i>	<i>0.006</i>	<i>0.177</i>	<i>0.277</i>
Cooperative banks	<b>6.822</b>	<b>6.780</b>	<b>0.021</b>	<b>0.014</b>	<b>0.060</b>	<b>17.368</b>	<b>0.005</b>	<b>0.650</b>	<b>0.717</b>
	<i>1.527</i>	<i>1.935</i>	<i>0.012</i>	<i>0.009</i>	<i>0.027</i>	<i>1.673</i>	<i>0.006</i>	<i>0.190</i>	<i>0.275</i>
Savings banks	<b>6.647</b>	<b>6.653</b>	<b>0.021</b>	<b>0.015</b>	<b>0.062</b>	<b>17.526</b>	<b>0.006</b>	<b>0.662</b>	<b>0.769</b>
	<i>1.649</i>	<i>1.991</i>	<i>0.009</i>	<i>0.008</i>	<i>0.249</i>	<i>1.383</i>	<i>0.005</i>	<i>0.164</i>	<i>0.278</i>
Federated cooperative banks	<b>6.971</b>	<b>7.412</b>	<b>0.019</b>	<b>0.014</b>	<b>0.053</b>	<b>17.900</b>	<b>0.005</b>	<b>0.512</b>	<b>0.687</b>
	<i>1.491</i>	<i>1.987</i>	<i>0.012</i>	<i>0.008</i>	<i>0.029</i>	<i>2.129</i>	<i>0.006</i>	<i>0.204</i>	<i>0.361</i>
Non-federated cooperative banks	<b>6.748</b>	<b>6.245</b>	<b>0.022</b>	<b>0.018</b>	<b>0.065</b>	<b>16.985</b>	<b>0.005</b>	<b>0.742</b>	<b>0.738</b>
	<i>1.539</i>	<i>1.718</i>	<i>0.011</i>	<i>0.010</i>	<i>0.024</i>	<i>1.097</i>	<i>0.006</i>	<i>0.095</i>	<i>0.194</i>
Private Savings banks	<b>7.149</b>	<b>7.015</b>	<b>0.024</b>	<b>0.016</b>	<b>0.070</b>	<b>17.100</b>	<b>0.007</b>	<b>0.733</b>	<b>0.777</b>
	<i>1.491</i>	<i>1.906</i>	<i>0.007</i>	<i>0.007</i>	<i>0.022</i>	<i>1.267</i>	<i>0.006</i>	<i>0.125</i>	<i>0.281</i>
Government owned savings banks	<b>5.662</b>	<b>6.202</b>	<b>0.017</b>	<b>0.012</b>	<b>0.047</b>	<b>18.197</b>	<b>0.004</b>	<b>0.552</b>	<b>0.757</b>
	<i>1.473</i>	<i>2.003</i>	<i>0.009</i>	<i>0.008</i>	<i>0.022</i>	<i>1.288</i>	<i>0.004</i>	<i>0.157</i>	<i>0.274</i>
Full sample	<b>6.743</b>	<b>6.841</b>	<b>0.023</b>	<b>0.015</b>	<b>0.058</b>	<b>17.755</b>	<b>0.006</b>	<b>0.631</b>	<b>0.713</b>
	<i>1.754</i>	<i>2.130</i>	<i>0.011</i>	<i>0.009</i>	<i>0.029</i>	<i>1.661</i>	<i>0.006</i>	<i>0.183</i>	<i>0.267</i>

Table 4.2 presents summary statistics of the main bank-specific variables for our regression estimations subsample period (2006-2011), broken into mission-based classification (shareholder vs. stakeholder); ownership-based classification (cooperative and savings banks); and further into organizational/ownership-based classification with four different ownership groups.<sup>3</sup> These variables are used as main explanatory variables in the analysis and they are roughly similar to those used by Iannotta et al. (2009) in their study on bank ratings. As one can see, on average, government owned savings banks obtain the worst individual

<sup>3</sup> Data were cleaned from outliers omitting the smallest and largest 1% of observations from summary statistics and regressions. We also excluded 3 banks whose variable loanloss provisions / total loans was getting negative values.

ratings from both Fitch and Moody's. Overall, in our data, the correlation between Moody's FS and Fitch IR is 0.7125. With Fitch IR, ratings have been on average very close to each other among shareholder and stakeholder banks, while Moody's issued better ratings on average to shareholder banks. Cooperative banks slightly outperformed savings banks with both Moody's and Fitch ratings, while if turning to most refined classifications, the best ratings during crisis on average were given to private savings banks (looking at Fitch IR) and to federated cooperative banks (Moody's FS) during crisis period (2006-2011).

Income (standing for the ratio between operating income and total assets), is lowest for government owned savings banks and highest for shareholder banks. With respect to costs (the ratio between operating costs and total assets), government owned savings banks have on average the lowest cost-to-asset ratio, followed closely by federated cooperative banks. Shareholder banks stand at the other end of the distribution. As to capital – computed as the ratio between equity and total assets – private savings banks are the most endowed, while federated cooperative banks and government owned savings banks have the lowest ratios. Size (computed as the log of total assets) is smallest on average among non-federated cooperative banks and private savings banks; largest banks on average being government owned savings banks. Loanloss is the proportion of loan loss provisions on banks' total loans, and it seems that private savings banks and shareholder banks are doing most poorly in that respect; while government owned savings banks seem to have the smallest proportions of loan loss provisions during the recent crisis. When looking at loans (total loans on total assets) it is the non-federated cooperative and private savings banks that have the highest proportion of loans on their balance sheets, while federated cooperative banks have the smallest proportion. We also looked at the ratio between net interest income (difference between interest payments bank receives on loans outstanding and interest payments bank makes to customers on their deposits) and total operating income, a proxy for banks' business model; and it seems that on average both public and private savings banks' net interest income counts more than 75% of their total operating income. For federated cooperative banks and shareholder banks, the ratio is below 70%.

## 5. Regression estimations

Our regression estimations are all conducted with OLS using cluster- and heteroskedasticity-robust standard errors. The dependent variable is the change in ratings (from later date to earlier), so if the rating has changed from 8 in 2006 to 5 in 2008, the dependent variable is -3. That way, if the sign of the coefficient is positive, it indicates a less severe downgrading; while being negative it adds to the severity of the decrease in rating. In all specifications where bank-specific balance sheet variables were used as explanatory variables, they were all lagged such that they were measured at their initial value (they are thus measured at the beginning of each estimation period).

We first ran regressions where rating changes were regressed against ownership dummies. Table 5.1 present the results. Three different specifications emerge: one with stakeholder vs. shareholder banks (stakeholder bank dummy), one where stakeholder banks have been further divided between cooperatives and savings (cooperative and savings dummy), and one with cooperative and savings banks further both divided in two subgroups (by organizational/ownership classes). Each specification includes two sets of regressions, one where the dependent variable is the change in Fitch IR ratings, and one where the dependent variable is the change in Moody's FS ratings. Further we have divided the set of regressions for each rating agency in four: one specification for the entire time span (dependent variable: change in ratings from 2006 to 2011), one for the first phase of the crisis (dependent variable: change in ratings from 2006 to 2008), one for the second phase of the crisis (dependent variable: change in ratings from 2008 to 2009), and one for the third phase of the crisis (dependent variable: change in ratings from 2009 to 2011).

**Table 5.1 Results with ownership dummies**

	Stakeholder bank dummy								Cooperative and savings dummy								Four ownership classes							
	FITCH				MOODY'S				FITCH				MOODY'S				FITCH				MOODY'S			
	2006-2011	2006-2008	2008-2009	2009-2011	2006-2011	2006-2008	2008-2009	2009-2011	2006-2011	2006-2008	2008-2009	2009-2011	2006-2011	2006-2008	2008-2009	2009-2011	2006-2011	2006-2008	2008-2009	2009-2011	2006-2011	2006-2008	2008-2009	2009-2011
stakeholder bank dummy	.662**	0.291	0.194	0.343**	0.2101	0.0702	-0.0518	0.248**																
Cooperative bank dummy									.874**	0.289	0.371	.315**	0.136	0.149	-0.193	.286**								
Savings bank dummy									0.481	0.293	0.027	.370**	0.277	-0.002	0.0929	0.2087								
Federated cooperative bank																	1.405**	0.437	0.818**	0.454	0.4375	-0.049	0.2012	0.3113**
Independent cooperative bank																	0.594	0.211	0.166	0.245**	-0.147	0.336	-0.501	0.265**
Private savings bank																	0.305	0.3208	-0.04	.244*	0.0789	0.082	-0.45	0.406**
Public savings bank																	0.805**	0.2375	0.166	0.595**	0.5	-0.1078	.756**	-0.022
Constant	-1.805**	-7.37**	-1**	-.287**	-2.5**	-.892**	-1.367**	-.3113**	-1.805**	-7.37**	-1**	-.287**	-2.5**	-.892**	-1.367**	-.3113**	-1.805**	-7.37**	-1**	-.287**	-2.5**	-.892**	-1.367**	-.311**
Number of observations #	140	145	154	152	167	175	187	185	140	145	154	152	167	175	187	185	140	145	154	152	167	175	187	185
R <sup>2</sup> Adjusted	0.0273	0.0024	-0.0021	0.0389	-0.0034	-0.0051	-0.0051	0.0214	0.0257	-0.0045	-0.0022	0.0329	-0.0089	-0.0097	-0.0063	0.0171	0.0258	-0.0176	-0.0046	0.0341	-0.0147	-0.0167	0.0329	0.0239

Results indicate that both Fitch and Moody’s seem to favor stakeholder banks – relative to shareholder banks – as their ratings were less severely downgraded especially during the third phase of the crisis. More specifically, it was the independent cooperative banks and public savings banks that were hit less hard with Fitch rating changes, and both groups of cooperative banks as well as private savings banks that result in less severe downgrades among stakeholder banks with Moody’s financial strength ratings. However, the explanatory power of this simple regression is extremely weak as can be seen from the adjusted R<sup>2</sup>-figures. Next, in table 5.2, we included country dummies in the regressions (otherwise coinciding with table 5.1). With country dummies included, we already got much higher explanatory power. When looking at the first set of regressions, where stakeholder banks are viewed against shareholder banks, the stakeholder bank dummy is significant in neither phase of the crisis. For Fitch it is positive throughout the crisis, for Moody’s negative for the whole crisis period as well as for the first phase. When stakeholder banks are further divided into cooperatives and savings banks, Fitch seems to downgrade less severely cooperative banks for the whole time period (2006-2011) and especially for the second phase of the crisis (2008-2009). Savings banks got a positive and significant (at 10% level) coefficient for the third part of the crisis (2009-2011). With Moody’s ratings changes coefficients are not statistically significant for either cooperative or savings banks.

**Table 5.2 Results with ownership and country dummies**

	Stakeholder bank dummy								Cooperative and savings dummy								Four ownership classes							
	FITCH				MOODY'S				FITCH				MOODY'S				FITCH				MOODY'S			
	2006-2011	2006-2008	2008-2009	2009-2011	2006-2011	2006-2008	2008-2009	2009-2011	2006-2011	2006-2008	2008-2009	2009-2011	2006-2011	2006-2008	2008-2009	2009-2011	2006-2011	2006-2008	2008-2009	2009-2011	2006-2011	2006-2008	2008-2009	2009-2011
stakeholder bank dummy	0.336	0.082	0.272	0.190	-0.032	-0.096	0.057	0.101																
Cooperative bank dummy									0.616**	0.161	.590**	0.164	0.072	0.108	0.082	0.118								
Savings bank dummy									-0.018	-0.021	-0.179	0.227*	-0.152	-0.329	0.025	0.080								
Federated cooperative bank																	.691**	0.078	0.367	0.267	-0.244	-0.305	-0.103	0.206
Independent cooperative bank																	0.546	0.203	.678*	0.111	0.381	0.487	0.220	0.049
Private savings bank																	-0.300	-0.017	-0.429	.280*	-0.111	-0.059	-0.338	.165**
Public savings bank																	0.475	-0.03335	0.255	0.145	-0.257	-0.750**	0.490	-0.019
Switzerland	6.887**	7.305**	1.424**	0.655	5.87**	6.048**	0.048	-0.063	7.006**	7.340**	-1.274	0.636	5.912**	6.164**	0.061	-0.055	7.105**	7.33**	-1.190	0.644	5.918**	6.260**	-0.044	-0.039
France	7.193**	7.632**	-.812**	-0.010	5.09**	5.715**	-.693**	-0.051	7.076**	7.599**	-.534**	0.001	5.043**	5.612**	-.704**	-0.059	7.045**	7.634**	-.449**	-0.043	5.189**	5.819**	-0.619	-0.103
Belgium	4.333**	5.5**	-0.75	0.000	4**	4.166**	-0.417	0.250	4.333**	5.5**	-0.75	0.000	4**	4.166**	-0.417	0.250	4.333**	5.5**	-0.75	0.000	4**	4.166**	-0.417	0.250
Ireland	2.132**	7.583**	-.450**	-.911**	2.131**	5.940**	-.368**	-0.150	2.076**	7.567**	-.459**	-.903**	2.105**	5.889**	-.368**	-0.154	2.090**	7.559**	-.462**	-.889**	2.029**	5.795**	-.372**	-0.137
Spain	6.614**	7.409**	-1.046**	-.360**	3.7**	5.644**	-.181**	0.015	6.328**	7.460**	-.811**	-.378**	3.741**	5.732**	-.180**	0.020	6.492**	7.457**	-.661**	-.407**	3.708**	5.558**	-.164**	-0.008
Netherlands	5.945**	7.319**	-.878**	-.074	5.338**	5.849**	-0.176	-.350**	5.897**	7.307**	-.931**	-0.270	5.321**	5.82**	-0.180	-.352**	5.884**	7.320**	-.894**	-0.283	5.374**	5.884**	-0.149	-.367*
Italy	7.509**	7.907**	-.386**	-.161**	5.777**	5.983**	-0.092	-.196**	7.378**	7.875**	-.545**	-0.146	5.777**	5.969**	-0.094	-.197**	7.4115**	7.857**	-.573**	-0.126	5.733**	5.889**	-0.048	-.204**
UK	5.739**	6.702**	-1.786**	0.005	3.864**	5.756**	-2.19**	-0.101	5.614**	6.669**	-.194**	0.019	3.813**	5.662**	-.2205**	-0.109	5.646**	6.651**	-1.98**	0.047	3.678**	5.491**	-.227**	-0.075
Finland	7.775**	7.944**	-0.182	-0.127	4.010**	5.365**	-.945**	-0.301	7.589**	7.892**	-0.394	-0.109	3.976**	5.297**	-.957*	-0.309	7.538**	7.947**	-0.245	-0.178	4.081**	5.435**	-0.865	-0.353
Sweden	7.75**	7.75**	-0.25	0.250	4.2**	5.866**	-1.66**	0.000	7.75**	7.75**	-0.25	0.250	4.2**	5.866**	-1.667**	0.000	7.75**	7.75**	-0.25	0.250	4.2**	5.866**	-1.667**	0.000
Austria	6.331**	7.958**	-1.636**	-0.095	4.76**	6.324**	-1.70**	-0.051	6.509**	8.010**	-1.41**	-0.113	4.770**	6.289**	-1.70**	-0.049	6.262**	8.022**	-1.62**	-0.073	4.875**	5.889**	-1.72**	-0.047
Cyprus	8.666**	8.666**	0.000	0.000	7.333**	7.66**	0.333	-.6667**	8.666**	8.666**	0.000	0.000	7.333**	7.666**	0.333	-.667**	8.666**	8.666**	0.000	0.000	7.333**	7.666**	0.333	-.667**
Denmark	7.5**	8**	-0.5	0.000	4.8**	6.066**	-.107**	-0.010	7.5**	8**	-0.5	0.000	4.8**	6.066**	-.107**	-0.012	7.5**	8	-0.5	0.000	4.8**	6.066**	-.108**	-0.005
Greece	5**	7.666**	-0.333	-2.333**	4.148**	7.238**	-0.238	-.285**	5**	7.666**	-0.333	-2.333**	4.148**	7.238**	-0.238	-.285**	5**	7.666**	-0.333	-2.333**	4.142**	7.238**	-0.238	-.285**
Germany	6.509**	7.298**	-1.181**	0.207	5.275**	6.284**	-0.557	-.521**	6.703**	7.358**	-.931**	0.186	5.322**	6.381**	-0.543	-.511**	6.402**	7.372**	-1.17**	0.228	5.427**	6.675**	-.771**	-.47*
Portugal	7.265**	7.966**	-.424**	-0.276	3.667**	5.532**	-1.68**	-0.200	7.407**	8.008**	-0.274	-0.291	3.717**	5.609**	-1.67**	-0.193	7.210**	8.013**	-0.418	-0.258	3.752**	5.795**	-1.83**	-0.160
Luxembourg	3	0.00	(omitted)	0.000	5.285**	4.941**	0.314	-0.025	3	0.00	(omitted)	0.000	5.288**	4.997**	0.325	-0.020	3	0.00	3**	0.000	5.314**	5.105**	0.169	-0.005
Norway	7.609**	8.278**	-.681**	-0.127	5.723**	6.865**	-.112**	-0.063	7.845**	8.365**	-.081	-0.151	5.802**	6.997**	-1.109*	-0.050	8.036**	8.344**	-0.214	-0.187	5.777**	6.843**	-.901**	-.103*
Constant	-8	-.8**	0.00	0.00	-7**	-6.66**	-0.333	0.000	-8**	-.8**	0.00	0.00	-7**	-6.667**	-0.33	0.00	-8.00	-8.00	0.00	0.00	-7**	-6.667**	-0.333	0.00
Number of observations #	140	145	154	152	167	175	187	185	140	145	154	152	167	175	187	185	140	145	154	152	167	175	187	185
R <sup>2</sup> Adjusted	0.5220	0.3946	0.3070	0.3580	0.2372	0.3840	0.3687	0.4988	0.5280	0.3908	0.3229	0.3536	0.2331	0.3882	0.3650	0.4960	0.5254	0.3811	0.3207	0.3461	0.2264	0.3986	0.3723	0.4943

Dividing banks further in more specific organization/ownership categories, Fitch seems to downgrade less severely federated cooperative banks for the whole crisis period, non-federated cooperative banks during the second part of the crisis, and private savings banks during the last phase. Moody’s financial strength rating changes seemed to be less harsh for private savings banks during the last phase of the crisis, while public savings banks seem to be hit harder during the first phase.

We then turn to the final specifications where we control for the bank-specific variables presented in table 4.2. The first set of regressions focuses on the difference in the rating changes for stakeholder vis-à-vis shareholder banks. The results (table 5.3) indicate that stakeholder banks saw improvements in their Fitch ratings relative to shareholder banks during the second and third phases of the crisis period. Moody's, instead, issues more severe downgrades on stakeholder banks' ratings during the first phase.

**Table 5.3 Results with stakeholder bank dummy, bank balance sheet controls and country controls**

FITCH					MOODY'S				
	2006-2011	2006-2008	2008-2009	2009-2011		2006-2011	2006-2008	2008-2009	2009-2011
stakeholder bank dummy	0.32361868	0.03000645	.51692195*	0.28077373*	stakeholder bank dummy	-0.3151753	-.33820554*	0.09801563	0.08341671
Income	32.936331	34.36184	37.849365*	-23.239671	Income	10.816811	11.788703	10.82931	9.1196964*
Costs	25.608584	15.541737	-33.114466	34.704749	Costs	45.632526	25.223929	1.041262	-23.499928
Capital	3.079681	1.9420696	1.039358	1.9038162	Capital	7.8521747	-1.0327568	10.510597**	-0.19405698
Size	-0.08051105	-0.03074574	-0.07404409	-0.02167254	Size	-.45222643***	-.21107646***	.21888399***	-0.00610547
Loanloss	-158.03837**	17.300688	-19.467786	28.888161	Loanloss	-145.94227**	-79.593562**	-65.954256***	6.2991633
Loans	-3.0795832**	-2.3973533*	-0.94050504	-0.86799484	Loans	-4.3252187**	-0.41548028	-2.5391051***	-0.18013112
Net interest income	1.2563323	1.3761112	-0.71360767	0.85099654	Net interest income	2.4355001*	0.83445641	0.23443006	0.0237789
Switzerland	-0.7324335	7.2657384***	0.40262193	1.8326066**	Switzerland	5.0824461***	6.0417722***	-0.1430862	-0.04507875
France	0.38798967	7.8469523***	1.1198851***	.84510046**	France	4.6101815**	6.0448443***	-0.48936433	0.03123658
Belgium	-2.4213223***	5.7329694***	1.2597343	(omitted)	Belgium	3.0471598**	4.3815633**	-0.32049526	(omitted)
Ireland	-4.1783082***	8.1737658**	-2.2846828***	-1.4659992*	Ireland	0.74689496	5.574694**	-3.0713021***	-0.28958346
Spain	0.09449981	7.8870163***	.80108531**	0.10179032	Spain	3.0957179**	5.6854627***	-1.5923314***	-0.0662799
Netherlands	-0.34288964	8.1319823***	1.0016082*	0.43898091	Netherlands	4.6655947***	5.8445297***	0.22354787	-4.4383553*
Italy	.66147733**	7.5653942***	1.3217452**	.50604424*	Italy	4.2875456**	5.5124155***	-0.15037725	-2.1845641*
UK	-0.69664817	7.5739738***	0.13588379	0.37369717	UK	3.1328363***	6.0338244***	-1.9668789***	0.00482972
Finland	0.55216104	8.1948043***	1.0642068**	.52310584*	Finland	2.6110969**	5.275374***	-1.3238982***	-0.36809029
Sweden	1.4348057**	8.5970766***	1.4467577***	.88830806**	Sweden	3.8215437**	5.9192244**	-1.3199204**	-0.0121343
Austria	(omitted)	7.8141804***	0.27378516	(omitted)	Austria	4.0655805***	6.6148492***	-1.9344401**	-0.19426304
Cyprus	2.2205007***	8.1027713***	1.4603937***	.53583196**	Cyprus	5.5854074***	7.4842425***	(omitted)	-1.1386363***
Denmark	1.0957262*	8.8426068***	1.5408928***	.44848428**	Denmark	3.2979532**	5.594295**	-.99239066***	-0.18556081
Greece	-1.8217881***	7.215242***	1.5714314***	-1.8975904***	Greece	3.1771708**	7.0526841***	0.44009452	-3.0267002***
Germany	-0.09197248	7.8597822***	0.88659112	0.48339712	Germany	4.3697271***	6.5420489**	-0.35906236	-0.25097706
Portugal	0.94940129	8.3072407***	1.196678**	.62305593*	Portugal	2.8827236**	5.3422265**	-1.3687992***	-0.3450393
Luxembourg	-4.0926895***	(omitted)	0.76903192	(omitted)	Luxembourg	3.2458115*	4.2710617**	0.19817218	-0.15152801
Norway	1.1472007*	9.1969611***	1.0411002*	.68674466**	Norway	4.7716182**	6.4248596**	-1.0175387**	-0.07692505
Constant	0.06315301	-8.3901048***	0.47400648	-0.23949251	Constant	2.2540152	-3.418957*	4.4821642***	0.15013004
Number of observations #	128	134	134	109		153	160	163	129
R <sup>2</sup> Adjusted	0.51910077	0.38172977	0.37903519	0.54738811		0.38899251	0.49270206	0.53624264	0.676691

\* statistical significance \*p<.1; \*\*p<.05; \*\*\*p<.01. Income= operating income /total assets; Costs= operating costs /total assets; Capital= equity /total assets; Size= log(total assets); Loanloss= loan losses provisions /total loans; Net interest income= net interest income /total operating income. All bank specific variables lagged for their initial values

Bank-specific variables seem to be largely statistically insignificant for Fitch ratings' changes, whereas size and relative share of loan losses seem to indicate more severe downgrades on Moody's ratings. Statistically, country dummies seem to lose their significance as the crisis drags on.

The second set of regressions focuses on whether there were significant differences in rating changes within the stakeholder banks, namely between cooperatives and savings banks. As can be seen from Table 5.4, for Fitch it seems that the cooperative banks count for the relative improvement in ratings vis-à-vis shareholder banks during the second and third phase of the crisis, while the savings bank dummy is statistically insignificant. As for Moody's, the poorer ratings for stakeholder banks during the first phase of the crisis period appear to be triggered by the savings banks that were downgraded more severely. Here, the cooperative bank dummy remain statistically insignificant throughout the estimation time span.

**Table 5.4 Results with cooperative and savings banks dummies, bank balance sheet and country controls**

FITCH					MOODY'S				
	2006-2011	2006-2008	2008-2009	2009-2011		2006-2011	2006-2008	2008-2009	2009-2011
Cooperative bank dummy	.81759735**	0.12706456	0.72062405*	0.49711485**	Cooperative bank dummy	-0.16425898	-0.17231563	0.05109168	0.04324201
Savings bank dummy	-0.29193864	-0.09753685	0.25398154	0.11675238	Savings bank dummy	-0.48896828	-.5229678**	0.14996566	0.11643796
Income	35.935029	34.560084	35.695938*	-22.924062	Income	11.567732	12.808292	10.356921	8.5639469
Costs	35.425694	17.91835	-28.398621	33.293697	Costs	46.675753	26.633333	0.81861062	-23.91731
Capital	3.1565092	1.9507618	0.82695427	2.597678	Capital	7.8802396	-1.0079363	10.61088**	-0.1742998
Size	-0.06926302	-0.02914221	-0.06659816	-0.01429423	Size	-4.536625***	-2.1152544***	-2.1920483***	-0.00747436
Loanloss	-183.7352***	12.472515	-22.56057	32.239313	Loanloss	-148.61326**	-82.885538**	-65.961121***	6.2151333
Loans	-3.9434919***	-2.561032*	-1.0928659	-1.095252*	Loans	-4.4362935***	-.5204693	-2.5202778***	-0.16908071
Net interest income	1.8313057	1.4897051	-0.71179817	0.76578286	Net interest income	2.4498042*	0.87378118	0.23781144	0.0257154
Switzerland	-0.98766234	7.3018626***	-1.1497054*	1.3856211**	Switzerland	5.1423372***	6.130482***	-0.17087351	-0.06505819
France	-0.16299869	7.8194328***	-0.52279885	0.33138419	France	4.5229132***	5.9395402***	-0.46613331	0.05111103
Belgium	-2.834155***	5.7281578***	-0.32667605	-0.40673709	Belgium	3.0370311***	4.3648325***	-0.32301604	(omitted)
Ireland	-4.5164264***	8.1885516***	-3.8526266***	-1.9318819**	Ireland	0.72356127	5.5374782***	-3.0644999***	-0.29007032
Spain	0.23971789	8.0020062***	-0.56552834	-0.22430968	Spain	3.1851484***	5.7796608***	-1.6147434***	-0.07335876
Netherlands	-0.63946547	8.1528794***	-0.55678668	0.04295533	Netherlands	4.6554425***	5.8233826***	0.227391	-4.4648667*
Italy	0.10163896	7.5421297***	-0.31668498	-0.0295449	Italy	4.279831***	5.4919967***	-0.14795211	-2.0956666*
UK	-1.1399235	7.5694544***	-1.5046447**	-0.14860602	UK	3.0674876**	5.9504265***	-1.9440944***	0.02556345
Finland	-0.11374783	8.1472032***	-0.63068454	-0.03168887	Finland	2.5528889**	5.2085608***	-1.3029671**	-0.35502735
Sweden	1.2147065*	8.6358972***	-0.08935345	0.47718359	Sweden	3.8381937***	5.9278421***	-1.3261769**	-0.01642586
Austria	(omitted)	7.8971778***	-1.4192747**	(omitted)	Austria	4.0706143***	6.576519***	-1.9206368***	-0.18575364
Cyprus	1.9398608***	8.1267657***	-0.05650365	0.10470817	Cyprus	5.5799629***	7.4723206***	(omitted)	-1.1372345***
Denmark	0.80543257	8.866653***	(omitted)	0.02464564	Denmark	3.2913874***	5.5776289***	-9.98968557***	-0.17412471
Greece	-2.1494283***	7.2310429***	0.03694271	-2.312589***	Greece	3.1763623***	7.0413828***	0.44435651	-3.0204919***
Germany	-0.07602661	7.9479616***	-0.58716545	0.13767387	Germany	4.4504043***	6.6170812***	-0.38044453	-0.26903694
Portugal	0.99151496	8.39666**	-0.21966767	.35943319*	Portugal	2.9505788***	5.4038266***	-1.3894169***	-0.36140787
Luxembourg	-4.5091906***	(omitted)	(omitted)	0.32413425	Luxembourg	3.2520376*	4.2756609***	0.17400979	-0.16676891
Norway	1.4185056**	9.3345904***	-0.28698288	.44907904*	Norway	4.893622***	6.5419074***	-1.0563372**	-0.10233532
Constant	-1.5261425	-8.4480544***	1.9593482	0.162921	Constant	2.2995819	-3.4085281*	4.4856513***	0.18293954
Number of obs #	128	134	134	109		153	160	163	129
R 2 adjusted	0.545226	0.378332	0.381171	0.5531738		0.386551	0.495653	0.533237	0.6742357

\* statistical significance \*p<.1; \*\*p<.05; \*\*\*p<.01. Income= operating income /total assets; Costs= operating costs /total assets; Capital= equity /total assets; Size= log(total assets); Loanloss= loan loss provisions /total loans; Net interest income= net interest income /total operating income. All bank specific variables lagged for their initial values

In the third set of regressions we further move towards more specific categorizations and focus on whether there was a significant difference in the rating changes within the stakeholder banks across the four identified ownership/organization classes: tightly federated cooperatives vs. non-federated cooperatives; private vs. public savings banks (table 5.5). We can now detect that the relative outperformance of stakeholder vs. shareholder banks with Fitch ratings was due to less severe downgrades for federated cooperative banks as for the second and third phase of the crisis and also to non-federated cooperative banks for the third phase of the crisis; but also due to relatively better rating changes among public savings banks during the second phase of the crisis (although barely at 10% confidence level). It is worth noticing that non-federated cooperative banks provide the only category to record a significant outperformance over the entire period 2006-2011. Not contradicting the results we got for Fitch ratings, for Moody's, the relatively more severe downgrades for stakeholder banks during the first phase of the crisis arises from the relatively worse rating changes of public savings banks. By these more refined categorizations we can also detect a positive and statistically significant coefficient of public savings banks during the second phase of the crisis: Moody's ratings' changes were relatively less severe for government owned savings banks during 2008-2009 and this positive coefficient is almost of the same magnitude as was the negative coefficient for the first part of the crisis thus more or less cancelling each other out.

We performed some robustness checks on the results. First, we tried including a specific dummy for the so called GIIPS – countries (Greece, Iceland, Ireland, Italy, Portugal, and Spain) but it neither turned out significant nor altered the overall results and it was thus omitted from the presented results tables. Another aspect worth mentioning is that if the overall level of rating was already low for some groups of banks (e.g. the government owned savings banks with Fitch ratings), they had less room to deteriorate and this could be the reason why they were less severely downgraded. In view of that, as a second robustness check, we tried specifying regressions where the initial level of the rating was added as an additional explanatory variable but it did not change the obtained results as presented above.

**Table 5.5 Results for four ownership/organization class dummies, bank balance sheet and country controls**

FITCH					MOODY'S				
	2006-2011	2006-2008	2008-2009	2009-2011		2006-2011	2006-2008	2008-2009	2009-2011
Federated cooperatives	0.52204143	-0.07521302	0.9392449**	.79595712**	Federated cooperatives	-0.74509117	-0.45544965	-0.30497061	0.1752781
Nonfederated cooperatives	0.95708052***	0.23080232	0.75202366	.38541429*	Nonfederated cooperatives	0.49075428	0.13718447	0.32214262	-0.04264864
Private savings banks	-0.5877114	-0.17556248	-0.1263739	0.03988965	Private savings banks	-0.4683087	-0.22681394	-0.22929643	0.11963727
Public savings banks	0.23604125	0.04340818	1.0694016*	0.25015449	Public savings banks	-0.58305616	-.92648117***	.78735851***	0.11131833
Income	28.106763	32.163807	30.959231	-22.108411	Income	16.075931	19.595017	12.76264	9.0193448*
Costs	49.158623	23.438345	-25.012753	31.073569	Costs	47.367818	21.037676	-3.0367592	-26.310342*
Capital	3.9136946	2.0052852	2.2450667	2.3044652	Capital	7.4900709	-1.775546	10.449156**	-0.34550127
Size	-0.05432745	-0.02096349	-0.07952562	-0.02977984	Size	-.43175373***	-.19958179***	-.21299323***	-0.01244447
Loanloss	-180.75151***	12.266117	-23.120528	30.873416	Loanloss	-144.30805**	-76.093188**	-62.513163***	5.3718036
Loans	-4.0737581***	-2.6855148*	-1.4946401	-1.1650289*	Loans	-4.9063707***	-.71843246	-2.6793057***	-0.1439258
Net interest income	1.9858093	1.6259222	-0.73021532	0.71603555	Net interest income	2.7849693**	1.0483185	0.2163776	0.02660695
Switzerland	-0.55662283	7.3336437***	0.61051461	1.7432769**	Switzerland	5.2518878***	6.2531358***	-0.29757316	-0.08069593
France	0.28905132	7.9040142***	1.315396**	.58653574*	France	4.7312225***	6.0879402***	-0.30618854	-0.02617477
Belgium	-2.4908517***	5.7151451***	1.4109757	(omitted)	Belgium	2.8827831***	4.3146654***	-0.35597371	(omitted)
Ireland	-4.1473059***	8.1960102***	-2.0420565***	-1.5066653**	Ireland	0.51237262	5.4484314***	-3.1447642***	-0.28018003
Spain	0.72370789	8.0553381***	1.4983723**	0.19509482	Spain	3.0973686***	5.6163096***	-1.4606622***	-0.07820258
Netherlands	-0.23538222	8.2074629***	1.2958868**	0.397541	Netherlands	4.7257276***	5.8896404***	0.29526961	-.46648426*
Italy	0.3199359	7.4876732***	1.4886326**	0.37853197	Italy	4.176754***	5.4205141***	-0.07656178	-2.2144196*
UK	-0.85995895	7.5407158***	0.29895695	0.27814393	UK	2.7216171***	5.7997532***	-2.085993***	0.05835215
Finland	0.45797835	8.3147934***	1.1705018**	0.17162281	Finland	2.7446026**	5.3401197***	-1.1368936**	-0.41075858
Sweden	1.6195155***	8.6720733***	1.7439701***	.85338757**	Sweden	3.8391885***	5.9484376***	-1.3296154**	-0.03554775
Austria	(omitted)	7.8034057***	(omitted)	0.25611013	Austria	4.1260047**	6.7374201***	-1.9209426***	-0.23928156
Cyprus	2.2286365***	8.1186655***	1.7400191***	.44940248*	Cyprus	5.4409465***	7.4159493***	(omitted)	-1.1563962***
Denmark	1.1843931*	8.8826144***	1.8363602**	.41443658**	Denmark	3.2708113***	5.5896369***	-1.0157978***	-0.16569499
Greece	-1.8372039***	7.226656***	1.8880665***	-1.9368231***	Greece	3.0088113***	6.9718538***	.46702584*	-3.0316999***
Germany	-0.06157102	7.865683***	0.7586092	0.42992615	Germany	4.5220305***	6.8755629***	-0.61976249	-0.29162843
Portugal	1.1234749*	8.3564436***	1.3741584***	0.6266876	Portugal	2.9607877***	5.5496698***	-1.587124***	-0.38061655
Luxembourg	-4.1712769***	(omitted)	(omitted)	0.67571003	Luxembourg	3.2424357*	4.307978***	-0.08848139	-0.18027313
Norway	2.0523365***	9.448555***	1.8104934**	.84630149***	Norway	4.9833159***	6.4458917***	-.79602881*	-0.13984908
Constant	0.5752728	-8.6493198***	0.63002841	0.18261583	Constant	1.9227291	-3.6609332**	4.489563***	0.29573839
Number of obs #	128	134	132	109		153	160	163	129
R <sup>2</sup> adjusted	0.54533681	0.36945458	0.40824	0.54970879		0.391703	0.503858	0.554404	0.67053673

\* statistical significance \* p<.1; \*\* p<.05; \*\*\* p<.01. Income = operating income / total assets; Costs = operating costs / total assets; Capital = equity / total assets; Size = log(total assets); Loanloss = loan loss provisions / total loans; Net interest income = net interest income / total operating income. All bank specific variables lagged for their initial values

## 6. Conclusions

In this study we addressed the relative performance of European banks during the recent crisis by looking at bank individual rating changes from two of the most prominent credit rating agencies: Moody's and Fitch. We divided the crisis period into three different phases since they seem to have separately distinctive patterns and hence possibly alternative effects on financial intermediaries. The first phase is the beginning of the crisis, when it was almost entirely a financial crisis and touched mostly financial intermediaries involved in financial markets. During the second phase, the crisis poured down to real economy, affecting now also and perhaps more severely financial intermediaries where were heavily involved in retail banking. During the third phase the crisis turned again into more of a financial turmoil where the sovereign debt crisis started to spread across Europe.

In addition, we first divided our dataset of banks in two: stakeholder vs. shareholder banks to distinguish along the "mission-based" breakdown. We could hypothesize that stakeholder banks that are relatively less specialized in financial market business and more ingrained with lending activity to the non-financial sector, could be differently affected in different phases of the crisis. More specifically, we could expect that stakeholder banks be less severely hit – than shareholder banks – at least in the first and third phases, whereas the effect of the different mission is less clear for the second phase. By further refining our organizational/ownership classifications we were then able to detect which bank categories in particular were less or more severely downgraded during the crisis.

When looking at rating changes throughout the crisis, the descriptive analysis suggests that while all types of banks were affected in a roughly similar manner, some differences can be detected. For one, federated cooperative banks have come through the crisis relatively less hit by severe downgrades; also private savings banks have changed their course after the initial large decreases in their ratings. Results of our regression

analyses suggest that Fitch ratings have decreased relatively less for stakeholder banks during the second and third phases of the crisis. From our more refined categorizations we can detect that this is due to less severe downgrades for both groups of cooperative banks – the tightly-federated and the non-federated ones – during the two last phases of the crisis, as well as a relatively better performance of public savings banks during the second phase. Although these results were not confirmed by Moody's ratings per se, they were neither contradicted. With Moody's financial strength ratings, stakeholder banks relatively underperformed their shareholder counterparts but only during the first phase of the crisis. This is mainly due to Moody's more severe downgrades for public savings banks during the first phase; albeit it then upgraded them during the following phase.

Overall, the ratings by Fitch provide a statistically significant outperformance through the crisis for the stakeholder banks vis-à-vis the shareholder banks, which owes mostly to (both cooperative banks tightly- and non-federated) cooperative banks.



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## 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 bank's exposure to, appetite for, and management of risk, and thus represent the agency's view on the likelihood that it 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, which, 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 necessarily faced with a greater number of potential deficiencies of external origin.

**E:** A bank with very serious problems, which either requires or is 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, in order to avoid default. FS does 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 which are placed higher or lower in a rating category.<sup>4</sup>

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<sup>4</sup> For a full methodology on Moody's Financial strength factors, see [Moody's FS](#) and references therein.