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# Investor protection, prospect theory, and earnings management: An international comparison of the banking industry

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**Abstract**

This paper raises three issues related to the *earnings* management (EM) of banks across 48 countries. First, does *earnings* management of banks exist in all 48 countries? Second, what is the incentive of banks to manage earnings? Third, why does EM vary across countries? To answer these three questions, two thresholds (viz., a threshold of *zero earnings* and a threshold of *zero earnings change*) are employed.

The answer to the first question above is that banks in more than two-thirds of the 48 countries sampled are found to have managed their earnings. With respect to the second question, prospect theory is used to provide an answer. The relationship between return and risk is positive for high earnings groups, but is negative for low earnings banks. Finally, as to the last question, stronger protection of investors and greater transparency in accounting disclosure can reduce banks' incentives to manage earnings. Also, higher real GDP per capita decreases the degree of earnings management. It is seen that stronger enforcement of laws can counter intuitively result in stronger earnings management. However, this effect appears in low-income countries only, and not in high-income countries.


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## 1. Introduction

Recent allegations of accounting fraud at Enron, followed by similar allegations at WorldCom, Xerox, Royal Ahold, HealthSouth, and so on, have triggered a closer examination of the topic of earnings management. Schipper (1989) and Healy and Wahlen (1999) state that earnings management is the alteration of firms' reported economic performance by insiders to either "mislead some stakeholders" or to "influence contractual outcomes". For instance, insiders can use their discretion in financial reporting to overstate the true level of earnings and hide unfavorable earnings realizations (e.g., earnings losses or earnings decreases) that would prompt outsiders to take action against insiders. In the presence of extensive earnings management, financial reports inaccurately reflect firm performance and consequently weaken outsiders' ability to govern the firm (Leuz et al., 2003).

To inferentially measure the extent of earnings management, Degeorge et al. (1999) and Burgstahler and Dichev (1997) present evidence that managers of US firms use accounting discretion to avoid reporting small losses. Employing annual earnings (scaled by beginning market value) on US firms for the years 1976–1994, Burgstahler and Dichev (1997) demonstrate a relatively smoothed single-peaked, bell-shaped distribution except in the area of zero earnings. Their graph of "drop-at-zero" is reproduced in panel A of Fig. 1 where earnings slightly less than zero occur much less frequently than would be expected given the smoothness of the remainder of the distribution, and earnings slightly greater than zero occur much more frequently than would be expected. The evidence suggests that firms manage reported earnings so as to avoid losses in earnings when losses are small. Namely, while non-financial firms can hide small losses, they cannot hide big losses. Burgstahler and Dichev (1997) also find that managers of US firms use accounting discretion to avoid reporting small earnings decreases. Degeorge et al. (1999), using statistical earnings management measures, also find evidence of earnings management that exceeds each of three "thresholds": reported positive profits, sustained recent performance, and the meeting of analysts' expectations.

While the above studies provide convincing evidence of earnings management, their samples typically exclude financial institutions and firms in other regulated industries, such as the utility industry. As to Burgstahler and Dichev's (1997) viewpoint, for regulated firms, conflicting incentives to report lower earnings or decreases in earnings arise whenever there are economic benefits from reporting lower earnings to regulators; for financial institutions, incentives to avoid earnings decreases or losses may be (negatively) linked to (the extent of) regulatory oversight. While the

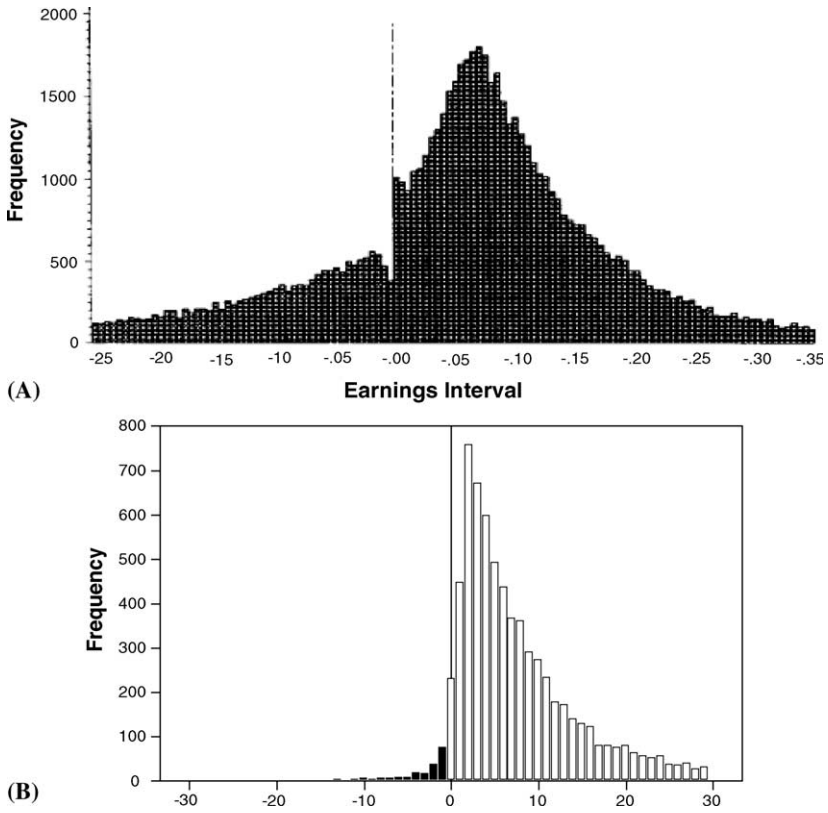


Fig. 1. The distribution of earnings of US non-financial and financial industries. (A) *Non-financial industries*. Earnings: Annual net income scaled by market values at the beginning of the year. (Graphs are taken from Burgstahler and Dichev, 1997.) (B) *Financial institutions*. Earnings: Annual net income scaled by year-end common equity for US banks for the sample period from 1993 to 1999.

banking industry also falls into this category, it often plays a crucial role in the capital market; for example, banks' market capitalization ratios in the capital market are typically large. Aside from this, there are three more reasons why banks have special incentives to manage earnings, relative to the general industry, and thus it is worthwhile to test if earnings management exists in the banking industry. [2]

First, a banking system faces a potential illiquidity problem and thus is exposed to the risk of widespread bank runs, i.e., not all banking system obligations can be met if all holders of those obligations simultaneously claim what they have been promised (Diamond and Dybvig, 1983). Morgan (2002) says that: "... banks are black boxes, and the risks taken in the process of intermediation are hard to observe from

[2] The extent to which banks manage their earnings is of much interest both to academics and to the public (Liu et al., 1997; Koch and Wall, 1999; Anandarajan et al., 2000).

outside the bank. Therefore, the opacity of banks exposes the entire financial system to bank runs, contagion, and other strains of 'systemic' risk.'' Thus, in order to keep depositors from losing confidence in banks, banks have a strong incentive to prevent their earnings from being negative.

Second, Morgan (2002) also says that: ''... uncertainty over the banks stems from their assets, loans and trading assets in particular, the risks of which are hard to observe or easy to change. Banks' high leverage compounds the uncertainty over their assets; their assets present bankers with ample opportunities for risk or asset substitution, and their high leverage inclines them to do so.'' Therefore, bank insiders have a high incentive to hide asset substitution behavior through earnings management.

Lastly, banks are highly regulated firms, whose non-performing loan ratio, capital adequacy ratio, liquidity ratio, etc. are strictly regulated. Thus, earnings management is one of the management skills that banks adopt to avoid violating regulations. [3]

An example, taken from Wall and Koch (2000), is provided to see why bank earnings management is the concern of researchers, regulators and market. There was once a heated debate about the use of allowance for loan loss (ALL) to conduct earnings management in the US. In the fall of 1998, the Securities and Exchange Commission (SEC) of the USA was questioning the *overstated* loan-loss allowance of SunTrust Bank to conduct earnings management. Thus, investors had no correct information about the bank's earnings and capital adequacy. The stock price of the bank was thus distorted. Bank regulators, instead, had the opposite concern. They preferred banks to have high loan-loss allowance to absorb more unexpected losses without imposing losses on the Federal Deposit Insurance Corporation (FDIC). Some bank analysts criticized the SEC's action by arguing that SunTrust Bank's earnings stability was a function of a conservative credit culture. Banks themselves are worried that they might be caught in a conflict between the SEC and bank regulators. Finally, to provide banks with some guidance about appropriate reserves, the SEC and bank regulators issued joint letters to stress that banks should have prudent, conservative, but not excessive, loan loss allowances that fall within an acceptable range of estimated losses. Hence, banks' earnings management is the concern of the SEC, bank regulators and banking organizations.

The aim of this paper is to study EM and the related issues of banks across 48 countries. We explore the following three questions. First, is bank earnings management a global phenomenon? We answer this question by first providing graphical evidence similar to Burgstahler and Dichev (1997) and Degeorge et al. (1999). We then use four measures of EM to evaluate the degree of earnings management. We find that bank earnings management indeed does exist in our sample countries.

Our next question is related to the incentives of banks to manage earnings. Prospect theory, from Kahneman and Tversky (1979), is raised to account for this behav-

[3] Banks often adopt to some extent four policies to fulfill the requirements of regulation; namely, capital management, earnings management, loan loss provision, and subordinated bond issuance.

ior (Burgstahler and Dichev, 1997; Degeorge et al., 1999). The theory suggests that individuals derive values from gains and losses with respect to a reference point, rather than being from absolute levels of wealth. It also suggests that individuals' value functions are concave in gains and convex in losses (S-shape). Thus, for a given increase in wealth, the increase in value is greatest when the wealth of the individual increases from a loss to a gain relative to a reference point. If the preferences of the stakeholders are consistent with the prospect theory, then the manager has an incentive to report earnings that exceed the threshold, or the reference point, such as zero earnings levels or zero earnings changes, to obtain more rewards.

Although Burgstahler and Dichev (1997) and Degeorge et al. (1999) theoretically infer that prospect theory is a possible motivation for EM, they do not test it directly. In fact, the S-shape prospect theory suggests that the decision maker will be risk-averse above the reference point and risk-seeking below it, which implies that the relationship between the risk and return is positive above the reference point and negative below it. Employing 85 US industries, Fiegenbaum (1990) finds that asymmetric risk-return association indeed exists, i.e., firms below the industry target are risk-lovers while those above it are risk-averters. Similar to the above notion, this paper also investigates whether or not an asymmetric risk-return association between banks exists, by using banks' earnings threshold as the reference point. If an asymmetric relation is found, then the prospect theory may be empirically proved as an explanation for earnings management.

The third and last question asks how the degree of EM varies across countries, if EM exists. While most banks do engage in earnings management, the degree of management is not the same. It is interesting to investigate reasons behind the wide variations of EM across countries. Leuz et al. (2003) explore a similar issue. They highlight the role of laws and enforcement as important determinants of earnings management, but focused only on non-financial industries across 31 countries. They suggest two competing hypotheses, diversion and penalty hypotheses, to account for the variations. The diversion hypothesis claims that an insider plans to manage earnings so that he can divert a firm's resources to himself, such as excessive compensation to managers, perquisite consumption, and so on. A good set of laws and strong enforcement may mitigate diversion activities, but they also lessen insiders' incentive to manage earnings due to the fact that the insider has less to hide from outsiders. As a result, the incentive to manage earnings *decreases* in a strong legal protection environment. The penalty hypothesis alternatively argues that a strong legal environment encourages earnings management, because negative earnings incur an authority's penalty. The insider thus has a greater incentive to hide a profit loss when faced with greater expected penalties. Therefore, earnings management *increases* with a strengthening of a country's legal protection.

Leuz et al. (2003) find that the legal protection of outside investors – including "antidirector rights", "quality of legal enforcement", and "accounting disclosure", which are all extracted from La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998; LLSV hereafter) – is indeed a key determinant of the quality of financial information communicated by insiders to outsiders. They find that earnings management *decreases* in stronger legal protection countries. Therefore, the penalty effect

is dominated by the diversion effect. Again, since financial institutions are ignored in Leuz et al. (2003), it's worthwhile to test if earnings management also *decreases* in the banking industry.

Following Leuz et al. (2003), we employ "accounting disclosure" as another factor to explain the variation in the extent of managed earnings across countries, since stringent accounting standards can affect the reliability of financial reports and thus lower the degree of managed earnings. In addition, we introduce an "insider trading" index to explain variations in the extent of managed earnings across countries, since insiders have higher incentives to manage earnings when it's easy to acquire benefits from insider trading.

The paper proceeds as follows. In addition to the first section, the next section shows the earnings histogram of banks in the US and 47 other countries. We then use three earnings management measures to examine the null hypothesis of no bank earnings management across the 48 countries. Section 3 tests whether the prospect theory can be a motivation for banks to manage earnings so as to exceed thresholds. Section 4 tests whether outside investor protection can explain the variation in the earnings management measures across our sample countries. Section 5 provides the conclusion.

## 2. Do banks manage earnings to exceed thresholds?

### 2.1. The graphical evidence

In contrast to panel A of Fig. 1, which plots the histogram of the annual earnings of US non-financial firms, panel B of the same figure shows the earnings histogram of US financial institutions. The earnings are scaled by common equity. The samples are US banks covering the period from 1993 to 1999, where the data source is the *Bankscope* of Fitch IBCA. In sharp contrast to panel A of Fig. 1, the histogram of bank earnings turns dramatically into a half-normal distribution. That is, earnings less than zero occur much less frequently than would be expected given the smoothness of the remainder of the distribution. Therefore, the incentive to manage earnings is different between US banks and non-financial industries. We wonder whether this half bell-shaped distribution of earnings is common globally.

Fig. 2 demonstrates the respective banks' earnings distribution of 48 countries from 1993 to 1999, and the data are also obtained from the *Bankscope* database. The sample consists of 70,955 observations for the fiscal years 1993–1999 across 48 countries and 47,154 banks. Two conclusions can be drawn from this figure. First, more than two-thirds of the countries exhibit this half bell-shaped distribution. Thus, the earnings distribution is indeed different from non-financial industries. Second, even for those that do not exhibit this half-normal distribution, the left hand of the distribution is decidedly "shrunken". This constitutes an important stylized fact and motivates us to investigate whether or not banks engage in earnings management.

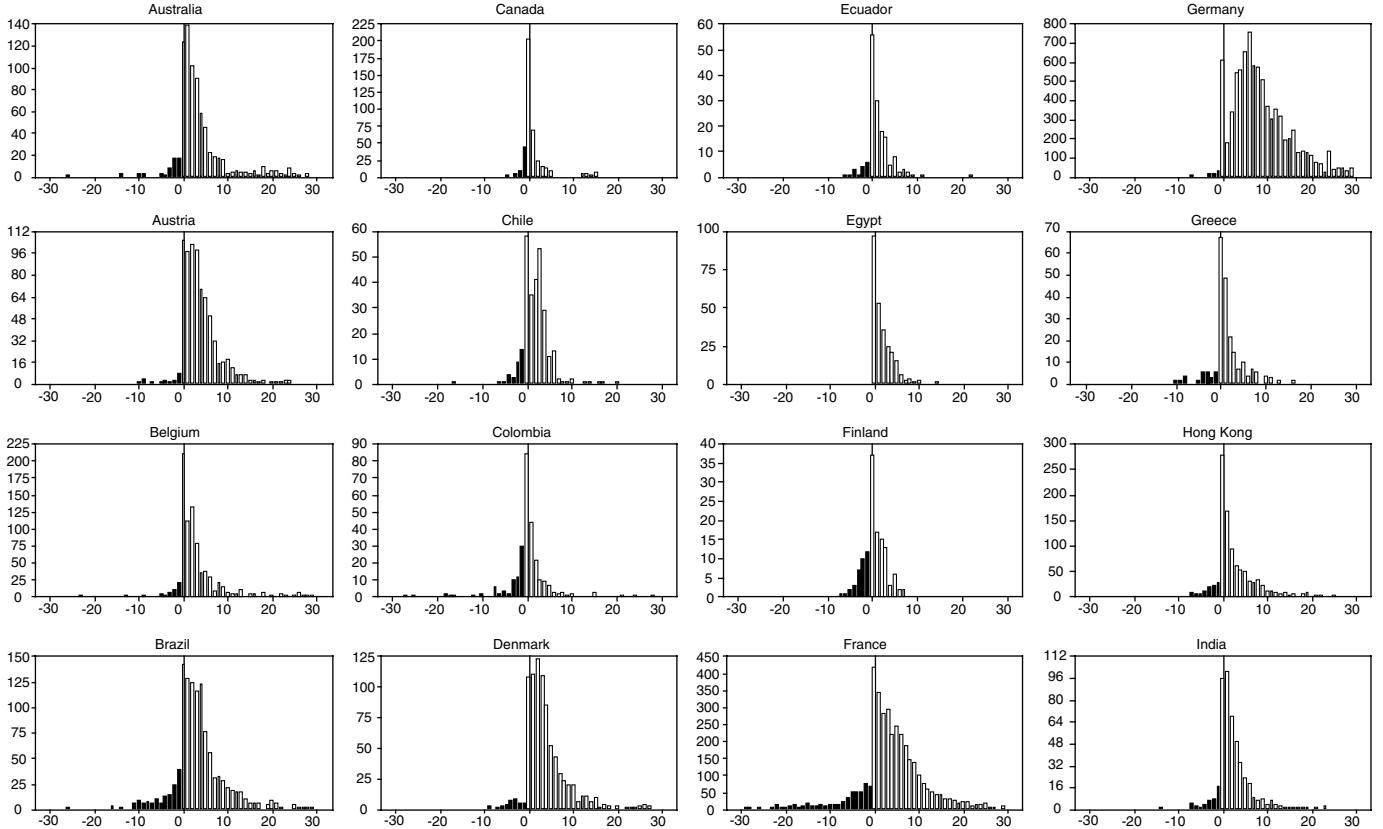


Fig. 2. Distribution of annual net income across 48 countries. This annual net income is scaled by year-end common equity of the commercial banks. The sample period is from 1993 to 1999.

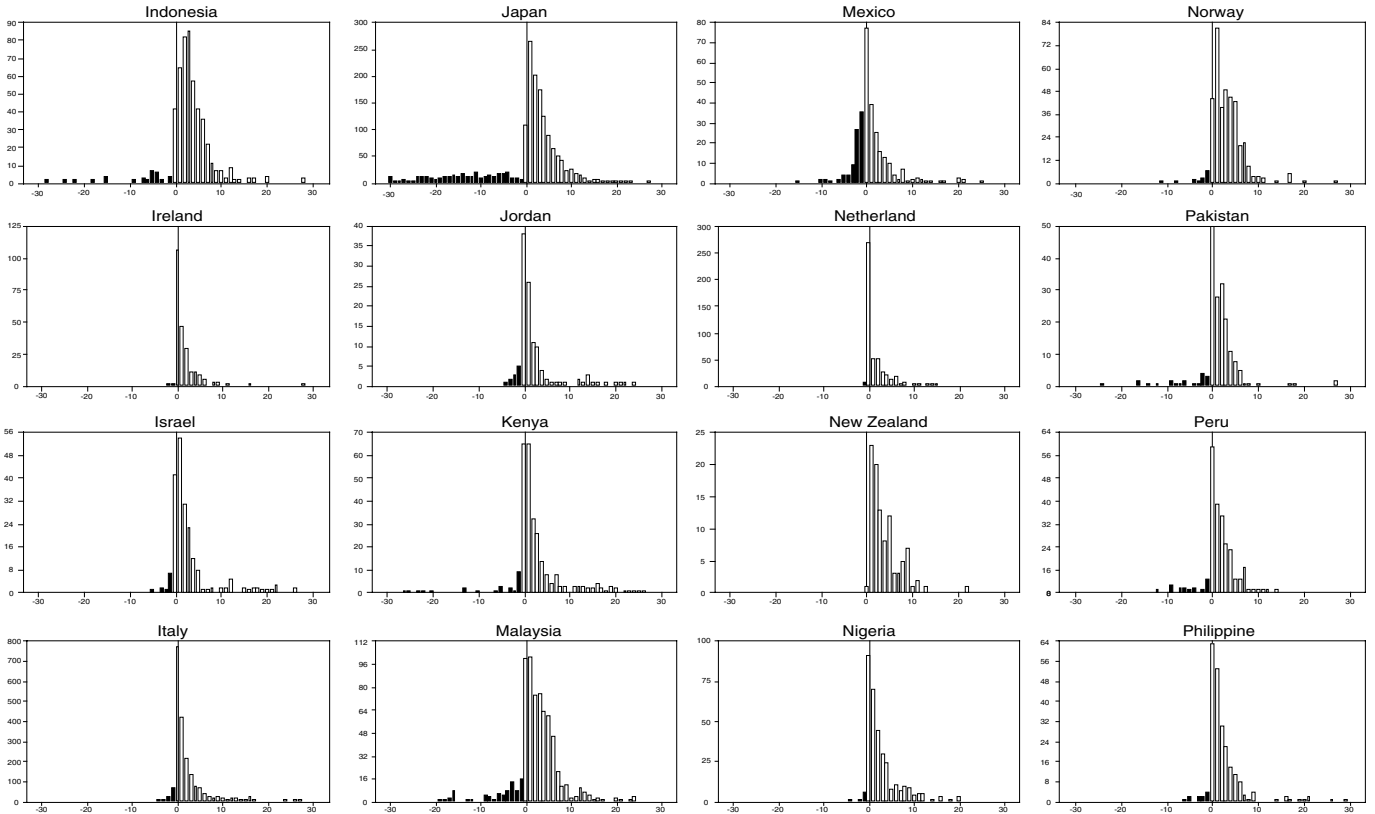


Fig. 2 (*continued*)

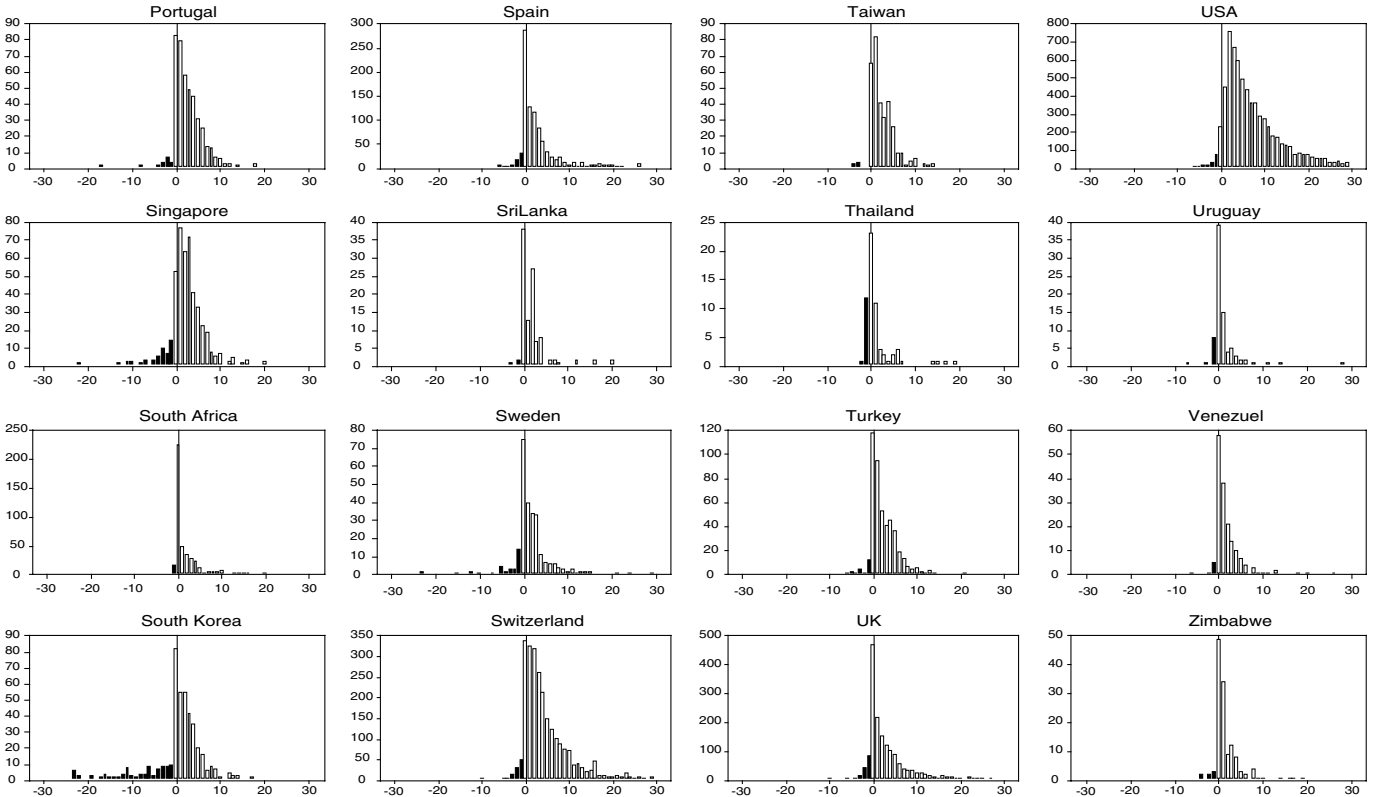


Fig. 2 (*continued*)

### 2.2. The statistical evidence

#### 2.2.1. Earnings management measures

We use three measures of earnings management (EM), following Burgstahler and Dichev (1997), Degeorge et al. (1999), and Leuz et al. (2003), to test whether banks manage their earnings so as to exceed thresholds, such as zero earnings and zero earnings changes, respectively. The first three measures shown below are originally designed to evaluate the extent of managed earnings. For example, the sharp drop-at-zero graph shown in Fig. 1's panel A indicates earnings management.

Our null hypothesis is that there is no earnings management in the banking industry, which suggests that the pooled cross-sectional distributions of earnings levels (or those of earnings changes) are smooth; where "smooth" means that the expected number of observations in any given interval of the distribution is the average of the number of observations in the two immediately adjacent intervals. To test this null hypothesis, Burgstahler and Dichev (1997) propose the statistic, EM1, which is the difference between the actual and expected number of observations for the interval immediately to the right of zero:

$$\mathrm{EM1} = \frac{\mathrm{AQ}_i - \mathrm{EQ}_i}{\mathrm{SD}_i}, \tag{1}$$

where $\mathrm{AQ}_i$ and $\mathrm{EQ}_i$ are the actual and expected numbers of observations for interval $i$, and where the interval is immediately to the right of zero; and $\mathrm{SD}_i$ is the estimated standard deviation of the difference between the actual and expected numbers of observations around interval $i$. In particular, $\mathrm{EQ}_i = (\mathrm{AQ}_{i-1} + \mathrm{AQ}_{i+1})/2$. [4]

Degeorge et al. (1999) construct another earnings management statistic, EM2, which examines the distribution underlying the histogram. If there is no earnings management, then the distribution is continuous and smooth at the threshold point, i.e., zero earnings level (or zero earnings changes).

$$\mathrm{EM2} = \frac{\Delta p_i - \mathrm{MEAN}(\Delta p_{-i})}{\mathrm{SD}(\Delta p_{-i})}, \tag{2}$$

where $p_i$ is the ratio of the actual number of observations for interval $i$ to bank-years, $\Delta p_i = p_i - p_{i-1}$. $\mathrm{MEAN}(\Delta p_{-i})$ is the average value of $\Delta p$, excluding $p_i$, i.e., $(\sum_{k=-5;k\neq 0}^{5} \Delta p_{i+k})/10$, and $\mathrm{SD}(\Delta p_{-i})$ is the standard deviation of $\Delta p$, excluding $\Delta p_i$. Statistic EM2 is distributed as a Student's $t$-distribution under $H_0$.

The third of the earnings management measures we consider computes the ratio of the actual number of observations for interval $i$ (the "small profits level" or "small profits increase") to that of observations for the interval $i-1$ (the "small losses level" or "small profits decrease") (Burgstahler and Dichev, 1997; Leuz et al., 2003). Hence, EM3 is the ratio of the frequency of small profits to small losses, i.e.,

[4] $\mathrm{SD}_i = [Np_i(1-p_i) + (1/4)N(p_{i-1}+p_{i+1})(1-p_{i-1}-p_{i+1})]^{1/2}$, where $N$ represents the bank-years of each country; $p_i$ is the proportion of the actual number of observations for interval $i$ to the bank-years; $\mathrm{AQ}_i/N$. $p_{i-1}$ and $p_{i+1}$ are equal to $\mathrm{AQ}_{i-1}/N$ and $\mathrm{AQ}_{i+1}/N$, respectively.

$$\mathrm{EM3} = \mathrm{AQ}_i/\mathrm{AQ}_{i-1}. \tag{3}$$

Note that EM3 is not a statistic, but simply a ratio. Thus, unlike EM1 and EM2, which can be used to evaluate the null hypothesis, EM3 cannot assess the null hypothesis. When EM3 is much greater than unity, banks tend to manage earnings. A higher EM3 indicates a stronger EM.

To aggregate the three earnings management measures discussed above, following Leuz et al. (2003), we create two aggregate earnings management measures: AEM and ADEM. AEM is created by averaging the ranks of all three measures – EM1, EM2, EM3 – to measure the aggregate extent to which banks manage earnings to avoid earnings losses:

$$\mathrm{AEM} = [\mathrm{Rank}(\mathrm{EM1}) + \mathrm{Rank}(\mathrm{EM2}) + \mathrm{Rank}(\mathrm{EM3})]/3. \tag{4}$$

ADEM is created by averaging the ranks of all three measures – EM1, EM2, EM3 – to measure the aggregate extent to which banks manage earnings to avoid earnings decreases, i.e.,

$$\mathrm{ADEM} = [\mathrm{Rank}(\mathrm{EM1}) + \mathrm{Rank}(\mathrm{EM2}) + \mathrm{Rank}(\mathrm{EM3})]/3. \tag{5}$$

And we will use AEM and ADEM as the dependent variables in multiple regression analyses in a later section.

### 2.2.2. Empirical evidence

Table 1 provides the results of banks' earnings management used to exceed zero earnings, i.e., to avoid earnings losses. The first column reports the number of bank observations for seven years used in each country. The next three columns report the estimated results of EM1, EM2 and EM3, which are often used in the literature. As can be observed in the table, the statistics of EM1 are significantly different from zero for 42 out of 48 countries, while those of EM2 are significantly different from zero for 47 out of 48 countries, rejecting the null of no earnings management. With regard to EM3, most countries do have high EM3 ratios, but we cannot make any formal inference from it since there is no standard deviation. [5] Thus, the use by banks of earnings management to avoid earnings losses seems common for most countries.

Table 2 provides the estimation results of earnings management using zero earnings changes as the threshold, i.e., so as to avoid earnings decreases. The statistics of EM1 are significantly different from zero for about 41 out of 48 countries, while those of EM2 are significantly different from zero for about 21 out of 48 countries, rejecting the null of no earnings management. With regard to EM3, the mean value of the ratios is 1.441, indicating that banks have an incentive to avoid earnings decreases, although the ratios are lower in Table 2 than in Table 1. Again, the extent to which banks manage earnings to avoid earnings decreases also seems common for most countries, but not so significant as that to avoid earnings losses.

[5] To ensure that EM3 is computed with reasonable bounds, we require that there is at least one observation in the interval $i-1$ (the "small losses") for a country to be included in our sample. As a result, we omit New Zealand from the sample, due to the requirement.

Table 1
Earnings management to avoid earnings losses

| | Country | Numbers of observations | Threshold: earnings = 0 | | |
|---|---|---|---|---|---|
| | | | EM1 | EM2 | EM3 |
| 1. | Australia | 812 | 3.936*** | 6.541*** | 7.294 |
| 2. | Austria | 786 | 4.923*** | 10.280*** | 13.125 |
| 3. | Belgium | 856 | 10.546*** | 5.359*** | 10.000 |
| 4. | Brazil | 1181 | 4.530*** | 6.090*** | 3.550 |
| 5. | Canada | 424 | 12.923*** | 3.763*** | 4.511 |
| 6. | Chile | 286 | 4.461*** | 3.595*** | 4.143 |
| 7. | Colombia | 317 | 5.270*** | 3.613*** | 2.800 |
| 8. | Denmark | 861 | 4.573*** | 7.716*** | 21.600 |
| 9. | Ecuador | 160 | 5.770*** | 5.795*** | 9.333 |
| 10. | Egypt | 275 | 8.158*** | 7.458*** | 97.000 |
| 11. | Finland | 131 | 3.965*** | 3.594*** | 4.600 |
| 12. | France | 4016 | 9.836*** | 8.936*** | 6.000 |
| 13. | Germany | 9591 | 20.242*** | 3.335*** | 20.367 |
| 14. | Greece | 235 | 5.168*** | 6.424*** | 11.167 |
| 15. | Hong Kong | 1060 | 11.375*** | 6.716*** | 9.552 |
| 16. | India | 533 | 3.654*** | 6.459*** | 5.941 |
| 17. | Indonesia | 576 | 1.020 | 2.610*** | 10.500 |
| 18. | Ireland | 264 | 9.512*** | 6.017*** | 106.000 |
| 19. | Israel | 212 | 1.584* | 3.713*** | 5.857 |
| 20. | Italy | 2618 | 20.746*** | 6.223*** | 11.029 |
| 21. | Japan | 1798 | −2.134 | 1.733** | 12.111 |
| 22. | Jordan | 119 | 4.003*** | 6.046*** | 7.600 |
| 23. | Kenya | 287 | 3.500*** | 5.395*** | 7.222 |
| 24. | Malaysia | 711 | 3.950*** | 8.643*** | 6.250 |
| 25. | Mexico | 309 | 4.655*** | 2.925*** | 2.139 |
| 26. | Netherlands | 550 | 19.329*** | 4.225*** | 38.286 |
| 27. | New Zealand | 104 | 0.542 | 2.560*** | NA |
| 28. | Nigeria | 348 | 5.851*** | 8.742*** | 15.167 |
| 29. | Norway | 386 | 0.000 | 1.939** | 6.286 |
| 30. | Pakistan | 188 | 5.251*** | 6.383*** | 16.667 |
| 31. | Peru | 183 | 4.974*** | 7.050*** | 10.200 |
| 32. | Philippines | 235 | 4.574*** | 8.258*** | 15.750 |
| 33. | Portugal | 453 | 4.450*** | 10.553*** | 16.600 |
| 34. | Singapore | 500 | 0.861 | 2.622*** | 3.533 |
| 35. | South Africa | 478 | 16.767*** | 4.070*** | 13.294 |
| 36. | South Korea | 455 | 5.495*** | 8.004*** | 8.200 |
| 37. | Spain | 1170 | 13.135*** | 5.508*** | 9.258 |
| 38. | Sri Lanka | 107 | 5.792*** | 3.485*** | 19.000 |
| 39. | Sweden | 281 | 5.913*** | 4.939*** | 5.357 |
| 40. | Switzerland | 2706 | 7.756*** | 9.790*** | 6.588 |
| 41. | Taiwan | 347 | 2.945*** | 4.370*** | 66.000 |
| 42. | Thailand | 64 | 2.680*** | 1.981** | 8.889 |
| 43. | Turkey | 497 | 6.071*** | 7.216*** | 9.077 |
| 44. | UK | 1874 | 15.540*** | 4.983*** | 5.465 |
| 45. | United States | 7461 | −1.720 | 0.902 | 2.962 |
| 46. | Uruguay | 90 | 5.354*** | 3.886*** | 4.875 |
| 47. | Venezuela | 172 | 5.352*** | 7.314*** | 11.600 |

Table 1 (*continued*)

| | Country | Numbers of observations | Threshold: earnings = 0 | | |
|---|---|---|---|---|---|
| | | | EM1 | EM2 | EM3 |
| 48. | Zimbabwe | 139 | 4.915*** | 5.592*** | 16.333 |
| | Average | | 6.417 | 5.486 | 15.087 |
| | Standard deviation | | 5.279 | 2.366 | 21.147 |

***, **, and * represent significance at the levels at 0.01, 0.05, and 0.10, respectively.

Table 3 provides the simple correlation coefficients between different EM measures. The correlation coefficients vary across measures. We report the simple correlation here and in the text. Basically, the correlation coefficients vary across measures. The lowest correlation, which is −0.051, is between EM2 to avoid earnings losses and EM2 to avoid earnings decreases, and the highest correlation, which is 0.901, is between EM2 to avoid earnings decreases and EM3 to avoid earnings decreases.

## 3. Can prospect theory explain why banks manage earnings to exceed thresholds?

As suggested by Burgstahler and Dichev (1997) and Degeorge et al. (1999), we try to test if the prospect theory is the motivation for earnings management. Banks that have five years of data, for the period 1994–1998, were first used in this section, in order to minimize the bias of the measures. [6] In testing whether or not an asymmetric risk–return association exists, we follow Fiegenbaum's (1990) approach to calculate return and risk, which are proxied by the means and standard deviation of bank earnings (or earnings changes), respectively. That is, we calculate mean (as "RETURN") and standard deviation (as "RISK") of earnings (or earnings changes) of each bank for the 1994–1998 time period.

For each country, banks are divided into two groups: "high earnings group" and "low earnings group", where the former denotes banks with earnings (or earnings changes) higher than the threshold, zero earnings (or zero earnings change), and the latter consists of banks with earnings (or earnings changes) lower than earnings thresholds. We regress "risk" on "return" for each group:

$$\begin{aligned} \mathrm{RISK}_{ij} &= \alpha_{iL} + \beta_{iL}\mathrm{RETURN}_{ij} + \varepsilon_{ij} \quad \text{if } j \in \text{low earnings group } (L), \\ \mathrm{RISK}_{ij} &= \alpha_{iH} + \beta_{iH}\mathrm{RETURN}_{ij} + \varepsilon_{ij} \quad \text{if } j \in \text{high earnings group } (H), \end{aligned} \tag{6}$$

where $i$ denotes country ($i = 1, 2, \ldots, 48$), $j$ denotes bank ($i = 1, 2, \ldots, 48$), and $L$ and $H$ represent low and high earnings groups, respectively. $\alpha_i$ is the constant term for

[6] This is because banks with less than five years' data may provide less reliable estimates. We also conduct robust testing to include those banks which have at least four years' data (1994–1998). Although not reported here, our hypothesis of the prospect theory is in fact even strengthened.

Table 2
Earnings management to avoid earnings decreases

| | Country | Numbers of observations | Threshold: earnings changes = 0 | | |
|---|---|---|---|---|---|
| | | | EM1 | EM2 | EM3 |
| 1. | Australia | 656 | 1.319* | 0.218 | 1.055 |
| 2. | Austria | 614 | 2.614*** | 1.561* | 1.375 |
| 3. | Belgium | 701 | 6.458*** | 2.479*** | 1.986 |
| 4. | Brazil | 911 | 0.089 | −0.499 | 0.893 |
| 5. | Canada | 342 | 3.563*** | 1.526* | 1.520 |
| 6. | Chile | 235 | 2.448*** | 0.763 | 1.190 |
| 7. | Colombia | 244 | 2.601*** | 0.161 | 1.043 |
| 8. | Denmark | 713 | 3.329*** | 0.431 | 1.102 |
| 9. | Ecuador | 104 | 1.999** | 0.136 | 1.040 |
| 10. | Egypt | 231 | 5.877*** | 4.136*** | 3.882 |
| 11. | Finland | 106 | 3.433*** | 2.805*** | 3.071 |
| 12. | France | 3304 | 3.959*** | 0.762 | 1.157 |
| 13. | Germany | 7612 | 8.092*** | −0.046 | 0.983 |
| 14. | Greece | 189 | 1.739** | 0.979 | 1.267 |
| 15. | Hong Kong | 837 | 2.682*** | 2.138** | 1.604 |
| 16. | India | 445 | 5.101*** | 4.674*** | 3.194 |
| 17. | Indonesia | 446 | 2.732*** | 2.700*** | 1.884 |
| 18. | Ireland | 201 | 2.744*** | 1.930** | 1.643 |
| 19. | Israel | 177 | 2.011** | 0.449 | 1.135 |
| 20. | Italy | 2111 | 8.015*** | 1.735** | 1.542 |
| 21. | Japan | 1477 | 5.573*** | 0.075 | 1.021 |
| 22. | Jordan | 101 | 3.490*** | 1.092 | 1.563 |
| 23. | Kenya | 219 | 0.082 | −1.504 | 0.756 |
| 24. | Malaysia | 557 | 1.984** | 0.956 | 1.233 |
| 25. | Mexico | 227 | 1.093 | 0.314 | 1.075 |
| 26. | Netherlands | 431 | 6.556*** | 1.877** | 1.887 |
| 27. | New Zealand | 83 | 1.720** | 1.708** | 2.000 |
| 28. | Nigeria | 263 | 0.705 | −0.244 | 0.936 |
| 29. | Norway | 305 | 0.463 | −0.516 | 0.891 |
| 30. | Pakistan | 154 | 3.144*** | 1.601* | 1.560 |
| 31. | Peru | 150 | −0.651 | −1.292 | 0.706 |
| 32. | Philippines | 173 | 1.864** | −0.113 | 0.949 |
| 33. | Portugal | 368 | 1.508* | 1.226 | 1.298 |
| 34. | Singapore | 396 | 4.275*** | 1.502* | 1.500 |
| 35. | South Africa | 357 | 5.271*** | 1.291* | 1.538 |
| 36. | South Korea | 364 | 3.311*** | 0.218 | 1.056 |
| 37. | Spain | 952 | 3.022*** | 0.950 | 1.266 |
| 38. | Sri Lanka | 86 | 2.695*** | 1.180 | 1.500 |
| 39. | Sweden | 220 | 1.995** | −0.316 | 0.906 |
| 40. | Switzerland | 2208 | 8.496*** | 1.280 | 1.435 |
| 41. | Taiwan | 285 | 4.052*** | 2.034** | 1.675 |
| 42. | Thailand | 43 | 1.665** | 0.529 | 0.817 |
| 43. | Turkey | 364 | 4.091*** | 1.159 | 1.368 |
| 44. | UK | 1478 | 6.126*** | 1.780** | 1.528 |
| 45. | United States | 6222 | 2.522*** | 1.148 | 1.166 |
| 46. | Uruguay | 55 | 2.678*** | 3.199*** | 2.714 |
| 47. | Venezuela | 111 | −1.616 | −2.678 | 0.438 |

Table 2 (*continued*)

| | Country | Numbers of observations | Threshold: earnings changes = 0 | | |
|---|---|---|---|---|---|
| | | | EM1 | EM2 | EM3 |
| 48. | Zimbabwe | 104 | 3.010*** | 1.938** | 1.833 |
| | Average | | 3.124 | 1.030 | 1.441 |
| | Standard deviation | | 2.207 | 1.342 | 0.655 |

***, ** and * represent significance at the levels at the 0.01, 0.05, and 0.10, respectively.

Table 3
The simple correlations coefficients between different EM measures

| | EM to avoid earnings losses | | | EM to avoid earnings decreases | | |
|---|---|---|---|---|---|---|
| | EM1 | EM2 | EM3 | EM1 | EM2 | EM3 |
| EM to avoid earnings losses | | | | | | |
| EM1 | | 0.160 | 0.162 | 0.574 | 0.146 | 0.096 |
| EM2 | | | 0.117 | −0.028 | −0.051 | −0.041 |
| EM3 | | | | 0.186 | 0.320 | 0.388 |
| EM to avoid earnings decreases | | | | | | |
| EM1 | | | | | 0.546 | 0.434 |
| EM2 | | | | | | 0.901 |
| EM3 | | | | | | |

The table presents correlation coefficients between earnings management measures. There are three measures, EM1, EM2, and EM3, to measure the extent to which banks manage earnings to avoid earnings losses and to avoid earnings decreases, respectively. When EM1, EM2, EM3 are higher, the extents to which banks manage earnings are higher.

country, and $\beta_i$ is the coefficient which measures the tradeoff between risk and return for country $i$.

Similar to Fiegenbaum (1990), if prospect theory can explain the risk–return association, the sign on $\beta_L$ should be negative, the sign on $\beta_H$ should be positive, and the absolute value of $\beta_L$ must be larger than that of $\beta_H$. That is, if we find $\beta_H > 0 > \beta_L$ and $|\beta_L| > |\beta_H|$, then we cannot reject the hypothesis that the given earnings thresholds are reference points corresponding to prospect theory.

Table 4 summarizes the results for the model (6) across 48 countries. The earnings threshold is zero earnings in Panel A, while the earnings threshold is zero earnings changes in Panel B. We find that data on the banking industry across 48 countries provides strong evidence that prospect theory can explain the tradeoff between risk and return, i.e., banks above the earnings threshold are found to be risk averters while banks below the earnings threshold are found to be risk lovers. Therefore, we cannot reject the hypothesis that prospect theory explains banks' motivation in managing earnings to exceed thresholds. We explain the empirical results as follows.

From the left-hand side of Panel A, for most countries, banks in the "high earnings group" have a positive relation between risk and return (measured as $\beta_H$) and are risk-averters. More specifically, except for two countries having insufficient

Table 4
The motivation of earnings management: prospect theory

| | Country | Panel A | | | | Panel B | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Earnings threshold: earnings = 0 | | | | Earnings threshold: earnings change = 0 | | | |
| | | High earnings group | | Low earnings group | | High earnings group | | Low earnings group | |
| | | $\beta_H$ | $N$ | $\beta_L$ | $N$ | $\beta_H$ | $N$ | $\beta_L$ | $N$ |
| 1. | Australia | 0.532*** | 81 | −4.510*** | 3 | 1.453*** | 50 | −1.604*** | 34 |
| 2. | Austria | 0.701*** | 56 | −1.700* | 5 | 2.220* | 29 | −1.934*** | 32 |
| 3. | Belgium | 1.065*** | 77 | −2.693** | 11 | 1.700*** | 49 | −1.719*** | 39 |
| 4. | Brazil | 0.377*** | 96 | −1.691*** | 11 | 1.479*** | 35 | −1.084* | 72 |
| 5. | Canada | 0.095*** | 37 | −1.900*** | 7 | 5.741*** | 28 | −1.354*** | 16 |
| 6. | Chile | 0.521*** | 30 | −5.679*** | 5 | 2.241*** | 17 | −0.702*** | 18 |
| 7. | Colombia | 0.768*** | 21 | −1.774** | 7 | 0.879 | 7 | −2.494*** | 21 |
| 8. | Denmark | 0.448*** | 102 | NA | 1 | 1.658*** | 91 | −0.911 | 12 |
| 9. | Ecuador | NA | 1 | NA | 1 | NA | 1 | NA | 1 |
| 10. | Egypt | 0.185*** | 36 | NA | 0 | 0.565 | 29 | −0.818** | 7 |
| 11. | Finland | −0.044 | 11 | 2.915 | 3 | 0.841*** | 13 | NA | 1 |
| 12. | France | 0.635*** | 379 | −1.265*** | 100 | 1.903*** | 296 | −2.953*** | 183 |
| 13. | Germany | 0.251*** | 1009 | −2.522*** | 24 | 1.589*** | 385 | −1.899*** | 648 |
| 14. | Greece | 0.170*** | 20 | −0.482** | 6 | 1.960*** | 12 | −0.345 | 14 |
| 15. | Hong Kong | 0.244*** | 87 | −1.282*** | 10 | 1.270 | 17 | −1.413*** | 80 |
| 16. | India | 0.277*** | 63 | −1.403*** | 8 | 1.077*** | 36 | −1.187*** | 35 |
| 17. | Indonesia | 0.289*** | 53 | −1.775** | 3 | 1.090*** | 6 | −1.703*** | 34 |
| 18. | Ireland | 0.912*** | 19 | NA | 0 | 1.496** | 15 | −1.706*** | 4 |
| 19. | Israel | 1.651*** | 24 | NA | 2 | 2.401*** | 15 | −1.301* | 11 |
| 20. | Italy | 0.405*** | 229 | −1.405*** | 42 | 2.640*** | 189 | −1.661*** | 82 |
| 21. | Japan | 1.514*** | 93 | −1.327*** | 124 | 1.301*** | 28 | −1.672*** | 189 |
| 22. | Jordan | 0.214*** | 14 | NA | 2 | 4.295* | 5 | −0.860 | 11 |
| 23. | Kenya | 0.227*** | 20 | NA | 2 | NA | 2 | −1.385*** | 20 |
| 24. | Malaysia | 0.253 | 48 | −1.793*** | 13 | −0.159 | 10 | −1.185*** | 57 |
| 25. | Mexico | 1.263*** | 13 | −2.197** | 3 | −3.607 | 4 | −13.264** | 12 |
| 26. | Netherlands | 0.420*** | 48 | NA | 1 | 0.800*** | 41 | −3.365** | 8 |
| 27. | New Zealand | 0.058 | 12 | NA | 0 | 1.444 | 3 | −1.463** | 9 |
| 28. | Nigeria | 0.245*** | 24 | NA | 1 | 0.878 | 10 | −0.539 | 15 |
| 29. | Norway | 0.218*** | 38 | NA | 0 | 0.433 | 14 | −0.303 | 24 |
| 30. | Pakistan | 0.419*** | 18 | −1.875*** | 3 | 1.140 | 10 | −1.405* | 11 |
| 31. | Peru | 0.404*** | 22 | NA | 1 | 1.128 | 11 | −0.520* | 12 |
| 32. | Philippines | 0.154*** | 17 | NA | 1 | 2.556* | 4 | −1.642* | 12 |
| 33. | Portugal | 0.272*** | 45 | −0.706 | 4 | 0.894*** | 34 | −1.375*** | 15 |
| 34. | Singapore | 0.109 | 34 | −1.874*** | 10 | 0.266 | 6 | −1.314** | 38 |
| 35. | South Africa | 0.470*** | 35 | NA | 0 | 1.622*** | 31 | −0.522* | 4 |
| 36. | South Korea | 0.344* | 15 | −0.758*** | 25 | NA | 2 | −1.289*** | 38 |
| 37. | Spain | 0.349*** | 111 | −5.324*** | 16 | 1.670*** | 103 | −13.974*** | 24 |
| 38. | Sri Lanka | 0.541*** | 11 | NA | 1 | NA | 2 | −3.439*** | 10 |
| 39. | Sweden | 0.301*** | 23 | −0.927** | 3 | 0.570*** | 14 | −0.793* | 12 |
| 40. | Switzerland | 0.604*** | 283 | −1.654*** | 13 | 1.241*** | 249 | −3.113*** | 47 |
| 41. | Taiwan | 0.174*** | 37 | NA | 2 | 1.593*** | 21 | −0.722 | 18 |
| 42. | Thailand | NA | 1 | NA | 0 | NA | 0 | NA | 1 |
| 43. | Turkey | 1.203*** | 41 | −2.443*** | 5 | 0.822 | 27 | −0.379 | 19 |

Table 4 (*continued*)

| | Country | Panel A | | | | Panel B | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Earnings threshold: earnings = 0 | | | | Earnings threshold: earnings change = 0 | | | |
| | | High earnings group | | Low earnings group | | High earnings group | | Low earnings group | |
| | | $\beta_H$ | $N$ | $\beta_L$ | $N$ | $\beta_H$ | $N$ | $\beta_L$ | $N$ |
| 44. | UK | 0.195*** | 143 | −1.588*** | 11 | 2.080*** | 98 | −1.940*** | 56 |
| 45. | United States | 0.659*** | 905 | −2.020*** | 14 | 0.457*** | 506 | −1.818*** | 413 |
| 46. | Uruguay | 0.886*** | 3 | NA | 0 | NA | 2 | NA | 1 |
| 47. | Venezuela | 0.965*** | 12 | NA | 0 | 1.082 | 7 | −5.015*** | 5 |
| 48. | Zimbabwe | 0.599*** | 10 | NA | 0 | 1.180*** | 6 | −3.121 | 4 |
| | Average | 0.490 | | −1.845 | | 1.378 | | −2.118 | |

sample size, Ecuador and Thailand, coefficients were positive, while only 1 was negative. In addition, 42 out of the 45 positive coefficients were significant. These results clearly represent that banks above the earnings threshold are risk-averters. Secondly, the right-hand side of Panel A describes the results (measured as $\beta_L$) for the below threshold. Except for 20 countries with insufficient sample size, 27 coefficients were negative while only 1 was positive. [7] In addition, 26 out of the 27 negative coefficients were significantly negative. These results represent that banks in the "low earnings group" have negative risk–return association and are risk-lovers. Finally, the mean value for below threshold is −1.845 while that above the threshold is 0.490. The data support the argument of Fiegenbaum (1990) by a ratio of nearly 4 to 1, i.e., there is a steeper association for risk–return relationships for below threshold banks, than for above threshold banks.

Also, it can be seen, from the left-hand side of Panel B, that for most countries, banks in the "high earnings group" have positive risk–return association (measured as $\beta_H$). Except for 6 countries with insufficient sample size, 40 coefficients were positive while only 2 were negative. In addition, 29 out of the 40 positive coefficients were significantly positive. Similar to the results of Panel A, these results represent that banks above the earnings threshold are risk-averters. Secondly, the right-hand side of Panel B describes the results (measured as $\beta_L$) corresponding to being below the threshold. Except for four countries with insufficient sample size, 44 coefficients were negative while no country was positive. In addition, 36 out of the 44 negative coefficients were statistically significant. These results indicate that banks in the "low earnings group" have an inverse risk–return relation and are risk-lovers.

[7] It may well be that the reason there are 20 countries with insufficient data (only 2 observations or less) is that banks may have very high incentives to manage earnings to avoid earnings losses in these 20 countries.

Finally, the mean value for below threshold is −2.118 while for the above threshold it is 1.378. Again, a ratio of almost 2 to 1 supports the argument of Fiegenbaum (1990).

## 4. The role of investor protection: Multiple regression analysis

### 4.1. The institutional factors

Following Leuz et al. (2003) and using the insights of LLSV (1998), we analyze the association between investor protection and earnings management in a multiple regression setting. As shown in Table 5, the investor protection factors include: (1) director rights, which is the "anti-director rights" index from La Porta et al. (1998), and is an aggregate measure of (minority) shareholder rights, and ranging from 0 to 6; (2) legal enforcement, which is measured as the mean score across three legal variables used in La Porta et al. (1998): (a) the efficiency of the judicial system, (b) an assessment of rule of law, and (c) the corruption index. All three variables range from 0 to 10.

We also account for other potential determinants of earnings management in this setting, such as accounting disclosures and insider trading quality. As shown in Table 5, the disclosure index, which is the "accounting disclosure" index from LLSV (1998), measures the inclusion or omission of 90 items in the 1990 annual reports. The insider trading is the average "insider trading" index from 1993 to 1999 and extracted from the *World Competitiveness Yearbook*. The variable ranges from 0 to 10, and the higher the variable, the less the extent of insider trading.

Similar to Leuz et al. (2003), to see whether our findings are just driven by a country's economic development, we also re-estimate our regressions using *contemporaneous* per-capita GDP as an additional explanatory variable, which is country's average per-capita real GDP between 1993 and 1999. [8]

As shown in Table 5, institutional factors are not available for part of our sample countries. Moreover, similar to Leuz et al. (2003), hyperinflation unduly affects the computation of the earnings management measures, thus we were forced to exclude sample countries with hyperinflation during our sample periods, including Brazil, Colombia, Chile, Mexico, Peru, Turkey and Venezuela. [9] Furthermore, the accounting disclosure index is not available for Ecuador, Indonesia, Ireland, Jordan, Kenya, Pakistan, Sri Lanka, and Zimbabwe. The insider trading index is not available for Ecuador, Kenya, Nigeria, Sri Lanka, Uruguay, and Zimbabwe. As a result, there are 30 sample countries left in the multiple regressions.

[8] We take the natural log of the per-capita GDP when running multiple regressions.

[9] The results, however, are qualitatively unchanged if these countries remain in the sample.

Table 5
Institutional characteristics of the sample countries

| | Country | Insider trading index | Accounting disclosure index | Per-capita GDP (US$) (1993–1999) | Antidirector right | Legal enforcement | Hyper-inflation | Legal origin |
|---|---|---|---|---|---|---|---|---|
| 1. | Australia | 7.83 | 75 | 19,692.64 | 4 | 9.30 | No | English |
| 2. | Austria | 5.51 | 54 | 25,719.38 | 2 | 9.47 | No | German |
| 3. | Belgium | 6.40 | 61 | 24,416.15 | 0 | 9.49 | No | French |
| 4. | Brazil | 4.51 | 54 | 2864.07 | 3 | 6.52 | Yes | French |
| 5. | Canada | 7.26 | 74 | 19,990.25 | 5 | 9.58 | No | English |
| 6. | Chile | 5.75 | 52 | 4101.06 | 5 | 6.77 | Yes | French |
| 7. | Colombia | 4.36 | 50 | 1850.11 | 3 | 5.66 | Yes | French |
| 8. | Denmark | 8.43 | 62 | 31,070.06 | 2 | 9.80 | No | Scandinavian |
| 9. | Ecuador | NA | NA | 2855 | 2 | 5.97 | No | French |
| 10. | Egypt | 4.00 | 24 | 1065.29 | 2 | 5.38 | No | French |
| 11. | Finland | 7.15 | 77 | 22,994.26 | 3 | 9.80 | No | Scandinavian |
| 12. | France | 5.82 | 69 | 24,489.51 | 3 | 8.97 | No | French |
| 13. | Germany | 6.89 | 62 | 26,396.85 | 1 | 9.37 | No | German |
| 14. | Greece | 4.13 | 55 | 10,147.68 | 2 | 6.84 | No | French |
| 15. | Hong Kong | 5.69 | 69 | 22,181.19 | 5 | 8.77 | No | English |
| 16. | India | 3.56 | 57 | 352.83 | 5 | 6.12 | No | English |
| 17. | Indonesia | 4.02 | NA | 787.61 | 2 | 4.38 | No | French |
| 18. | Ireland | 7.03 | NA | 19,614.02 | 4 | 8.74 | No | English |
| 19. | Israel | 5.63 | 64 | 14,342.75 | 3 | 7.79 | No | English |
| 20. | Italy | 4.75 | 62 | 19,168.05 | 1 | 7.95 | No | French |
| 21. | Japan | 6.19 | 65 | 39,934.66 | 4 | 9.37 | No | German |
| 22. | Jordan | 4.24 | NA | 1148.26 | 1 | 5.88 | No | French |
| 23. | Kenya | NA | NA | 294.71 | 3 | 5.53 | No | English |
| 24. | Malaysia | 4.76 | 76 | 3819.98 | 4 | 7.71 | No | English |
| 25. | Mexico | 4.23 | 60 | 3586.74 | 1 | 5.99 | Yes | French |
| 26. | Netherlands | 6.85 | 64 | 23,202.14 | 2 | 9.87 | No | French |
| 27. | New Zealand | 7.25 | 70 | 15,138.55 | 4 | 9.80 | No | English |
| 28. | Nigeria | NA | 59 | NA | 3 | 4.54 | No | English |
| 29. | Norway | 6.01 | 74 | 31,952.32 | 3 | 9.76 | No | Scandinavian |
| 30. | Pakistan | 2.60 | NA | 378.80 | 5 | 4.30 | No | English |
| 31. | Peru | 4.86 | 38 | 1879.95 | 3 | 4.83 | Yes | French |
| 32. | Philippines | 3.97 | 65 | 935.42 | 3 | 4.08 | No | French |
| 33. | Portugal | 5.25 | 36 | 16,580.79 | 3 | 7.81 | No | French |
| 34. | Singapore | 7.61 | 78 | 21,720.24 | 4 | 8.99 | No | English |
| 35. | South Africa | 5.24 | 70 | 3143.21 | 5 | 6.70 | No | English |
| 36. | South Korea | 5.17 | 62 | 8875.06 | 2 | 6.71 | No | German |
| 37. | Spain | 4.83 | 64 | 18,453.33 | 4 | 7.87 | No | French |
| 38. | Sri Lanka | NA | NA | 704.86 | 3 | 5.04 | No | English |
| 39. | Sweden | 6.89 | 83 | 25,822.46 | 4 | 9.92 | No | Scandinavian |
| 40. | Switzerland | 6.78 | 68 | 37,722.05 | 2 | 9.99 | No | German |
| 41. | Taiwan | 3.82 | 65 | 12,394.40 | 3 | 8.08 | No | German |
| 42. | Thailand | 3.63 | 64 | 2273.33 | 2 | 5.93 | No | English |
| 43. | Turkey | 4.23 | 51 | 1624.57 | 2 | 5.46 | Yes | French |
| 44. | UK | 6.75 | 78 | 20,050.31 | 5 | 9.40 | No | English |
| 45. | United States | 6.45 | 71 | 28,969.53 | 5 | 9.52 | No | English |
| 46. | Uruguay | NA | 31 | 4929.54 | 2 | 6.07 | No | French |
| 47. | Venezuela | 3.19 | 40 | 2387.50 | 1 | 6.15 | Yes | French |
| 48. | Zimbabwe | NA | NA | 477.71 | 3 | 5.45 | No | English |

### 4.2. Multiple regression results

Table 6 provides the results of rank regressions of investor protection and earnings management to "avoid earnings losses". First, the per-capita GDP and its interaction with legal enforcement do not impact banks' incentives to manage earnings to exceed "zero earnings" thresholds. Second, the coefficients of legal enforcement and those of insider trading are also insignificant across all equations. Third, before considering the accounting disclosure index, we find antidirector rights exhibit a significantly negative association with earnings management. The coefficient of antidirector rights is about −3.0 from Eqs. (A)–(E), which is consistent with the "diversion" hypothesis. But when the accounting disclosure index is considered, as in Eqs. (F) and (G), the coefficients of antidirector rights are no longer significant,

Table 6
Rank regressions of investor protection and earnings management to avoid earnings losses

| | AEM | | | | | | |
|---|---|---|---|---|---|---|---|
| | (A) | (B) | (C) | (D) | (E) | (F) | (G) |
| Constant | 45.013*** | 43.464*** | 45.931*** | 43.511*** | 45.791*** | 51.432*** | 55.484*** |
| | (4.434) | (2.745) | (4.227) | (2.761) | (4.056) | (3.905) | (4.286) |
| Per-capita GDP | | 0.373 | | 0.373 | | 0.538 | |
| | | (0.161) | | (0.161) | | (0.234) | |
| Per-capita GDP × legal enforcement | | | 0.028 | | 0.022 | | 0.055 |
| | | | (0.085) | | (0.065) | | (0.147) |
| Antidirector rights | −3.028*** | −2.981** | −3.001** | −2.992** | −3.016** | −1.687 | −1.702 |
| | (−2.713) | (−2.294) | (−2.266) | (−2.311) | (−2.258) | (−1.161) | (−1.135) |
| Legal enforcement | −1.344 | −1.597 | −1.733 | −1.745 | −1.794 | −0.454 | −0.859 |
| | (−1.299) | (−0.911) | (−0.400) | (−0.816) | (−0.424) | (−0.248) | (−0.170) |
| Insider trading | | | | 0.212 | 0.198 | | |
| | | | | (0.107) | (0.097) | | |
| Disclosure index | | | | | | −0.355*** | −0.355*** |
| | | | | | | (−2.880) | (−2.882) |
| $R^2$ | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.300 | 0.300 |
| Adjusted $R^2$ | 0.140 | 0.108 | 0.108 | 0.072 | 0.072 | 0.188 | 0.187 |
| Observations | 30 | 30 | 30 | 30 | 30 | 30 | 30 |

The table presents coefficients and *t*-statistics (in parentheses) from rank regressions of the aggregate earnings management measure on investor protection. AEM is created by averaging the ranks of all three measures – EM1, EM2, EM3 – to measure the aggregate extent to which banks manage earnings to avoid earnings losses. Antidirector rights index is from LLSV (1998). It is an aggregate measure of (minority) shareholder rights and ranges from 0 to 6. Legal enforcement is measured as the mean score across three legal variables used in LLSV (1998): (1) the efficiency of the judicial system, (2) an assessment of the rule of law, and (3) the corruption index. All three variables range from 0 to 10. The insider trading is the average "insider trading" index from 1993 to 1999 and extracted from the World Competitiveness Yearbook. It ranges from 0 to 10, and the higher the variable; the less is the extent of insider trading. The disclosure index measures the inclusion or omission of 90 items in the 1990 annual reports (LLSV, 1998). The average per-capita real GDP from 1993 to 1999 is extracted from the IFS database. ***, **, and * represent the significance at the 0.01, 0.05, and 0.10, respectively.

and the adjusted $R^2$ rises to 0.300. This suggests that, in order to mitigate banks' incentives to manage earnings to avoid "earnings losses" and thus improve the reliability of financial reports, stringent accounting disclosure requirements are more effective than strengthening antidirector rights, and the intuition behind the result is as follows.

Morck et al. (2000), for example, argue that in a country with poorer investor protection, an insider can predate the company's profit without getting punished. However, this holds only if outsiders do not know the existence of earnings management. Jin and Myers (2004) stress that Morck et al.'s (2000) inference does not consider the effect of transparency. They argue that imperfect protection for investors does not mislead outsiders if the firm is completely transparent. For example, if outsiders get informed and understand the possible adverse effect made by earnings management, they are suspicious about the reported financial statements. This makes

Table 7
Rank regressions of investor protection and earnings management to avoid earnings decreases

| | ADEM | | | | | | |
|---|---|---|---|---|---|---|---|
| | (A) | (B) | (C) | (D) | (E) | (F) | (G) |
| Constant | 24.449 | 59.534*** | −20.983 | 59.053*** | −20.057 | 67.980*** | −10.936 |
| | (1.578) | (3.355) | (−1.308) | (3.322) | (−1.271) | (5.873) | (−0.669) |
| Per-capita GDP | | −8.443*** | | −8.440*** | | −8.268*** | |
| | | (−3.342) | | (−3.506) | | (−3.716) | |
| Per-capita GDP × legal enforcement | | | −1.379*** | | −1.342*** | | −1.350*** |
| | | | (−3.234) | | (−3.108) | | (−3.873) |
| Antidirector rights | −0.492 | −1.557 | −1.827 | −1.444 | −1.723 | −0.186 | −0.461 |
| | (−0.319) | (−1.111) | (−1.323) | (−1.056) | (−1.268) | (−0.116) | (−0.290) |
| Legal enforcement | 0.462 | 6.199*** | 19.680*** | 7.702*** | 20.083*** | 7.411*** | 20.599*** |
| | (0.268) | (2.804) | (3.402) | (2.776) | (3.510) | (3.795) | (4.485) |
| Insider trading | | | | −2.155 | −1.310 | | |
| | | | | (−0.880) | (−0.553) | | |
| Disclosure index | | | | | | −0.377** | −0.374* |
| | | | | | | (−2.051) | (−1.921) |
| $R^2$ | 0.007 | 0.155 | 0.189 | 0.175 | 0.196 | 0.245 | 0.277 |
| Adjusted $R^2$ | −0.067 | 0.058 | 0.095 | 0.043 | 0.067 | 0.125 | 0.161 |
| Observations | 30 | 30 | 30 | 30 | 30 | 30 | 30 |

The table presents coefficients and t-statistics (in parentheses) from rank regressions of the aggregate earnings management measure on investor protection. ADEM is created by averaging the ranks of all three measures – EM1, EM2, EM3 – to measure the aggregate extent to which banks manage earnings to avoid earnings decreases. Antidirector rights index is from LLSV (1998). It is an aggregate measure of (minority) shareholder rights and ranges from 0 to 6. Legal enforcement is measured as the mean score across three legal variables used in LLSV (1998): (1) the efficiency of the judicial system, (2) an assessment of rule of law, and (3) the corruption index. All three variables range from 0 to 10. The insider trading is the average "insider trading" index from 1993 to 1999 and extracted from the World Competitiveness Yearbook. It ranges from 0 to 10, and the higher the variable; the extent to insider trading is less. The disclosure index measures the inclusion or omission of 90 items in the 1990 annual reports (LLSV, 1998). The average per-capita real GDP from 1993 to 1999 is extracted from the IFS database. ***, **, and * represent the significance at the 0.01, 0.05, and 0.10, respectively.

earnings management invalid. Once insiders learn that earnings management has no effect, they do less earnings management regardless of investor protections. Accordingly, the increase of the accounting disclosure index will increase the transparency of a company and hence reduce the incentive of a company's earnings management. Hence, some degree of opaqueness (lack of transparency) is essential for those insiders who want to conduct earnings management.

Table 7 provides the results of rank regressions of investor protection and earnings management to "avoid earnings decreases". First, the coefficients of the per-capita GDP are significantly negative, as shown in Eqs. (B), (D), and (F), representing the fact that a country's economic development will partially impact banks' incentives to manage earnings to exceed "zero earnings changes" thresholds.

Second, as shown in Eqs. (B)–(G), it is striking that the coefficients of legal enforcement are significantly positive, since the results are contrary to those found in Leuz et al. (2003), in which the financial institutions are deleted. Our results show that strong investor protection can encourage earnings management in the banking industry. Furthermore, since the coefficients of the interaction between per-capita GDP and legal enforcement are significantly negative (as shown in (C), (E), and (G)) strengthening investor protection seem to encourage earnings management more in low-income countries, relative to high-income countries.

Third, the coefficients of insider trading in Eqs. (D) and (E) and antidirector right across all equations are all insignificant, but those of the accounting disclosure index are still significantly negative, as in Eqs. (F) and (G), which suggests that stringent accounting disclosure requirements is also an effective tool to reduce banks' incentives to manage earnings to avoid "earnings decreases".

## 5. Conclusion

This paper finds that the distributions of banks' net income are half-normally distributed for more than two-thirds of the countries in our sample, suggesting the possibility of earnings management. We use three measures to assess the null of no earnings management. The three measures were originally developed for non-financial industries. Our results show that bank earnings management is common and indeed exists for nearly all of the sample countries regardless of the measures. Conflicting evidence, however, also exists. For example, using conventional measures, US banks show no sign of earnings management, yet earnings management seems to exist with respect to the distribution of banks' net income. Further research is needed.

Our results also demonstrate wide variation in the extent of the earnings management across countries. It appears to be strongly driven by the elements of prospect theory. Furthermore, we find that in order to weaken banks' incentives to manage earnings and thus improve the reliability of financial reports, stringent accounting disclosure requirements appear to be more effective than developing strong antidirector rights. But, it is striking that stricter law enforcement contrarily results in more

earnings management, since managers feel the need to avoid earnings decreases; thus possibly lowering the quality of financial reports of the banking industry.

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