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EARNINGS MANAGEMENT, COMPETITION AND COOPERATIVE BANKS' RISK-TAKING: INTERNATIONAL EVIDENCE*

This paper investigates the interrelationship between earnings management, competition and risk using the panel data of 615 cooperative banks in 16 countries during the 1994–2007 period. The results show that risk-earnings management and risk-competition are negatively related and the relationship is bidirectional. Also, competition-earnings management is positively related and the relationship is bidirectional. We argue that cooperative banks managers' manipulation of earnings will raise the probability of bank failure and higher market share of cooperative banks has a positive effect on their stability. Furthermore, cooperative bank managers will have less incentive to manipulate earnings if cooperative banks face less competition.

Keywords: *earnings management; competition; bank risk; cooperative bank.*
JEL classification: G21; P13.

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УПРАВЛІННЯ ЗАРОБІТНОЮ ПЛАТОЮ, КОНКУРЕНЦІЯ ТА РИЗИКИ У КООПЕРАТИВНИХ БАНКАХ: МІЖНАРОДНЕ ДОСЛІДЖЕННЯ

У статті досліджено взаємозалежність між управлінням заробітною платою, конкуренцією та ризиками на основі панельних даних по 615 кооперативних банках у 16 країнах, часовий простір дослідження – 1994–2007 роки. Результати аналізу виявили, що комбінація "ризик – управління заробітною платою" та "ризик – конкуренція" знаходяться у взаємній негативній залежності. У той же час конкуренція та управління заробітною платою демонструють взаємну позитивну кореляцію. Таким чином, маніпуляції менеджерів кооперативних банків із зарплатами підвищують імовірність банкрутства банку, водночас більша частка банку на ринку (тобто знижена конкуренція) чинить на нього стабілізуючий вплив. Відтак, у топ-менеджменту кооперативних банків не буде мотивації маніпулювати зарплатами у ситуації незначної конкуренції.

Ключові слова: *управління заробітною платою; конкуренція; банківський ризик; кооперативний банк.*
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УПРАВЛЕНИЕ ЗАРАБОТНОЙ ПЛАТОЙ, КОНКУРЕНЦИЯ И РИСКИ В КООПЕРАТИВНЫХ БАНКАХ: МЕЖДУНАРОДНОЕ ИССЛЕДОВАНИЕ

В статье исследована взаимозависимость между управлением заработной платой, конкуренцией и рисками на основе панельных данных по 615 кооперативным банкам в 16 странах, временной отрезок исследования – 1994–2007 гг. Результаты анализа показали, что комбинации "риск – управление заработной платой" и "риск – конкуренция" находятся во взаимной отрицательной зависимости. В то же время конкуренция и управление зарплатой демонстрируют взаимную положительную корреляцию. Таким образом, манипуляции менеджеров кооперативных банков с зарплатами повышают вероятность банкротства банка, в то времяб как большая доля банка на рынке (т.е. сниженная конкуренция) оказывает на него стабилизирующее действие. Из этого

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следует, что у топ-менеджмента кооперативных банков не будет мотивации манипулировать зарплатами в случае незначительной конкуренции.
Ключевые слова: *управление заработной платой; конкуренция; банковский риск; кооперативный банк.*

1. Introduction

Cooperative banks have largely escaped attention of empirical and theoretical academia, in spite of the fact that they constitute an important part of many financial systems. However, cooperative banks face rigid challenges based on their institutional set-up, they have a mutual form of ownership rather than a stock one. Mutual ownership structures generally follow a "one member – one vote" rule. Some effective mechanisms of management control disappear owing to the voting rule. Besides, most cooperative banks are set up to accumulate capital forever, creating an ever-larger intergenerational endowment that keeps on growing so long as they remain profitable. This intergenerational endowment without final owners goes beyond cooperative bank themselves, it is available for use by current members, will grow further and pass to the next generation of members. This specific feature of ownerless intergenerational endowment also creates particular governance challenges.

If corporate governance mechanisms frustrate, managers have the temptation to engage in empire-building, a tendency that is subject for many studies. They may venture into business they are unfamiliar with. Also, managers may seek appropriation of (part of) cooperative's intergenerational endowment. This temptation can lead to cooperative bank managers diverting all or some of the welfare from members through increase perquisites or retained profits. These results imply that managers may become entrenched and pursue their own interests rather than the interest of members as a group through earnings manipulation. If cooperative banks pursue objectives beyond profit maximization, it results in lower earnings, its balance sheet risks increasing over its capital and solvency exacerbation is anticipated.

Our study is to investigate the interrelationship between earnings management, competition and risk by using the panel data on 615 cooperative banks in 16 countries during the period 1994–2007. A recently developed econometric technique known as a panel Granger non-causality test developed by Hurlin has been empirically tested in the literature (e.g., Tom et al., 2010; Yabei Hu, Shigeni Izumida, 2008; Takero Doi, 2010; Miguel Gomez-Antonio and Ana Angulo Garijo, 2000; Xuemei Bai et al., 2012; Pravakar Sahoo and Ranjan Kunar Dash, 2012). Therefore, this study examines the causal relationship between the variables by applying the test proposed by Hurlin.

The paper proceeds as follows. Section 2 provides the literature review. Section 3 presents the methodology. Section 4 describes the data sources and the key variables under investigation and discusses the results. Section 5 summarizes the findings.

2. Literature review

Studies on the relationships between earnings management, competition and risk can be divided into 3 categories: those which look at the relationship between earnings management and risk, those which deal with the relationship between competition and risk, and those which explore the relationship between earnings management and competition.

Under the first group we consider the studies of Shen and Chih (2005), Adams et al. (2009), and Cornett et al. (2009). Shen and Chih examine the accounting data consisting of the panel of 47,154 banks for 48 countries covering the period from 1994 till 1998. By using TSCS regression analysis, they find that bank managers in two-thirds of the countries tend to misrepresent the reported earnings to investors by controlling the discretionary accruals. Adams et al. work with accounting data for mutual thrifts for 1992–2003. By using the two-stage regression analysis, they find that managers of demutualizing firm use the incentives to reduce earnings before raising capital at public markets. This study provides valuable information for investors and regulators to closely check accounting statements prior to an IPO. Cornett et al. examine the accounting data for 100 largest US bank holding companies during 1994–2002. By using the two-stage least squares regressions, they find that CEO pay-for-performance sensitivity is positively related to earnings management. Similar results in the first group are stressed by Burgstahler and Dichev (1997), Peltier-Rivest (1999), Jaggi and Lee (2002), Yasuda et al. (2004), Cheng and Nasir (2008), Koziol and Lawrenz (2009), Ismail and Choi (1996).

In the second group we consider the studies of Barth et al. (2009), Agoraki et al. (2011) and Berger et al. (2009). Barth et al. investigate the relationship between bank competition, information sharing and lending corruption. By using 3 different data sets, they argue that competition intensification in banking helps decrease lending corruption. Besides, information sharing through credit registries and bureaus helps reduce lending corruption. Agoraki et al. detect the relationship between bank risk, market power, and regulations using the panel data regression analysis containing accounting data for 546 banks operating in 13 Central and Eastern European countries. They argue that banks with higher market power tend to have a lower probability of insolvency. Berger et al. (2009) investigate the relationship between bank risk and competition by using the generalized method of moments regression working with the accounting data from BankScope database for 8,235 banks in 23 industrialized countries covering the period 1999–2005. They argue that banks with higher market power may result in lower bank risks. Similar results in the second group are provided by Hellmann et al. (2000), Matutes and Vives (2000), De Nicole and Loukoianova (2007), Boyd et al. (2007), Craig and Dinger (2009), and Zhao et al. (2010).

In the third group we consider the studies of Hagerman and Zmijewski (1979, 1981) and Harris (1998). Hagerman and Zmijewski examine the interrelationship between size, capital intensive, concentration ratio, benefit package, and accounting manipulation using probit analysis containing the financial data on 300 accounting manipulation companies. They argue that larger companies with high concentration ratio have an incentive to manipulate earnings. Harris detects the relationship between industry competition and financial disclosure using logit analysis containing accounting data for 929 companies for 1987–1991. He argues that companies with lower market competition will handicap the financial disclosure.

While previous studies almost focus on banks or companies, this study adds to the literature by studying the interrelationship between earnings management, competition and risk using cooperative banks data. It attempts to contribute to the line of research employing panel Granger non-causality test to detect the causal relation between variables.

3. Methodology

To examine the relationship between variables, researchers usually use the concept of Granger causality. For instance, x causes y in the Granger cause if lagged x helps to forecast y. Even though Granger causality tests for times series data have been well developed, a better way of testing for causality is the introduction of panel data dimension. It apparently improves the power of traditional causality test.

However, one of the material stakes of panel data is to specify the heterogeneity between individuals. More generally, in a k order linear vector autoregressive model, Hurlin defines 4 kinds of causal relationships. The first, denoted as homogeneous non-causality (HNC) hypothesis, implies there does not exist any individual causality relationship from x to y. The symmetric case is homogeneous causality (HC), which occurs when there are N causality relationships. The last two cases correspond to heterogeneous process. Under the heterogeneous causality (HEC) hypothesis, Hurlin assumes there are N causality relationships as in the HC case, but the dynamics of y is heterogeneous. The heterogeneity does not affect the causality result. Finally, under the heterogeneous non-causality (HENC) hypothesis, Hurlin assumes there is a subgroup of individuals for which there is a causal relationship from x to y. Symmetrically, there is at least one and at the most $N-1$ non-causal relationships in the model. Therefore, the true causal relationship may be misinterpreted due to the ignorance of heterogeneity between individuals (Hurlin, 2008).

The pioneering work on panel Granger causality test belongs to Holtz-Eakin et al. (1988). For each individual i ($i = 1,2,\ldots,N$) at each time ($t = 1,2,\ldots,T$) consider the following linear model:

$$y_{it} = \alpha_i + \sum_{k=1}^{k} \gamma^{(k)} y_{it-k} + \sum_{k=1}^{k} \beta^{(k)} x_{it-k} + \varepsilon_{it}, \quad (1)$$

where α_i captures the individual specific effect across i and the coefficients $\gamma^{(k)}$ and $\beta^{(k)}$ are assumed to be constant for all i. In this model, Holtz-Eakin et al. test the null hypothesis of the homogeneous non-causality (HNC) against the homogeneous causality (HC) hypothesis. However, this approach may cause several problems. First, Nickell (1981) argued that the estimators, $\gamma^{(k)}$ and $\beta^{(k)}$, from the panel Granger non-causality test are biased and inconsistent in the dynamic panel data model when there are many cross-sectional units observed over relatively short time periods. Intuitively, the estimate β obtained from an homogeneous model will converge to a value close to the average of the true coefficient β_i, even if that means a value of zero. It is likely to lead us to accept at wrong the no-causality hypothesis. Second, the Wald-type statistics does not converge in distribution to a standard normal if T is small (Hurlin, 2008). Third, it is clear that the homogeneous hypothesis is very restrictive, since it particularly implies that causality does not exist for any individual. If there is a significant relation between y and past value of x_t for only an individual of the panel, this test leads to conclude to the global causality hypothesis for the whole sample. To conquer the abovementioned drawbacks, Hurlin propose a test for the homogeneous non-causality (HNC) hypothesis. However, Hurlin does not test this hypothesis against the HC hypothesis as Holtz-Eakin et al., he specifies the alternative as the HENC hypothesis. HENC allows some but not all of the individuals to Granger cause from x to y. Consider the following linear model:

$$y_{it} = \alpha_i + \sum_{k=1}^{k} \gamma_i^{(k)} y_{it-k} + \sum_{k=1}^{k} \beta_i^{(k)} x_{it-k} + \varepsilon_{it} \quad (2)$$

Hurlin assumes that lag orders k are identical for all cross-section units of the panel and the panel is balanced. He allows for autoregressive parameters $\gamma_i^{(k)}$ and regression coefficients slopes $\beta_i^{(k)}$ to differ across groups. The idea behind Hurlin is to average the individual Wald-statistics associated with the test of the non causality hypothesis for units $i = 1, 2,\ldots,N$. In this study, we use Hurlin's method to conduct the panel Granger non-causality test.

4. Empirical results

4.1 Data. Our major variables are Z-score as a measure of bank risk, discretionary accruals for earnings management measure and H-statistics as a variable for bank competition measure. 3 major variables calculations are based on individual cooperative banks data drawn from the BankScope database. Searching the BankScope database yields the total of 3,084 individual cooperative banks from 1994 to 2007 in 29 countries. When we detect discretionary accruals, the predicted sign of the parameters obtained by using the OLS must be met (see Bartov et al., 2001)[4]. If this requirement is violated, we discard them from our sample. This selection rule produces the final balanced panel of 615 cooperative banks in 16 countries covering the period of 14 years, from 1994 till 2007.

Besides, we divide the total number of countries into G-7 and Non G-7. The reason for this is the causal relationship between the variables under consideration may be sensitive to different categories. All results are summarized in Table 1.

Table 1. **Panel regression analysis**

	Estimates of α_i	Estimates of β_{1i}, predicted sign: +	Estimates of β_{2i}, predicted sign: -	N. of observations
US	0.201345	0.000429	-0.032879	2
Canada	0.110953	0.00000186	-0.0000579	10
Japan	22465.53	0.000432	-0.045736	8
Germany	305.3402	0.116604	-0.012431	412
France	-165.1032	0.014532	-0.123179	44
Italy	0.240138	0.023421	-0.132454	74
UK	0.152041	0.105243	-0.32547	1
Spain	0.120842	0.000014	-0.0000642	30
Austria	2451.270	0.000640	-0.347710	19
Mexico	0.210934	0.000531	-0.035245	2
Gzech Republic	0.130425	0.0000153	-0.0000478	1
New Zealand	0.108432	0.000528	-0.325510	2
Poland	154.3201	0.124314	-0.02475	1
Turkey	0.201475	0.000632	-0.325871	2
Australia	2345.21	0.000782	-0.024376	5
Greece	0.213724	0.001574	-0.342357	2
G-7	270.8745	0.056999	-0.00041	550
Non G-7	81.2458	0.011398	-0.000082	64
Total	280.2568	0.036306	-0.001539	615

Source: Authors' estimates on the BankScope data.

4.2. Variables description. *Bank risk.* A number of studies use Z-score as a measure of bank soundness, which has become popular among academicians in measur-

[4] The criteria of detecting discretional accruals will be discussed in the next section.

ing the probability of a bank's insolvency in recent years. Let A represents assets, E represents equity capital, $k = E / A$ represents the equity-to-asset ratio, π represents after-tax net income, $\pi = \pi / A$ represents returns on assets (ROA), σ is the standard deviation of the ROA, the Z-score can be calculated as $Z = (\pi + k) / \sigma$.

We calculate the Z-score of individual cooperative bank based on BankScope database. A larger Z-score implies higher bank stability and less bank risk.

Discretionary accruals. Accruals represent an accounting adjustment in response to changes in economic circumstances. They contain a discretionary portion and a non-discretionary portion, the former is manipulated at the discretion of management. The latter is conducted by business conditions. A detection of earnings management most focuses on manager's use of discretionary accruals. Existing models range from simple models to more sophisticated models.

Dechow et al. (1995) evaluated the relative performance of earning management models, they argue that the modified Jones model is the most robust one for earning management detection. Therefore, the modified Jones model is adopted in our study.

The modified Jones model for nondiscretionary accruals is

$$\mathrm{NDA_{it}} = \overline{\alpha_i}\left(\frac{1}{A_{it-1}}\right) + \overline{\beta_{1i}}\left(\frac{\Delta REV_{it} - \Delta REC_{it}}{A_{it-1}}\right) + \overline{\beta_{2i}}\left(\frac{PPE_{it}}{A_{it-1}}\right) \quad (3)$$

where NDA_{it} is the nondiscretionary accruals for bank i and time t deflated by lagged total assets, ΔREV_{it} is change in revenues in time t, ΔREC_{it} is the change in net receivable in time t, PPE_{it} is gross property and plant and equipment in time t, and α_i, β_{1i} and β_{2i}, however, instead of obtaining from the modified Jones model, are estimated from the original Jones model. The Jones model for total accruals deflated by lagged total assets is

$$\frac{\mathrm{TA}_{it}}{\mathrm{A}_{it-1}} = \alpha_{\mathrm{i}}\left(\frac{1}{\mathrm{A}_{it-1}}\right) + \beta_{1\mathrm{i}}\left(\frac{\Delta \mathrm{REV_{it}}}{\mathrm{A}_{it-1}}\right) + \beta_{2\mathrm{i}}\left(\frac{PPE_{\mathrm{it}}}{\mathrm{A}_{it-1}}\right) + \varepsilon_{\mathrm{it}}. \quad (4)$$

When we estimate discretionary accruals, the predicted sign of parameters (i.e. $\beta_{1i} > 0$, $\beta_{1i} < 0$) obtained from equation (4) must be met (see Bartov et al., 2001). ε_{it} is the error term, which represents the discretionary accruals.

Academic literature provides support that cooperative managers may inflate reported earnings through earnings manipulation in order to provide a rosy picture of unfavorable information about cooperative's financial health, particularly, at the time of distress. Hence, a negative association between z-score and earnings management is anticipated.

Competition. We use the H-statistics as a measure of bank competition in our study. The H-statistics is developed by Panzar and Rosse (1987), and is defined as the sum of the elasticity of total revenue with respect to input prices. A perfect competition is characterized by the value of the H-statistics equal to 1 ($H = 1$). Negative values of the H-statistic ($H < 0$) are consistent with a monopoly. The H-statistic calculations follow the method developed by Claessens and Laeven (2004).

4.3. Panel unit root test. There are various types of panel unit root tests, for example, Levin et al. (LLC, 2002), Im et al. (IPS, 2003), Maddala and Wu (MW, 1999), and Choi (Choi, 2001). Our results indicate that LLC, IPS, MW and Choi tests reject the null hypothesis that a unit root exists for Z-score, the logarithm of Z-score, and

discretionary accruals. However, the LLC, IPS and MW tests strongly show that the competition variable (H-statistics) is non-stationary[5]. Thus, we adjust the competition variable by taking the first difference. The results show that the first-difference transformation will remove the potential non-stationarity[6].

Once the stationarity of the variable has been validated using panel unit root tests, Hurlin's test is implemented by considering two different scenarios. One is to neglect the non-stationarity of the competition variable, and the other is to use the first-difference of the competition variable.

4.4. Panel Granger non-causality tests. To implement Hurlin's test, the criteria, $T_i > 5 + 2k$ (T_i: time spans for country i), must be met. The T_i in our study is 14, the possible selection of the autoregressive lag orders (k) is 1, 2, 3 and 4. For example, if $k = 3$, we would need at least 12 consecutive observations ($T_i = 12$) for country i. It is likely to exhaust degrees of freedom with relatively short panels according to Hurlin. We therefore choose $k = 2$[7] in our study and test the Granger non-causality among variables. This enables us to conduct 16 combinations of the panel Granger non-causality tests.

We first omit the non-stationarity of the competition variable. Table 2 summarizes the results. We find that the relationship between risk and competition is bidirectional. The same results are also found between discretional accruals and competition. Due to the results are obtained by omitting the non-stationarity of the competition variable, it may not a reliable result.

Table 2. Panel Granger non-causality tests (omit the non-stationarity of the competition variable), *authors calculations*

ZS → HS	LZS → HS	HS → ZS	HS → LZS	HS → DA	DA → HS
2.556398***	1.724661*	4.222545***	5.43652***	4.370218***	5.242879***
(0.0000)	(0.0821)	(0.0012)	(0.0000)	(0.0000)	(0.0000)
[4.1784]	[0.1017]	[-3.1997]	[-4.8247]	[4.4381]	[0.0498]

1."→" denote the panel Granger homogenous non-causality (HNC) null hypothesis. 2. p-values are in (). 3. ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively. 4. Regression coefficients $\hat{a}_2^{(k)}$ from equation (2) are in []. 5. ZS, LZS, DA and HS denote Z-score, the logarithm of ZS, Discretional Accruals and H-statistic. 6. A logarithmic transformation is excluded from DA due to the characteristic of DA.

We then take the possible non-stationarity under consideration by first-differencing HS. Table 3 summarizes the results. We find that risk (Z-score) and discretionary accruals are negatively related and the relationship is bidirectional, indicating that cooperative banks managers may inflate reported earnings through earnings manipulation particularly at the time of distress thus leading to an increase in bankruptcy probability. We also find that risk (Z-score) and competition are negatively related and the relationship is bidirectional, implying that a higher market share of cooperative banks has a positive effect on cooperative banks' stability. Furthermore, discretional accruals and competition are positively related and the relationship is bidirectional, implying that cooperative banks managers will have less incentive to manipulate earnings if Cooperatives Banks face less competition.

[5] The logarithm of H-statistics is also non-stationary by employing panel unit root tests.

[6] Detail results are not shown in the paper due to size restrictions.

[7] We also conduct panel Granger non-causality tests by choosing k = 1. The results are much the same as for k = 2. Detail results are not shown in the paper, but are available on request from the authors.

Table 3. **Panel Granger non-causality tests (correct the potential non-stationarity of the competition variable),** *authors calculations*

ZS → DA	LZS → DA	DA → ZS	DA → LZS	ZS → ÄHS
2.785816***	2.470240***	1.597912*	1.702231*	2.941674***
(0.0023)	(0.0000)	(0.0723)	(0.0902)	(0.0000)
[-0.057]	[-2.2979]	[-1.3007]	[-0.0149]	[4.130551]
LZS → ÄHS	ÄHS → ZS	ÄHS → LZS	DA → ÄHS	ÄHS → DA
2.767603***	2.157362**	1.68316*	1.790305*	2.124612**
(0.0092)	(0.0325)	(0.0724)	(0.0722)	(0.0325)
[-0.4493]	[-1.2634]	[-2.4687]	[3.4156]	[3.2606]

ΔHS denotes the first differenced HS.

In order to conduct the robustness of our results, we construct the scenario by dividing the total countries into G-7 and non G-7, we have 551 G-7 and 64 non G-7 after the countries and separated. The results by using the level in HS are reported in Table 4, much the same as Table 2. Again, the results are doubtful since the non-stationarity of the competition variable.

Table 4. **Panel Granger non-causality tests (G-7 and non G-7),** *authors calculations*

	ZS → HS	LZS → HS	HS → ZS	HS → LZS	HS → DA	DA → HS
G-7	1.512218*	1.712519*	3.424954***	4.798045***	5.971389***	1.950676*
	(0.0715)	(0.06203)	(0.0000)	(0.0000)	(0.0042)	(0.0924)
	[-3.4921]	[-0.0726]	[-0.2048]	[-2.3625]	[1.4167]	[-0.00064]
Non G-7	5.758171***	0.396558	3.878599***	0.564420	1.952193*	2.357397**
	(0.0000)	(0.1425)	(0.0002)	(0.1264)	(0.0000)	(0.0325)
	[-3.0675]	[-0.1015]	[-2.0955]	[3.6332]	[3.1447]	[0.00053]

Footnotes: Same as in Table 2.

The results by using the first-differenced HS are reported in Table 5. Again, Table 5 tells similar stories as Table 3 that we found for all the countries as a whole, regardless how countries are classified.

Table 5. **Panel Granger non-causality tests with correcting for potential non-stationarity (G-7 and non G-7),** *authors calculations*

	ZS → DA	LZS → DA	DA → ZS	DA → LZS	ZS → ÄHS
G-7	2.777789***	1.294706	2.875013***	2.906114***	0.443513
	(0.0084)	(0.2418)	(0.0000)	(0.0002)	(0.1423)
	[-1.2629]	[-0.983]	[-2.8697]	[-0.0203]	[-1.7582]
Non G-7	2.763340***	2.636077***	1.031937	2.974543***	0.547123
	(0.0088)	(0.0000)	(0.1425)	(0.0001)	(0.2315)
	[-2.174]	[-0.6741]	[-2.7389]	[-0.0176]	[-2.1139]
	LZS → ÄHS	ÄHS → ZS	ÄHS → LZS	DA → ÄHS	ÄHS → DA
G-7	2.357862**	2.314793**	2.011552*	2.121705*	2.381705**
	(0.0325)	(0.0302)	(0.0621)	(0.0762)	(0.0486)
	[-0.4410]	[-2.3784]	[-1.8966]	[0.0021]	[2.1343]
Non G-7	1.772132*	1.039892	2.621826***	1.923211*	2.647567 0***
	(0.0725)	(0.1741)	(0.0000)	(0.0625)	(0.0000)
	[-0.4533]	[-2.0044]	[-2.9186]	[0.0369]	[2.6107]

Footnotes: Same as in Table 3.

In addition to the robustness tests, we conduct the sensitivity detection by considering 3 different time periods, 1994–2005, 1994–2006 and 1994–2007, to implement the Granger non-causality test. Note that the time periods of 1994–2005 and 1994–2008 denote discarding two years and one year in terms of data point for each country from the original data period (1994–2007), respectively. Most of Granger

non-causality tests provide evidence of bidirectional causality among risk, earning management and competition. For example, the 3 test statistics for testing the null hypothesis that DA does not Granger cause ZS are 2.2483 (1994–2005), 2.0524 (1994–2006) and 1.597912 (1994–2007)[8]. This result is in accordance with our former analysis.

5. Conclusions

In this study, we investigated the interrelationship between earnings management, competition and risk using the Granger non-causality test containing a balanced panel data on 615 cooperative banks in 16 countries during the 1994–2007 period. The results show that risk-earning management and risk-competition are negatively related and the relationship is bidirectional, indicating that cooperative bank mangers' manipulation of earnings will raise the probability of bank failure. Also, a higher market share of cooperative banks has a positive effect on their stability. We also found earnings management and competition positively related, their relationship being bidirectional, implying that bank managers will have less incentive to manipulate earnings if cooperative banks face less competition. Furthermore, grouping the data into G-7 and non G-7 leads to the similar results as we found for all the countries as a whole. The sensitivity analysis shows that our results are robust, since discarding one or two data points does not change the results.

In order to reduce the risk of managers engaging in empire-building, it should be possible to design suitable governance mechanisms considered crucial for the success of cooperative banks. For instance, substitute the current mutual form of ownership with a stock one, transparency, clear definition of responsibilities and lines of accountability, and adequate representation of stakeholders. These issues remain to be explored in our future research. As for competition, cooperative banks typically have strong retail market positions. In order to keep the superiority of retail orientation, it should be possible to engage networks integration on cooperative banks, forming networks allows the pursuit of economies of scale and scope, and the provision of a safety net or mutual support mechanism. However, a new challenge for stability due to more complex structure is possible. This also might be explored in our future research.

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[8] Space limitation precludes the discussion of these issues here. Detailed results are available on request from the authors.

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