Cross-country determinants of bank income smoothing by managing loan-loss provisions

Ana Rosa Fonseca* †
University of Oviedo
School of Economics and Business

Francisco González*
University of Oviedo
School of Economics and Business

Abstract

This paper studies the determinants of income smoothing by management of loan-loss provisions in banks around the world. Using a panel database of 3,221 bank-year observations from 40 countries and controlling for unobservable bank effects and for the endogeneity of explanatory variables, we find that bank income smoothing depends on investor protection, disclosure, regulation and supervision, financial structure, and financial development. Results suggest there is less bank income smoothing not only with the strength of investor protection, but also with the extent of accounting disclosure, restrictions on bank activities, and official and private supervision, while there is more income smoothing with market orientation and development of a country's financial system.

JEL classification: G34; G38; M41

Keywords: Income smoothing, loan-loss provisions, bank regulation, bank supervision, institutions.

*We thank Ana Isabel Fernández, Fernando Gascón, Víctor González, participants in the ACEDE Conference at La Laguna (2005), the AECA Conference at Oviedo (2005), and two anonymous referees for their helpful comments and suggestions. Financial support provided by the Spanish Education and Science Ministry–ERDF, Project SEC2006-15040 and by the Regional Government of Asturias, Project IB05-183, is gratefully acknowledged. This paper is based on a working paper written for FUNCAS (The Foundation of Spanish Savings Banks) and was awarded the 2005 Sanchís Alcover Award at the ACEDE Conference in La Laguna.

†Corresponding author: Ana Rosa Fonseca, Department of Business Administration and Accounting, University of Oviedo. Avenida del Cristo S/N, 33071. Oviedo. Spain. Tel.: +34-985103694. fax: +34-985103708. e-mail: arfon@uniovi.es.

Cross-country determinants of bank income smoothing by managing loan-loss provisions

Abstract

This paper studies the determinants of income smoothing by management of loan-loss provisions in banks around the world. Using a panel database of 3,221 bank-year observations from 40 countries and controlling for unobservable bank effects and for the endogeneity of explanatory variables, we find that bank income smoothing depends on investor protection, disclosure, regulation and supervision, financial structure, and financial development. Results suggest there is less bank income smoothing not only with the strength of investor protection, but also with the extent of accounting disclosure, restrictions on bank activities, and official and private supervision, while there is more income smoothing with market orientation and development of a country's financial system.

JEL classification: G34; G38; M41

Keywords: Income smoothing, loan-loss provisions, bank regulation, bank supervision, institutions.

1. Introduction

Bank income smoothing in the form of managing loan-loss provisions (LLP) varies from country-to-country depending on variables such as investor protection, disclosure, regulation, supervision, financial structure, and financial development. Ball, Kothari and Robin, (2000) and Fan and Wong (2002) highlight the role of regulation and legal enforcement in explaining international differences in the quality of financial statements. The institutional environment has a direct effect on earnings management according to Leuz, Nanda, and Wysocki (2003), who report differences in earnings management of publicly traded firms across 31 countries. They conclude that earnings management declines with investor protection; strong protection limits insiders' ability to acquire private control benefits, which diminishes the incentives to conceal a firm's performance.

We ask whether Leuz et al.'s findings (2003) on earnings management in the industrial firms are applicable to highly leveraged firms like banks. Our analysis uses a panel database of 3,221 bank-year observations to analyze the influence on income smoothing by managing LLP of investor protection, accounting disclosure, restrictions on bank activities, official and private supervision, and financial structure and development. We also compare income smoothing in publicly traded and non-publicly traded banks. We focus on bank manipulation of LLP because most of the empirical literature in banking has analyzed LLP for two basic reasons. First, banks have substantial latitude in determining the amount of provisions. Second, banks' high leverage makes them quite vulnerable to volatility in asset values, prompting adequate LLP, which become banks' main accrual; this has important effects on bank stability.

High leverage and the safety nets intended to avoid industry contagion in the event of a bank run give rise to the well-known moral hazard problem of risk-shifting. If there are greater incentives for bank insiders to shift risk, so too are there more incentives to engage in earnings management to hide their risk-shifting. Our primary hypothesis is therefore that the more efficient bank regulation and supervision proves to be in limiting bank risk, the fewer the incentives for bank managers to smooth bank earnings. This analysis is particularly relevant in the evaluation of the effect of the new Basel Capital Accord (Basel II) on the reliability of bank financial statements. Basel II emphasizes the strengthening of regulation (e.g. minimum regulatory capital requirements in Pillar 1) and of supervision by authorities (Pillar 2), as well as market discipline (Pillar 3) as tools to increase bank stability. The approach of the third Pillar of Basel II consists in strengthening market discipline by proposing a set of requirements and recommendations concerning public disclosure practices for banks. We provide new evidence on the effectiveness of the requirements set up in the third Pillar of Basel II by analyzing the impact of bank

disclosure on income smoothing. Additionally, when analyzing the influence of official supervision on income smoothing, we also provide evidence on the type of relationship (complements or substitutes?) between Pillar 2 and Pillar 3. For instance, if official supervision improves (worsens) the reliability of financial statements by reducing (increasing) income smoothing, it also strengthens (weakens) the effectiveness of market discipline mechanisms. In this case, Pillar 2 would complement Pillar 3."

Empirical analysis, by and large US-based, analyzes whether earnings before LLP have a positive coefficient. A positive coefficient would indicate income smoothing, since it suggests that LLP are high when earnings are high and low when bank earnings are low. Results are mixed for US banks. Greenawalt and Sinkey (1988), and Wahlen (1994), among others, find a positive relation between LLP and bank earnings; while Beatty, Chamberlain, and Magliolo (1995) and Ahmed, Takeda, and Thomas (1999) find no evidence of earnings smoothing. We extend the study of the LLP-earnings relationship to an international sample of banks by applying the GMM difference estimator to control for unobservable bank effects, and for the endogeneity of explanatory variables and the dynamic behavior of LLP. Our results indicate that better investor protection and stricter legal enforcement reduce incentives to smooth earnings in banking. Additional evidence shows that incentives to smooth earnings decline with accounting disclosure, restrictions on bank activities, and official and private supervision. Incentives increase with market orientation and development of a country's financial system.

Shen and Chich (2005) have also analyzed earnings management in an international bank sample. Their research is substantially different from ours in several ways. First, Shen and Chich look at earnings management in general, while we focus on the use of LLP, the main bank accrual, to smooth earnings. Second, we include in the analysis the influence of additional country variables, such as the exact nature of bank regulation and supervision as well as the structure and development of a country's financial system. Third, we analyze differences between publicly and non-publicly traded banks. Finally, we control for individual bank effects that are not explained by the variables explicitly included in the regressions and for the endogeneity of explanatory variables and the dynamic behavior of LLP.

The rest of the paper is structured in the following way. Section 2 discusses the hypotheses regarding the differences in income smoothing between publicly and non-publicly traded banks, and the cross-country determinants of income smoothing. Section 3 describes the database and methodology. Section 4 reports the empirical results of income smoothing in each country and the results of the cross-country determinants. Finally, Section 5 presents our conclusions.

2. Hypotheses

There are a number of reasons for income smoothing, most of which assume it has negative connotations. Income smoothing improves the risk perception of a bank for its investors, regulators, and supervisors. There may also be managerial self-interest to smooth earnings. Income smoothing may also be the result of perceived bankruptcy concerns and/or can be intended to discourage investors from acquiring private information that could then be used to trade against uninformed shareholders selling for liquidity reasons. These reasons imply that managers adjust earnings figures for subjective reasons, producing some kind of private control benefit for insiders that may ultimately diminish shareholder value (the *private-control-benefits* hypothesis).[1] However, analysis of the uses made of LLP to manage earnings must control for two alternative uses of LLP by bank managers and supervisors: the *risk-management* hypothesis and the *capital-management* hypothesis.

The risk-management hypothesis emphasizes supervisors' interest in reducing procyclicality of LLP and capital. It assumes that banks and regulators define a specific level of protection against credit losses and banks set aside loan-loss reserves according to the value of expected losses and raise capital according to unexpected losses. In other words, credit risk is built up in a boom and materializes in a downturn, so banks should recognize the underlying risk and build up loan-loss reserves in good times to be drawn on in bad times. As a result, provisions should therefore move with income (income-smoothing pattern) and with the economic cycle to return the ratio to its ideal (equilibrium) value every time it is modified by a random shock. Seen from this perspective, bank supervisors point out that the LLP-earnings link has a positive effect on banks, which clashes with the negative connotation suggested by the private-control-benefits hypothesis for income smoothing in the industrial sector.

However, empirical evidence fails to show any countercyclical behavior of LLP. Laeven and Majnoni (2003) and Bikker and Metzemakers (2005) have analyzed in an international sample of banks the relation between LLP and economic cycle using both earnings and GDP growth as explanatory variables. Although a positive coefficient for the earning variable is consistent with income smoothing, the research does not support the countercyclical view, as LLP are negatively related to GDP growth. Rather, both papers generally report procyclical behavior when running separate regressions for five regions and seven countries. Following these papers, we include the growth of per capita GDP as an explanatory variable to control for the potential countercyclical effect of LLP suggested by the risk-management hypothesis.

[1] See Goel and Thakor (2003) for a more detailed review.

The traditional capital-management hypothesis states that bank managers use LLP to reduce expected regulatory costs associated with violating capital requirements, a negative relationship being predicted between capital ratios and LLP (Ahmed et al., 1999). However, caution is called for in forecasting this for our sample for several reasons. First, the implementation of Basel I in our period of analysis reduced incentives for low-capital banks to increase LLP, given that provisions cannot be included in TIER 1 capital, and only general provisions can be included in TIER 2 capital and must comply with the 1.25 per cent limit. Second, although Basel I was in force in most countries, according to Barth, Caprio, and Levine (2004), countries altered and fine-tuned their definitions of regulatory capital, which could lead to differences across countries in the ability of LLP to manage capital and thereby disenable clear forecasting for the whole set of countries.[2] Such differences in capital regulation are not germane to our study as we are interested in analyzing the use of LLP to manage earnings after controlling for it being used to manage capital, but not in testing the capital-management hypothesis across countries. By including bank capital as an explanatory variable of LLP, without specifying a particular empirical relationship, we achieve this control.

2.1. *Publicly traded vs. non-publicly traded banks*

The literature has traditionally forecasted that publicly traded firms engage in more income smoothing. As publicly traded firms have more outsiders, earnings announcements and financial statements have a greater signaling effect (Beatty, Ke, and Petroni, 2002). Explanations of income smoothing based on managerial self-interest and on trading costs for uninformed shareholders would also suggest publicly traded firms have more incentives for income smoothing.

The opposite case can also be argued. Smaller banks, which are usually non-publicly traded enterprises, generally have fewer diversification opportunities. This could easily accentuate the risk-shifting conflict caused by high leverage and safety nets, thereby increasing the incentives to cover up risk shifting with more income smoothing. Moreover, if supervisors focus more on the bigger banks because they are so important in the case of a banking crisis, they would presumably be better able to understand the effects of accounting practices in publicly traded banks. This would reduce incentives to manage financial statements in publicly traded banks. Although the argument is not applicable to every country, differences across countries in official oversight of publicly and non-publicly traded banks would at least imply changing differences in income smoothing between these two groups of banks across countries.

[2] For instance, Shrieves and Dahl (2003) and Pérez, Salas and Saurina (2004) show differences in the treatment of LLP in the definitions of regulatory capital in Japan, Spain, and the US.

The contradictory predictions of hypotheses make differences in income smoothing between publicly and non-publicly traded banks an empirical issue, and banks may have different practices from those in the industrial sector. Only Beatty and Harris (1999) and Beatty et al. (2002) have shown that publicly traded banks engage in income smoothing more than privately owned banks in the US. To our knowledge, there is no empirical evidence on the differences in the use of LLP to smooth earnings between publicly traded and private banks outside the US; nor is there any empirical evidence on whether these differences are stable across countries.

2.2 Cross-country determinants of income smoothing

Possible cross-country determinants of income smoothing include: the influence of investor protection, transparency in accounting disclosures, bank regulation and supervision, and financial structure and financial development of a country. [3]

a) Investor protection

Investor protection is defined as the power to expropriate minority shareholders and creditors within the constraints imposed by law (La Porta, Lopez-de Silanes, Shleifer, and Vishny, 2002). We use three variables drawn from La Porta et al. (1998) to represent investor protection: rights of minority shareholders (ANTIDIRECTOR); creditor rights (CREDITOR); and legal enforcement (LEGAL). Higher values of these variables indicate stronger protection of minority shareholders and creditors and stronger legal enforcement.

Leuz et al. (2003) have shown that earnings management is more pervasive for commercial and industrial firms in countries where the legal protection of minority shareholders and legal enforcement are weak, because insiders enjoy greater private control benefits and hence have stronger incentives to obfuscate bank performance. In banking, there are additional arguments that would suggest investor protection would have a negative influence on income smoothing. Demirgüc-Kunt and Detragiache (2002) have shown that a sound legal system with proper enforcement of rules reduces the adverse effects of deposit insurance on bank risk-taking. This lower risk-taking in countries with strong institutional environments would also diminish bank incentives to smooth income which is stable *per se*. Shen and Chich (2005) report a negative relation in banking between the rights of the minority shareholders and earnings management, but do not find a negative influence for the quality of legal enforcement. Given these arguments, we expect ANTIDIRECTOR and

[3] Cavallo and Majnoni (2001) also uncover evidence of the influence of the legal and regulatory framework on LLP. Although their results can be interpreted as largely consistent with our evidence, they focus on the influence of institutional variables on the amount of provisions, while we focus on their influence on the relation between provisions and earnings.

LEGAL to have a negative influence on income smoothing. We also predict that CREDITOR will reduce income smoothing, as stronger creditor rights against borrower expropriation would reduce bank risk in lending activities and thus their incentives to smooth earnings.

b) Accounting quality

We forecast that a poor accounting system will increase bank income smoothing for two reasons. First, the less detailed financial statements are, the greater the opportunity to smooth profits reported to investors and supervisors. Second, a poor accounting system that makes it difficult for bank lenders to assess the total risk of borrowers will increase the problem of asymmetric information between them, thus increasing bank risk. Greater risk would create more incentives to smooth earnings.

The third Pillar of Basel II assumes that greater disclosure requirements are effective in strengthening market discipline. Our analysis provides evidence on this issue by directly testing whether greater disclosure increases the reliability of bank financial statements by reducing income smoothing. We use the accounting disclosure index (DISCLOSURE) from La Porta et al. (1998) as our indicator of accounting quality. This index measures the inclusion or the omission of 90 items in the 1990 annual reports, where higher values indicate more disclosure. Therefore, we expect DISCLOSURE to have a negative influence on income smoothing.

c) Bank regulation

We incorporate the characteristics of bank regulation in each country in the analysis through a measure of the breadth of activities permitted to banks (RESTRICT). There is no clear prediction for the effect of RESTRICT. On the one hand, tighter regulations on bank activities should reduce both opportunities for taking risk and bank competition (Claessens and Laeven, 2004). Reduced bank competition should lessen risk-taking incentives to preserve the higher charter value of banks in less competitive markets (Keeley, 1990). These arguments would suggest fewer incentives for income smoothing, the tighter regulations on bank activities. On the other hand, stricter limitations on bank activities may reduce the opportunities for smoothing earnings using other discretionary components of bank income such as security gains or losses (Beatty et al., 1995; Shrieves and Dahl, 2003). The fact that in this case there are fewer alternatives for smoothing earnings may mean that LLP are applied more often toward this end, in which case stricter regulations on bank activities would be positively related to income smoothing.

We use the measure of regulatory restrictions on non-traditional bank activities (securities, insurance, real estate, and bank ownership and control of nonfinancial firms) developed by Barth et al. (2001). Values range from 4 to 16; higher values indicate more restrictions on bank activities and nonfinancial ownership and control.

d) Bank supervision

We consider both official supervisory power (OFFICIAL) and private supervision (MONITOR) using the indicators developed by Barth et al. (2001). Official supervisory power, ranging from 0 to 14, captures the power of supervisors to take prompt corrective action, to restructure and reorganize troubled banks, and to declare a troubled bank insolvent. Private oversight, ranging from 0 to 6, measures the intensity of audit requirements and whether subordinated debt is allowable as a part of regulatory capital. Higher values of OFFICIAL and MONITOR indicate greater power of supervisors and greater private oversight.

If supervisors have greater powers to intervene in banks to discipline managers and reduce their incentives to undertake risk, they will also reduce managers' incentives to use LLP to smooth benefits that are not highly volatile. For this reason, we expect OFFICIAL to have a negative influence on income smoothing. As there are fewer opportunities for banks to smooth their earnings, with increased private monitoring, we expect MONITOR to have a negative influence on income smoothing.

e) Financial structure

We incorporate the influence of financial structure by analyzing the comparative importance of stock markets and banks in a country. The relation between financial structure and bank income smoothing may have a number of root causes. More dispersed bank ownership in market-oriented financial systems (La Porta, Lopez-de Silanes, and Shleifer, 1999; La Porta et al., 2002) may boost incentives for bank managers to smooth earnings, as the greater number of users of financial statements makes accounting figures more important and managers have more reasons to want to influence external perception of the bank's solvency. This argument predicts a positive influence of market orientation on bank income smoothing. The opposite prediction could be made if financial structure were considered an endogenous variable. The empirical literature has demonstrated that market-oriented financial systems are more likely to represent high-quality institutional environments with strong investor protection and good enforceability of contracts (La Porta et al., 1998). Considered in this light, market orientation, like investor protection, ought to be negatively related to income smoothing. However, this negative relation should

disappear when the potential endogeneity of financial structure is controlled for and only its exogenous component is considered.

We use the structure-aggregate variable (STRUCT) described by Beck and Levine (2002), defined as the first principal component of two variables that measure the comparative activity and size of markets and banks. Each of the components is constructed so that higher values indicate more market-oriented financial systems. The first component is the natural logarithm of the ratio of value traded to bank credit, and the second component equals the natural logarithm of the ratio of market capitalization to bank credit. The data to calculate this variable come from the Beck, Demirgüc-Kunt, and Levine (2003) database.

f) Financial development

As in the case of financial structure, we are unable to predict a clear influence of financial development on bank income smoothing. Again, more widely dispersed ownership in more financially developed countries increases the number of users of financial statements and gives bank managers incentives to improve the external perception of a bank's solvency by using income smoothing. However, if we assume financial development is an endogenous variable that increases with market orientation and strong investor protection (Levine, 1999), we would expect it to have the same negative influence on bank income smoothing as we investor protection, although the negative influence of financial development should disappear when its endogeneity is controlled for and only its exogenous component is analyzed.

We follow Beck and Levine (2002) and use a Finance-Aggregate index (FINAN) to gauge the extent of a country's financial development. This index equals the first principal component of two variables that measure the overall activity and size of financial intermediaries and markets, where higher values indicate a more developed financial system. The data to calculate this variable come from the Beck et al. (2003) database.

3. Bank data and methodology

We obtain consolidated bank balance-sheet and income-statement data (in US dollars and in real prices) from Fitch-IBCA Ltd. BankScope Database for 1995-2002. We use information for banks in 40 countries.[4]

[4] Our initial sample was made up of the 49 countries included in the La Porta et al. (1998) database for which information about legal characteristics and investor protection was available. Austria, Belgium, Finland, India, Indonesia, Netherlands, Taiwan, and Zimbabwe were excluded because of lack of data on macroeconomic or bank variables. Finally, we exclude US banks to avoid a potential bias caused by the high percentage that they represent of the sample (1,325 observations-29% of the sample).

3.1 Income smoothing

That it is important to use the right methodology to test the income-smoothing hypothesis is seen in the contradictory outcomes of the many US studies. We apply the generalized-method-of-moments (GMM) estimators developed for dynamic models of panel data by Arellano and Bond (1991). This methodology is designed specifically to address three relevant econometric issues: (i) the presence of unobserved bank-specific effects, which is eliminated by taking first-differences of all variables; (ii) the autoregressive process in the data regarding the behavior of LLP (i.e., the need to use a lagged dependent variables model to capture the dynamic nature of the LLP); and (iii) the likely endogeneity of the explanatory variables. The panel estimator controls for potential endogeneity by using instruments based on lagged values of the explanatory variables. Of the recent empirical studies, only Laeven and Majnoni (2003) in an international bank sample and Pérez et al. (2004) in a Spanish bank sample use this estimator.

The variables chosen as possibly explanatory of LLP are variables traditionally used for the income-smoothing hypothesis (see, for example, Greenawalt and Sinkey, 1988) and we incorporate additional variables to those employed in an international bank sample to analyze the procyclicality of bank provisioning (the risk-management hypothesis). Unlike Laeven and Majnoni (2003), we include bank capital to control for the capital-management hypothesis and country dummies to control for differences in the level of LLP across countries. Unlike both Laeven and Majnoni (2003) and Bikker and Metzemakers (2005), we include the loan-loss reserve to control for non-discretionary components of LLP. The model thus estimated is:

$$\left(\frac{\mathrm{LLP}_{i,t}}{\mathrm{A}_{i,t-1}}\right)=\beta_0+\beta_1\left(\frac{\mathrm{LLP}_{i,t-1}}{\mathrm{A}_{i,t-2}}\right)+\beta_2\left(\frac{\mathrm{LLP}_{i,t-2}}{\mathrm{A}_{i,t-3}}\right)+\beta_3\left(\frac{\mathrm{EBT}_{i,t}}{\mathrm{A}_{i,t-1}}\right)+\beta_4\left(\frac{\mathrm{CLOANS}_{i,t}}{\mathrm{A}_{i,t-1}}\right)+$$
$$+\beta_5\left(\frac{\mathrm{LLA}_{i,t-1}}{\mathrm{A}_{i,t-1}}\right)+\beta_6\left(\frac{\mathrm{CAP}_{i,t}}{\mathrm{RWA}_{i,t}}\right)+\beta_7\,\mathrm{GDPGR}+\beta_8\sum_{j=1}^{40}\mathrm{Country}_j+\beta_9\sum_{t=1995}^{2002}\mathrm{T}_t+\nu_i+\varepsilon_{it} \qquad [1]$$

where $LLP_{i,t}$ is the loan-loss provision of bank i at year t. Lags in the dependent variable ($LLP_{i,t-1}$ and $LLP_{i,t-2}$) capture adjustment costs that constrain complete adjustment to an equilibrium level. We include the first and the second lag to take into account a change in the speed of adjustment beyond the first year. We expect positive coefficients for the lags.

$EBT_{i,t}$, earnings before taxes and LLP, is the most interesting variable in our study, as it measures income smoothing; the higher its positive coefficient, the more income smoothing there will be. Change in total loans outstanding ($CLOANS_{i,t}$) and the beginning

balance of total allowance for loan losses ($LLP_{i,t}$) control for non-discretionary components of LLP, since these variables are related to changes in default risk. Following Greenawalt and Sinkey (1988), and Wahlen (1994), we expect positive coefficients for both variables.[5] All variables (LLP, EBT, CLOANS, and LLA) are normalized by the total bank assets at the beginning of year t ($A_{i,t-1}$) to mitigate potential estimation problems with heteroscedasticity.

We include the bank capital normalized by risk-weighted assets ($CAP_{i,t}/RWA_{i,t}$) to control for the potential use of capital management. We use TIER 2 in the reported results, though results do not change using TIER 1. The annual growth of real per capita GDP ($GDPGR_{i,t}$) is included to control for the documented procyclical effect of provisioning (Laeven and Majnoni, 2003; Bikker and Metzemakers, 2005). $\sum_{j=1}^{40} \text{Country}_j$ is a set of country dummy variables controlling for specific differences in the level of LLP across countries. $\sum_{t=1995}^{2002} T_t$ is a set of dummy time variables. These dummies capture any unobserved bank-invariant time effects not included in the regression. Finally, ν_i are unobservable bank-specific effects that are constant over time but vary across banks, while ε_{it} is the white-noise error term.

We control for the potential endogeneity of EBT, CLOANS, LLA, and CAP in the GMM estimations using two-to-four-period lags of the same variables as instruments. The growth of per capita GDP, the country and the time dummy variables are the only variables considered exogenous.[6] As the consistency of the GMM estimator depends on the validity of the instruments, we consider two specification tests suggested by Arellano and Bond (1991). The first is a Sargan test of over-identifying restrictions, which tests the overall validity of the instruments. This test confirms the absence of correlation between the instruments and the error term in our models. The second test examines the hypothesis of absence of second-order serial correlation in the first-difference residuals (m_2). In our models, this hypothesis of second-order serial correlation is always rejected. Although there is first-order serial correlation (m_1) in the differentiated residuals, it is due to first differences in models.

Table 1 reports descriptive statistics and correlations in our bank sample. The correlations in Panel B show that, on average, LLP correlates positively with bank earnings and the

[5] Results do not change when we include non-performing loans as an additional proxy for the non-discretionary components of LLP, but the smaller sample size due to missing data advises against reporting these results.

[6] Results do not vary by applying random-effect estimations. A random-effect estimation does not control for the potential endogeneity of explanatory variables or for adjustment costs. It has the advantage, however, of employing more observations and of also controlling for unobservable heterogeneity.

beginning balance of total allowance for loan loss, but correlates negatively with bank capital.

{INSERT TABLE 1 ABOUT HERE}

3.2 Cross-country determinants of income smoothing

To test the influence of country variables, we sequentially incorporate an interaction term for each country variable and the earnings variable into Equation [1]. The coefficient of each interaction term thus measures the influence of the particular political-economy variable on bank income smoothing. The paucity of instruments, the extensive number of country variables, and the need to use interaction terms with the earnings variable supports incorporation of the coefficients separately rather than at the same time.[7]

A major stumbling block when analysis includes several political-economy variables is separating out the effects and the correlated outcomes. The correlations between the political-economy variables in our sample in Table 2 corroborate the positive relations documented in the literature between LEGAL, STRUCT, and FINAN and also reveal that these three aspects correlate positively with DISCLOSURE. Such interrelations and the potential endogeneity of political-economy variables make it difficult to tease out the specific effect of each variable and to know which of them plays the major role in bank income smoothing.

Our empirical analysis uses a number of instruments for the observed values of each country variable to identify the exogenous component of the variable and control for potential simultaneity bias. The instruments are defined following Leuz et al. (2003): the country's real GDP averaged over 1980 to 1989, and four binary variables indicating English, German, French or Scandinavian legal origin according to the classification of La Porta et al. (1998). This methodology lets us to focus on the influence of the exogenous component of each political-economy variable. Thus correlations between the observed values for the political-economy variables need not remain when we analyze only their exogenous components.

{INSERT TABLE 2 ABOUT HERE}

[7] Barth et al. (2004) use a similar sequential procedure to analyze the influence of regulatory and supervisory practices on bank development.

4. Results

4.1 Results of income smoothing

Before analyzing differences across countries, we first test the income-smoothing hypothesis on the complete sample of banks. Results indicate income smoothing, as EBT has positive coefficients (statistically significant at the 1% level) in all estimations. Coefficients for the remaining variables are as expected; the two lags of the dependent variable have positive coefficients, indicating that a dynamic specification to model bank provisioning is recommended. The proxy variables for the non-discretionary components of LLP (CLOANS and LLA) have the expected positive coefficients. Capital has positive coefficients, contrary to the predictions of the capital-management hypothesis. Growth of real per capita GDP has negative coefficients, confirming the procyclical effect of LLP.

To analyze differences across countries, we estimate regression [1] for each country in the sample. Column 1 of Table 3 provides the EBT variable coefficients by country, which are a measure of bank income smoothing in each country. To save space, we report only countries with statistically significant coefficients. To compare the income smoothing of publicly and non-publicly traded banks, we incorporate into Equation [1] an interaction term of the earnings variable (EBT) and a dummy variable that takes the value of 1 if the bank was publicly traded and 0 otherwise (PT). Column 2 shows the coefficients of the PTxEBT interaction variable for each country. Since some countries have a limited number of publicly-traded banks, this coefficient cannot be calculated for Canada, Korea, New Zealand, Turkey, and Uruguay.

{INSERT TABLE 3 ABOUT HERE}

Our results confirm different patterns of income smoothing across countries. A positive relation between LLP and bank earnings in 13 countries (Brazil, Chile, Denmark, Egypt, Italy, Kenya, Korea, Peru, Philippines, Portugal, Spain, Sweden, and Venezuela) is consistent with the income-smoothing hypothesis. In Chile, Kenya, and Spain, income smoothing is detected only in publicly traded banks but not in non-publicly traded banks.[8] In 6 countries (Colombia, Greece, Malaysia, Pakistan, Thailand, and the United Kingdom) results contradict the income-smoothing hypothesis, with negatively related LLP and EBT. For Asian banks, Laeven and Majnoni (2003) find a significant negative association between earnings and provisioning. We find no statistically significant LLP-EBT relation in the remaining 21 countries.

[8] Interestingly, in Spain non-publicly traded banks do not seem to follow an income-smoothing pattern (GDP growth has a non-significant coefficient) even though the Bank of Spain in the mid-1990s introduced a requirement for procyclical provisions for reasons of risk management (the "statistical provision").

To compare income smoothing between developed and developing countries, we also estimate regression [1] in the complete sample of banks incorporating an interaction term of the earnings variable (EBT) with a dummy variable that takes the value of 1 for developed countries and 0 otherwise.[9] Although not reported, the negative coefficient of the interaction term is consistent with a lower income smoothing in developed countries.

Results also indicate that publicly traded banks engage in income smoothing more than non-publicly traded banks in 8 countries (Chile, Colombia, Egypt, Kenya, Peru, Portugal, Spain, and Thailand). In Greece and Italy, however, publicly traded banks smooth income less than non-publicly traded banks. Such a difference across countries suggests that more external users of publicly traded banks' financial statements fails to fully explain differences between publicly traded and non-publicly traded banks. We advise caution when interpreting these results, as eight years of data cannot do full justice to the measurement of income-smoothing patterns across economic cycles.

Differences across countries have two primary meanings. First, differences show how important it is to study national conditions that affect bank incentives to smooth earnings and obviate a common behavior pattern of provisioning. Second, they point to the bias of estimations using international data that fail to control for national variables that may influence bank manager incentives to smooth earnings.

4.2 Results of cross-country determinants

We report results using the GMM difference estimator with country and time dummy variables in Tables 4 and 5. Table 4 shows that legal variables measuring investor protection have the expected negative influence on bank income smoothing, as the EBTxLEGAL, EBTxANTIDIRECTOR, and EBTxCREDITOR coefficients are negative. Moreover, as real protection of shareholders and creditors depends not only on legally established rights but also on their enforcement, LEGAL may be seen as a complement of ANTIDIRECTOR and CREDITOR. To test this complementary effect, we interact LEGAL with ANTIDIRECTOR and CREDITOR, respectively, in columns 4 and 5. The negative coefficients of both interaction terms confirm the complementary nature of legal enforcement. This indicates that the greater the degree of law enforcement, the more investor protection reduces income smoothing. These results are consistent with those of Leuz et al. (2003) for industrial companies.

[9] We classify countries as developed or developing following the World Bank classification ("Beyond Economic Growth: An Introduction to Sustainable Development". World Bank Learning Resources Series, Second edition, 2004, Washington, D.C.). The countries for which our dummy variable takes the value 1 are Australia, Canada, Denmark, France, Germany, Hong Kong, Ireland, Israel, Italy, Japan, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland and United Kingdom.

The positive coefficients of LEGAL and ANTIDIRECTOR indicate that stronger minority shareholder protection and legal enforcement have a positive effect on the amount of LLP. The other variables mimic the coefficients observed when political-economy variables are not included; i.e., the two lags of LLP, CAP, CLOANS, and LLA have positive coefficients, and the growth of per capita GDP has negative coefficients.

{INSERT TABLE 4 ABOUT HERE}

Table 5 shows that better accounting disclosure, stricter regulations on bank activities, stricter official supervision, and more private monitoring reduce the use of LLP to smooth earnings. The negative influence of these four variables is consistent with expectations. The negative coefficient of EBTxDISCLOSURE suggests that stringent accounting disclosure requirements are effective in improving the reliability of financial reports and reducing income smoothing. The negative coefficients of EBTxOFFICIAL and EBTxMONITOR indicate that official and private supervision is effective in reducing bank risk, thereby dampening incentives for managers to smooth income to reduce the volatility of bank income. Finally, although we had forecasted contradictory effects for RESTRICT, its negative influence indicates that the lower risks of banks that target the credit and deposit markets reduce incentives to smooth earnings. Furthermore, this effect is greater than the effect of substitute accruals reduction, such as capital gains and losses, when banks are unable to operate in the securities, insurance, and real estate markets.

The positive coefficients of EBTxSTRUCT and EBTxFINAN, however, indicate that the exogenous components of market orientation and development of the financial system are positively associated with bank income smoothing. Greater income smoothing in market-oriented and more developed financial systems is consistent with the idea that bank managers have incentives to report more stable profits, the more external users of financial statements there are.[10] Results also highlight the limited economic significance of political-economy variables for LLP, despite statistically significant, except at the level of market orientation and financial development. For instance, using the coefficients of the interaction terms of Table 5, a standard increase in STRUCT and FINAN would result in an enhanced relation between EBT and LLP that represents, respectively, 0.5 and 1.12 times the standard deviation of LLP.

{INSERT TABLE 5 ABOUT HERE}

[10] When we control for the endogeneity of political-economy variables using legal origin as an instrument, we focus only on their exogenous component, isolating correlations caused by the legal origin of each country. Analysis of the exogenous component alone explains why STRUCT and FINAN have a different effect on income smoothing from LEGAL and DISCLOSURE, despite the correlations between the values observed for these four variables shown in Table 2.

Tests to control for a set of four macroeconomic variables (inflation, loan growth, GDP growth, and stock-market volatility) revealed no statistical significances, either as a group or individually including potential interactions with the earnings variable.

5. Conclusions

We have used a panel database of banks from 40 countries to analyze bank income smoothing by management of loan-loss provisions. We apply the GMM difference estimator to control for unobservable heterogeneity and potential endogeneity of the explanatory variables. Results indicate that neither income smoothing nor different income smoothing between publicly and non-publicly traded banks is stable across countries.

The root causes of differences in the pattern of income smoothing across countries are many and varied. When we sequentially incorporate potential country determinants into the GMM difference estimations, our results indicate that investor protection and legal enforcement reduce incentives to smooth earnings in banks. Incentives to smooth earnings decline with accounting disclosure, restrictions on bank activities, and official and private supervision; incentives increase with market orientation and development of the financial system.

The basic implications are that any bank regulation and supervision that reduces bank risk-taking will also diminish a bank's incentives to smooth earnings. Thus, stringent restrictions on bank activities that reduce opportunities to assume risks in undertaking non-traditional bank activities also diminish the benefits of managing earnings to reduce a volatility, which is low in the first place. This is a similar scenario to the income smoothing observed in countries with more stringent official and private bank supervision.

The place of banking regulation and supervision in explaining differences across countries in bank income smoothing is consistent with evidence that the financial statement reliability varies across countries. We expand this evidence to show that bank regulation and supervision, intended to enhance financial stability, also make financial statements more reliable. Our results support the usefulness of the new banking regulation contained in Basel II in strengthening market discipline, because not only greater disclosure requirements (Pillar 3) but also a more stringent official supervision (Pillar 2) reduces income smoothing and increases the reliability of a bank's financial statements. In this respect, Pillar 2 and Pillar 3 are complements in providing for stronger market discipline.

6. References

Ahmed, A.S., Takeda, D., Thomas, S., 1999. Bank LLP: A reexamination of capital management, earnings management and signaling effects. Journal of Accounting and Economics 28, 1-25.

Arellano, M., Bond, S., 1991. Some test of specification for panel data: Monte Carlo evidence and application to employment equations. Review of Economic Studies 58, 227-297.

Ball, R., Kothari, S., Robin, A., 2000. The effect of international institutional factors on properties of accounting earnings. Journal of Accounting Economics 29, 1-52.

Barth, J.R., Caprio, G., Levine, R., 2001. The regulation and supervision of banks around the world: A new database. World Bank Working Paper Nº 2588. The updated version is available at http://econ.worldbank.org.

Barth, J.R., Caprio, G., Levine, R., 2004. Bank regulation and supervision: What works best? Journal of Financial Intermediation 13, 205-248.

Beatty, A., Chamberlain, S., Magliolo, J., 1995. Managing financial reports of commercial banks: The influence of taxes, regulatory capital and earnings. Journal of Accounting Research 33, 231-262.

Beatty, A.L., Harris, D.H., 1999. The effects of taxes, agency cost and information asymmetry on earnings management: A comparison of public and private firms. Review of Accounting Studies 4, 299-326

Beatty, A., Ke, B., Petroni, K.R., 2002. Earnings management to avoid earnings declines across publicly and privately held banks. The Accounting Review 77, 547-570.

Beck, T., Levine, R., 2002. Industry growth and capital allocation: Does having a market- or bank-based system matter?. Journal of Financial Economics 64, 147-180.

Beck, T., Demirgüc-Kunt, A., Levine, R., 2003. Financial structure and economic development Database. World Bank, available at http://econ.worldbank.org.

Bikker, J.A., Metzemakers, P.A.J., 2005. Bank provisioning behaviour and procyclicality. Journal of International Financial Markets, Institutions and Money 15, 141-157.

Cavallo, M., Majnoni, G., 2001. Do banks provision for bad loans in good times. World Bank WP Nº 2619.

Claessens, S., Laeven, L., 2004. What drives bank competition? Some international evidence. Journal of Money, Credit and Banking 36, 585-592.

Demirgüc-Kunt, A., Detragiache, E., 2002. Does deposit insurance increase banking system stability? An empirical investigation. Journal of Monetary Economics 49, 1373-1406.

Fan, J., Wong, T., 2002. Corporate ownership structure and the informativeness of accounting earnings in East Asia. Journal of Accounting and Economics 33, 401-426.

Goel, A. M., Thakor, A., 2003. Why do firms smooth earnings?. Journal of Business 76, 151-192

Greenawalt, M.B., Sinkey, J.F., 1988. Bank loan-loss provisions and the income-smoothing hypothesis: An empirical analysis. Journal of Financial Services Research 1, 301-318.

Keeley , M.C., 1990. Deposit insurance, risk and market power in banking. American Economic Review 80, 1183-1200.

La Porta, R., Lopez-de Silanes, F., Shleifer, A., 1999. Corporate ownership around the world. Journal of Finance 52, 471-517.

La Porta, R., Lopez-de Silanes, F., Shleifer, A., Vishny, R.W., 1998. Law and finance. Journal of Political Economy 106, 1113-1155.

La Porta, R., Lopez-de Silanes, F., Shleifer, A., Vishny, R.W., 2002. Investor protection and corporate valuation. Journal of Finance 52, 1147-1170.

Laeven, L., Majnoni, G., 2003. Loan loss provisioning and economic slowdowns: Too much, too late?. Journal of Financial Intermediation 12, 178-197.

Leuz, Ch., Nanda, D., Wysocki, P., 2003. Earnings management and investor protection: An international comparison. Journal of Financial Economics 69, 505-527.

Levine, R., 1999. Law, finance and economic growth. Journal of Financial Intermediation 8, 8-35.

Pérez, D., Salas, V., Saurina, J., 2004. Principles versus rules and the definition of regulatory bank capital. Evidence from a unique environment. Mimeo, Bank of Spain.

Shen, C., Chich, H., 2005. Investor protection, prospect theory, and earnings management: an international comparison of the banking industry. Journal of Banking and Finance 29, 2675-2697.

Shrieves, R.E., Dahl, D., 2003. Discretionary accounting and the behavior of Japanese banks under financial duress. Journal of Banking and Finance 27, 1219-1243.

Wahlen, J.M., 1994. The nature of information in commercial bank loan loss disclosures. The Accounting Review 69, 455-478.

Table 1
Summary statistics

Panel A reports descriptive statistics. The bank sample consists of 1,213 banks in 40 countries. All data are in real US dollar prices and are reported on an annual basis over 1995-2002. LLP is the loan-loss provision, EBT is earnings before taxes and LLP, CLOANS is the change in total loans outstanding estimated as the difference of total bank loans between year t and year t-1, and LLA is the beginning balance of the total allowance for loan losses. All these variables are normalized by the total bank assets at the beginning of year t ($A_{i,t-1}$). CAP is bank capital divided by risk-weighted assets. *GDPGR* is the growth of real per capita GDP in the bank's country. Panel B reports the correlation matrix. *** and ** represent significance at the 1% and 5% level, respectively.

Panel A: Descriptive statistics

Country	Median LLP	Median EBT	Median CLOANS	Median LLA	Median CAP	Median GDPGR	# observations	# banks
Argentina	0.014	0.014	-0.002	0.028	0.241	0.240	158	58
Australia	0.016	0.013	0.071	0.001	0.070	6.225	87	26
Brazil	0.007	0.035	0.002	0.017	0.248	8.972	289	103
Canada	0.002	0.005	0.038	0.006	0.131	5.478	23	10
Chile	0.006	0.022	0.028	0.013	0.142	5.580	68	23
Colombia	0.014	0.023	-0.002	0.020	0.164	7.888	71	23
Denmark	0.003	0.013	0.031	0.019	0.064	3.474	66	38
Ecuador	0.013	0.024	-0.125	0.062	0.169	1.739	22	21
Egypt	0.009	0.025	0.026	0.062	0.141	7.028	97	27
France	0.003	0.012	0.025	0.028	0.080	4.040	340	117
Germany	0.003	0.006	-0.004	0.015	0.051	2.019	15	6
Greece	0.005	0.019	0.093	0.013	0.150	7.722	30	10
Hong Kong	0.004	0.019	0.002	0.012	0.217	-0.699	115	33
Ireland	0.001	0.015	0.053	0.007	0.066	14.637	33	11
Israel	0.004	0.012	0.047	0.019	0.075	8.808	47	13
Italy	0.040	0.015	0.054	0.016	0.108	4.539	251	90
Japan	0.003	0.004	-0.006	0.018	0.080	-0.551	115	102
Jordan	0.008	0.017	0.032	0.027	0.135	4.075	13	5
Kenya	0.013	0.034	-0.038	0.032	0.265	7.414	57	25
Korea	0.011	0.015	0.045	0.021	0.048	8.123	44	16
Malaysia	0.010	0.025	0.020	0.026	0.118	6.186	104	34
Mexico	0.005	0.015	0.017	0.017	0.190	6.140	72	29
New Zealand	0.001	0.018	0.088	0.003	0.052	5.140	26	7
Nigeria	0.015	0.062	0.085	0.044	0.278	15.307	88	34
Norway	0.003	0.013	0.066	0.014	0.074	8.913	35	10
Pakistan	0.004	0.021	0.119	0.024	0.111	8.550	74	21
Peru	0.018	0.026	0.068	0.037	0.125	5.875	50	18
Philippines	0.010	0.017	-0.009	0.030	0.118	11.045	72	22
Portugal	0.004	0.013	0.088	0.010	0.083	6.957	63	22
Singapore	0.002	0.016	0.027	0.038	0.170	2.407	27	11
South Africa	0.009	0.026	0.024	0.023	0.190	10.685	42	13
Spain	0.003	0.015	0.052	0.012	0.098	7.016	59	19
Sri Lanka	0.009	0.016	0.031	0.022	0.096	11.776	19	7
Sweden	0.0001	0.009	0.020	0.005	0.047	4.426	23	7
Switzerland	0.001	0.014	0.016	0.001	0.187	2.316	215	84
Thailand	0.008	0.004	-0.031	0.061	0.060	4.201	25	10
Turkey	0.003	0.026	0.004	0.010	0.154	18.415	12	10
United Kingdom	0.002	0.013	0.029	0.008	0.184	5.085	239	80
Uruguay	0.008	0.022	0.097	0.009	0.097	2.481	13	7
Venezuela	0.014	0.038	0.041	0.028	0.148	21.084	22	11
Mean	0.011	0.023	0.043	0.035	0.285	7.316		
Median	0.005	0.017	0.025	0.017	0.139	5.314		
Standard Deviation	0.041	0.054	0.216	0.220	1.158	18.547		

Panel B: Correlations

VARIABLES	LLP	EBT	CLOANS	LLA	CAP
LLP	1				
EBT	0.285***	1			
CLOANS	-0.017	0.086***	1		
LLA	0.664***	0.371***	-0.107***	1	
CAP	-0.044***	-0.029	-0.103***	-0.020	1
GDPGR	0.030	0.036**	0.019	0.018	-0.008

Table 2
Correlations of country variables

Values of ANTIDIRECTOR, CREDITOR, LEGAL, and DISCLOSURE are from La Porta et al. (1998). Values of RESTRICT, OFFICIAL, and MONITOR are from Barth et al. (2001). All these variables are measured at a specific point in time. In contrast, STRUCT and FINAN are calculated annually over 1995-2002 using the Beck et al. (2003) database. *** and ** represent significance at the 1% and 5% level, respectively.

	ANTIDIRECTOR	CREDITOR	LEGAL	DISCLOSURE	RESTRICT	OFFICIAL	MONITOR	STRUCT
ANTIDIRECTOR	1							
CREDITOR	0.114	1						
LEGAL	0.246	-0.052	1					
DISCLOSURE	0.435***	0.193	0.665***	1				
RESTRICT	-0.087	0.184	-0.368**	-0.160	1			
OFFICIAL	-0.098	0.056	-0.276	-0.396**	0.182	1		
MONITOR	0.184	0.070	0.498***	0.444***	-0.344**	-0.307	1	
STRUCT	0.340**	-0.128	0.416***	0.627***	-0.109	-0.158	0.212	1
FINAN	0.370**	0.038	0.663***	0.678***	-0.189	-0.130	0.425***	0.821***

Table 3
Income smoothing across countries

These results are for countries with statistically significant coefficients. The measure of income smoothing across countries shown in Column 1 is obtained using the Arellano and Bond (1991) GMM difference estimator for panel data with lagged dependent variables. In each country regression, the dependent variable is the ratio of LLP over lagged total assets. As explanatory variables, we include two lags of the dependent variable, profit before taxes and LLP over lagged total assets (EBT), the change in total loans outstanding over lagged total assets (CLOANS), the beginning balance of the total allowance for loan loss over lagged total assets (LLA), bank capital over risk-weighted assets (CAP), real growth in per capita GDP (GDPGR), bank-specific fixed effects, and year country dummies. The coefficient of EBT is the measure of income smoothing. Column 2 shows the coefficients of the interaction variable PTxEBT when this variable is added to the regression in Column 1; it captures the difference in the income smoothing between publicly and non-publicly traded banks. PT is a dummy variable that takes the value of one for publicly traded banks and zero otherwise. Regressions are estimated for each country for 1995-2002. Year dummy variables are included in all estimations, but are not reported. Coefficients for Argentina, Australia, Canada, Ecuador, France, Germany, Hong Kong, Ireland, Israel, Japan, Jordan, Mexico, New Zealand, Nigeria, Norway, Singapore, South Africa, Sri Lanka, Switzerland, Turkey, and Uruguay are not statistically significant and are not reported in the table. T-statistics are in parentheses. ***, **, and * represent significance at the 1%, 5%, and 10% level, respectively.

	Income smoothing	Sargan test	Difference between publicly and non-publicly traded banks	Sargan test	# observations	# banks
	(1)		(2)			
Brazil	0.1018*** (3.25)	90.10	0.1374 (0.74)	91.61	289	103
Chile	0.0516 (1.00)	58.23	0.5809** (2.01)	55.96	68	23
Colombia	-0.6804*** (-8.82)	60.78	0.8094*** (3.86)	58.59	71	23
Denmark	0.6138*** (4.47)	44.96	-0.5082 (-1.59)	57.13	66	38
Egypt	0.4347*** (6.58)	19.80	0.5585*** (4.79)	100.13	97	27
Greece	0.0386 (0.32)	21.51	-0.3069*** (-4.17)	30.45	30	10
Italy	0.0640** (2.12)	79.43	-0.1168** (-1.92)	72.99	251	90
Kenya	-0.1750 (-1.21)	47.03	0.5725* (1.79)	54.88	57	25
Korea	0.2582*** (2.82)	32.42	---	---	44	16
Malaysia	-0.3122** (-2.14)	81.17	0.2899 (0.35)	81.35	104	34
Pakistan	-0.1840** (-2.46)	53.54	0.0655 (0.44)	52.78	74	21
Peru	0.6300*** (4.72)	36.62	0.3074* (1.68)	37.72	50	18
Philippines	0.5237*** (5.46)	55.61	0.1924 (1.59)	53.48	72	22
Portugal	0.0675** (2.57)	68.63	0.2635** (2.00)	67.98	63	22
Spain	0.0250 (0.66)	47.40	0.1738** (2.20)	48.07	59	19
Sweden	0.3861* (1.72)	9.00	-0.1061 (-0.21)	8.29	23	7
Thailand	-2.4646** (-2.54)	14.30	3.4513*** (2.94)	13.39	25	10
United Kingdom	-0.1734*** (-3.56)	74.91	0.2787 (0.88)	70.47	239	80
Venezuela	0.4446*** (3.99)	11.88	0.3015 (1.46)	9.18	22	11

Table 4
Bank income smoothing and investor-protection variables

Regressions are estimated using the Arellano and Bond (1991) GMM difference estimator for panel data with lagged dependent variables. A dependent variable is the ratio of LLP over lagged total assets. As explanatory variables, we include two lags of the dependent variable, bank-specific fixed effects, year and country dummies. EBT is profit before taxes and LLP over lagged total assets. CLOANS is the change in total loans outstanding over lagged total assets. LLA is the beginning balance of the total allowance for loan loss over lagged total assets. CAP is bank capital over risk-weighted assets. GDPGR is real growth in per capita GDP. LEGAL is the measure of legal enforcement. ANTIDIRECTOR measures the protection of minority shareholders and CREDITOR measures creditor rights. Regressions are estimated for 1995-2002. Year and country dummy variables are included in all estimations, but are not reported. T-statistics are between parentheses. ***, **, and * represent significance at the 1%, 5%, and 10% level, respectively.

	Predicted sign	(1)	(2)	(3)	(4)	(5)
LLPt-1	+	0.0139*** (2.74)	0.0121** (2.34)	0.0159*** (3.23)	0.0158*** (3.19)	0.0187*** (3.93)
LLPt-2	+	0.0382*** (9.40)	0.0371*** (9.08)	0.0382*** (9.71)	0.0391*** (9.80)	0.0399*** (10.36)
EBT	+	0.0548*** (4.91)	0.0589*** (5.57)	0.0602*** (4.65)	0.0496*** (4.75)	0.0523*** (4.15)
CAP	+/-	0.0014*** (3.15)	0.0015*** (3.32)	0.0020*** (4.33)	0.0017*** (3.71)	0.0022*** (4.81)
CLOANS	+	0.0187*** (11.00)	0.0190*** (11.24)	0.0196*** (11.14)	0.0192*** (11.26)	0.0196*** (11.07)
LLA	+	0.0422*** (4.20)	0.0432*** (4.37)	0.0417*** (4.13)	0.0415*** (4.11)	0.0394*** (3.76)
GDPGR	-	-0.0001** (-1.96)	-0.0001* (-1.78)	-0.0001 (-1.31)	-0.0001* (-1.74)	-0.0001 (-1.29)
LEGAL		0.0003*** (3.89)			0.0002 (0.28)	0.0005** (2.13)
EBT x LEGAL	-	-0.0054*** (-3.51)				
ANTIDIRECTOR			0.0007*** (3.99)		0.0006** (2.14)	
EBT x ANTIDIRECTOR	-		-0.0150*** (-4.00)			
CREDITOR				-0.0009 (-0.89)		-0.0006 (-0.86)
EBT x CREDITOR	-			-0.0182*** (-2.79)		
EBT x LEGAL x ANTIDIRECTOR	-				-0.0017*** (-3.23)	
EBT x LEGAL x CREDITOR	-					-0.0020** (-2.15)
Year dummies		Yes	Yes	Yes	Yes	Yes
Country dummies		Yes	Yes	Yes	Yes	Yes
m_1		-2.13**	-2.13**	-2.14 **	-2.14**	-2.14**
m_2		0.74	0.75	0.75	0.73	0.74
Sargan Test		113.04	112.16	111.80	111.83	112.14
# observations		3,221	3,221	3,186	3,221	3,186
# banks		1,213	1,213	1,197	1,213	1,197
# countries		40	40	38	40	38

Table 5
Bank income smoothing and regulation and supervision

Regressions are estimated using the Arellano and Bond (1991) GMM difference estimator for panel data with lagged dependent variables. A dependent variable is the ratio of LLP over lagged total assets. As explanatory variables, we include two lags of the dependent variable, bank-specific fixed effects, year and country dummies. EBT is profit before taxes and LLP over lagged total assets. CLOANS is the change in total loans outstanding over lagged total assets. LLA is the beginning balance of the total allowance for loan loss over lagged total assets. CAP is bank capital over risk-weighted assets. GDPGR is real growth in per capita GDP. DISCLOSURE is the accounting disclosure index. RESTRICT is the measure of regulatory restrictions on bank activities, OFFICIAL measures the power of official bank supervision. MONITOR is an index of private bank monitoring. STRUCT measures the market-orientation of the financial system. FINAN measures the country's financial development. Regressions are estimated for 1995-2002. Year and country dummy variables are included in all estimations, but are not reported. T-statistics are between parentheses. ***, **, and * represent significance at the 1%, 5%, and 10% level, respectively.

	Predicted sign	(1)	(2)	(3)	(4)	(5)	(6)
LLPt-1	-	0.0128**	0.0074	0.0093*	0.0116**	0.0040	-0.0030
		(2.51)	(1.40)	(1.78)	(2.24)	(0.76)	(-0.57)
LLPt-2	+	0.0375***	0.0345***	0.0355***	0.0369***	0.0329***	0.0289***
		(9.22)	(8.34)	(8.66)	(8.99)	(8.01)	(7.08)
EBT	+	0.0573***	0.0708***	0.0654***	0.0609***	0.0910***	0.1083***
		(5.34)	(6.64)	(6.07)	(5.56)	(7.16)	(8.76)
CAP	+/-	0.0015***	0.0010**	0.0012***	0.0013***	0.0007*	0.0004
		(3.24)	(2.36)	(2.75)	(2.96)	(1.88)	(1.44)
CLOANS	+	0.0189***	0.0189***	0.0190***	0.0187***	0.0188***	0.0196***
		(11.19)	(11.52)	(11.46)	(11.15)	(11.02)	(11.63)
LLA	+	0.0427***	0.0482***	0.0468***	0.0436***	0.0536***	0.0641***
		(4.29)	(5.03)	(4.81)	(4.41)	(5.74)	(7.29)
GDPGR	-	-0.0001*	-0.0001***	-0.0001*	-0.0001*	-0.0002**	-0.0002**
		(-1.84)	(-1.89)	(-1.73)	(-1.90)	(-2.38)	(-2.42)
DISCLOSURE		0.00004***					
		(3.85)					
EBT x DISCLOSURE	-	-0.0007***					
		(-3.78)					
RESTRICT			0.0004***				
			(3.56)				
EBT x RESTRICT	+/-		-0.0058***				
			(-4.92)				
OFFICIAL				0.0003***			
				(3.55)			
EBT x OFFICIAL	-			-0.0045***			
				(-4.52)			
MONITOR					0.0005***		
					(3.82)		
EBT x MONITOR	-				-0.0085**		
					(-4.01)		
STRUCT						-0.0008*	
						(-0.77)	
EBT x STRUCT	+/-					0.0732***	
						(6.27)	
FINAN							0.0008*
							(-1.80)
EBT x FINAN	+/-						0.0465***
							(7.95)
Year dummies		Yes	Yes	Yes	Yes	Yes	Yes
Country dummies		Yes	Yes	Yes	Yes	Yes	Yes
m_1		-2.13**	-2.13**	-2.13***	-2.13***	-2.12**	-2.12**
m_2		0.74	0.77	0.76	0.75	0.78	0.83
Sargan Test		112.76	112.68	112.69	113.17	114.92	110.41
# observations		3,003	3,177	3,221	3,221	3,221	3,221
# banks		1,123	1,197	1,213	1,213	1,213	1,213
# countries		34	39	40	40	40	40