BOFIT Discussion Papers
19 • 2014

Yiwei Fang, Iftekhar Hasan and Lingxiang Li

Banking reform, risk-taking, and earnings quality – Evidence from transition countries

EUROJÄRJESTELMÄ
EUROSYSTEMET

Bank of Finland, BOFIT
Institute for Economies in Transition

BOFIT Discussion Papers
Editor-in-Chief Laura Solanko

BOFIT Discussion Papers 19/2014
2.12.2014

Yiwei Fang, Iftekhar Hasan and Lingxiang Li: Banking reform, risk-taking, and earnings quality – Evidence from transition countries

ISBN 978-952-323-003-3
ISSN 1456-5889 (online)

This paper can be downloaded without charge from http://www.bof.fi/bofit.

Suomen Pankki
Helsinki 2014

Contents

Abstract 4
1 Introduction 5
2 Literature review and hypotheses 9
2.1 Comparative analyses of earnings quality across countries 9
2.2 Risk-taking and earnings quality 13
3 Data sources and methodology 15
3.1 Bank-level data 15
3.2 Data on institutional developments 16
3.3 Empirical methodology on multivariate models 18
3.3.1 Earnings persistence and predictability of cash flows 18
3.3.2 Earnings smoothing using LLP and discretionary LLP 21
3.3.3 Small positive earnings 24
4 Results on multivariate models 27
4.1 Test for earnings persistence 28
4.1.1 Descriptive statistics 28
4.1.2 Multivariate results 30
4.2 Test for predictability of cash flows 32
4.3 Test for earnings smoothing using LLP 33
4.4 Test for *DLLP* 35
4.5 Test for small positive earnings 36
5 Univariate and non-parametric analyses 37
6 Conclusions 40
References 42
Tables and figures 47
Appendices 68

Yiwei Fang, Iftekhar Hasan and Lingxiang Li

Banking reform, risk-taking, and earnings quality − Evidence from transition countries

Abstract

The dynamic banking reforms of Central and Eastern Europe (CEE) following the collapse of the Soviet Union provide an ideal research setting for examining the causal effect of institutional development on financial reporting. Using five earnings quality measures, we consistently find that banking reform improves accounting quality and reduces earnings management incentives in the 16 transition countries considered. The results strongly hold in our within-country and difference-in-difference models, as well as in non-parametric analyses. We also find supporting evidence for the notion that excessive risk-taking of banks impairs earnings quality. As a result, banking reform improves earnings quality partially through its ability to curb risk-taking behavior.

JEL: G18, M41, M48, G38, E50, G15.
Keywords: earnings management, earnings quality, institutional development, bank risk-taking

Yiwei Fang, Stuart School of Business, Illinois Institute of Technology, 565 W. Adams Street, 4th Floor, Chicago, IL 60661. Email: yfang15@stuart.iit.edu.

Iftekhar Hasan, Fordham University and Bank of Finland, 5 Columbus Circle, 11th Floor, New York, NY 10019. Email: ihasan@fordham.edu.

Lingxiang Li, School of Business, State University of New York-Old Westbury, 223 Store Hill Rd, Old Westbury, NY 11568. Email: lil@oldwestbury.edu.

Note: Iftekhar Hasan serves as a scientific adviser to the Bank of Finland. Send all correspondence to Iftekhar Hasan, Fordham University, 5 Columbus Circle, 11th Floor, New York, NY 10019.
Email: ihasan@fordham.edu.

1 Introduction

A large body of literature attributes international differences in earnings quality to institutional factors (e.g. Ali and Hwang, 2000; Ball et al., 2000; Fan and Wong, 2002; Fonseca and Gonzalez, 2008; Francis and Wang, 2008; Haw et al., 2004; Kanagaretnam et al., 2014a; and Leuz et al., 2003). A consistent theme emerging from these cross-sectional analyses is that strong institutions (e.g. legal strength and investor protection) are typically associated with better earnings quality and less earnings management. The rationale is that strong institutions reduce managerial problems (e.g. acquisition of private-control-benefits) and consequently diminish incentives for managers to hide the true performance.

The stickiness of institutional factors, however, constrains these studies. Most of their sample countries are long-established market economies that have barely witnessed any significant changes to their legal institutions, economic status, political systems, and cultures over recent decades. Several studies remark on the challenge of establishing causal relationships in such cases (Djankov et al., 2007; Haselmann et al., 2010).

The ideal situation for showing causal effect would involve exogenous changes in the institutional environment and testing their impacts on financial reporting. We take advantage of an exogenous event, the collapse of the former Soviet Union, which gave rise to the rapid institutional development in the banking industry in Central and Eastern Europe (CEE). Compared with other mature market economies in the world, the institutional development of those transition countries all started from zero after the event. Every CEE country embarked on a journey of transformation, from a centrally planned economy to a market-based one, led by pressures from external organizations, including the European Union (EU), the European Bank for Reconstruction and Development (EBRD), and the United States Agency for International Development (USAID). Those exogenous variations in the timing and depth of the institutional development provide an ideal setting that overcomes the endogenous nature of institutional status quo in most studies (Haselmann et al., 2010).

As a further benefit, the CEE countries make a relatively homogeneous group in many aspects other than the focused institutional developments. This allows us to test in a clean and direct manner how institutional development affects bank earnings quality. Earlier studies generally compare earnings quality across countries with fundamental differences in customs, political systems, managerial demographics, location, historical back-

ground, etc.[1] When such variables are omitted or unobservable, the documented relationship between earnings quality and a certain institution factor (e.g. investor protection) can be spurious.

Banking reform is an important aspect of the efforts made by CEE countries to adopt a market-based economy. For these post-socialist countries, transformation in the banking industry was bound to be more drastic than in other industries. Manufacturing companies, say, could still produce roughly the same products, but banks had to go from acting as mere bookkeepers implementing the government's planned resource allocation to providers of modern banking services (Fries and Taci, 2005; Bailey, 1995). The ensuing overhaul of the banking systems involved three interrelated tasks: resolution of non-performing loans, privatization of ownership, and establishment of effective regulation and supervision. Each of these tasks calls for financial information quality absent in the planned economy. Accounting information is also supposed to gain more economic content from the new system: the monetary information flowing into the old-regime accounting systems is based on little more than centrally controlled (even contrived) commodity prices and thus lacks economic basis (Bailey 1995).

We focus on banks for five reasons:

(i) The transition countries in our sample have bank-based economies. Bank activities heavily influence growth of other businesses (Haselmann, 2009);

(ii) Both public and private commercial banks are required to disclose their financial data, usually according to the highest possible standards. The public disclosure requirement for banks lets us obtain a decent-sized sample not possible for any other industry in these countries;

(iii) Focusing on a single industry strengthens the comparability of earnings quality proxies across countries;

(iv) The great latitude given banks in determining the amount of loan-loss provisions, their largest accounting accrual, provides ample opportunities for earnings management; and

[1] The recent literature suggests cultural factors play an important role in a firm's financial reporting behavior (e.g. Han et al., 2010; Kanagaretnam et al., 2011 and 2014b; Nabar and Thai, 2007).

(v) The systemic importance of bank behavior (e.g. risk-taking and financial reporting), as highlighted by the recent meltdown of the US financial industry (Kanagaretnam et al. 2014a), is undisputed.

Given that the likelihood of a bank failure in a transition country is at least as great as in the industrial world (Honohan 2000) and that earnings quality potentially affects the crash risk of a bank (Cohen et al. 2014), we believe our study is timely and relevant.

We draw on the methodology of Haselmann et al. (2009) laid out in their comparative study of transition economies. It implements a difference-in-difference (DID) model and shows that improvement in legal systems, especially collateral laws, promotes bank lending. Fang et al. (2014) further apply the methodology to provide evidence that banks reduce risk-taking as a country improves creditor rights, reforms its banking industry, and strengthens corporate governance. Notably, banking reform is the dominant driver among the three factors. The effects of legal and governance reforms on bank risk critically depend on how much progress has been made in banking reform.

We employ reform indicators provided by the EBRD and the creditor rights index from Haselmann et al. (2010). We are wary, however, of the subjective term "earnings quality," which is contingent on the decision context (Dechow et al., 2010). To avoid chance findings, we borrow five earnings quality measures from various banking studies (e.g. Altamuro and Beatty, 2010; Ahmed et al., 1999; Kanagaretnam et al., 2014a), avoiding any subjective judgment as to whether a particular quality measure is better than another. These earnings quality measures are *cash flow predictability*, *earnings persistence*, loan-loss provisions (*LLP)-based earnings smoothing*, *earnings-inflating discretionary LLP* (*DLLP*), and *small positive profit*.[2]

Our samples are built on the bank-level financial and ownership data available in BankScope of Bureau van Dijk. We cover 16 CEE countries from 1997 to 2008. Sample size varies with earnings quality test, but stays between 783 and 1,289 (with the exception of our test of *DLLP*, where only 403 observations are available). All five tests consistently indicate that banking reform causes substantial improvement in earnings quality. Although we rely on multivariate analyses to generate this inference, our univariate and non-parametric analyses also firmly support the finding. The finding comports with the view

[2] Kanagaretnam et al. also use an earnings quality measure based on loan charge-offs. We have not included this measure here, however, due to the sparse reporting of loan charge-offs in our sample countries.

expressed in earlier studies that strong institutions are able to constrain managerial misbehavior (e.g. acquiring private control benefits) and, as a result, dampen incentives to hide actual performance through earnings management practices (Leuz. et al., 2003; Haw et al., 2004; Fonseca and González, 2008).

We are able to further incorporate within-country and DID models into our analyses. The within-country analysis removes the country-level difference in earnings quality and thus controls for the unobserved time-invariant country characteristics. More robustly, the DID model controls for average earnings quality in both country and time dimensions. Our results remain strong in both models. We also find a similar association between earnings quality and general *Corporate reform*, but not earnings quality and *Creditor rights*. In our transition countries, banking reform and general corporate reform typically progress hand in hand. We also ask whether corporate reform contributes to the improvement of bank earnings quality beyond the impact of banking reform. After excluding the portion of corporate reform parallel to banking reform, the above association between corporate reform and earnings quality no longer exists. The findings suggest that banking reform is the very process that directly improves bank earnings quality.

We further explore the relationship between banking reform and earnings quality from the perspective of the risk-taking behavior of banks. Following the literature, we compute the inverse Z-score to measure bank-level risk exposure. Our five tests all suggest that bank earnings quality decreases with risk exposure. These results serve as the empirical basis for the intuitive, but untested, prediction that banks manage earnings to hide their risk-taking activities (see Fonseca and González, 2008). More importantly, we find that risk-taking acts as a partial mediator, explaining about 20% of the documented impact of banking reform on earnings quality. Given the intrinsic difficulty of measuring risk-taking behaviors with bank-reported financial variables,[3] we qualitatively interpret the above results as evidence that reduction of risk-taking is an important tunnel (likely one of many) through which banking reform improves earnings quality. We then turn to the interplay between bank risk-taking and reforms. If *banking reform* and *risk-reduction* have a jointly diminishing marginal effect on improving earnings quality, we should observe a weaker effect of *banking reform* among banks that face fewer risk-taking issues, as well as a

[3] For example, we only observe "risk" levels based on post-earnings-management numbers. Given that high-risk firms manipulate earnings to disguise their risks, the actual association between earnings quality and bank risk should actually be *stronger* than what we observe in the bank-reported numbers.

weaker effect of risk-taking in country-years at high reform stage. We find strong empirical support for this conjecture.

With some wrinkles in the results, additional analyses reveal that bank characteristics such as capital level and ownership type can also affect earnings quality. Public status, however, does not seem to play a consistent or significant role.

Regarding the consequences of structural changes in transition economies, existing academic research (e.g. Brissimis et al., 2008; Fang et al., 2014; Haselmann, 2009), as well as government agency-affiliated projects (e.g. EBRD publications), have tended to focus on the real economic activities of banks such as expansion of bank loans, risk-taking behavior, capital structure decisions, and bank performance. Through studying the consequences of banking reform from the accounting perspective, we hope to deepen our understanding of bank risk exposure.

Transition economies have traditionally been omitted from cross-country research of earnings management. This study is a start at filling this void, and, more importantly, takes advantage of the exogenous collapse of the former Soviet Union, a natural experiment in our research design. The ensuing radical improvements in their banking systems make it possible for us to follow a DID approach and establish the causal link between institutional development and earnings quality.

The structure of the paper is as follows: Section 2 discusses related literature and constructs our four hypotheses. Section 3 outlines the models we use to capture bank earnings quality in relation to banking reform. Section 4 summarizes our empirical results separately for each test. Section 5 presents univariate and non-parametric analyses. Section 6 concludes.

2 Literature review and hypotheses

2.1 Comparative analyses of earnings quality across countries[4]

In their study of income properties in seven countries, Ball et al. (2000) predict that demand for accounting information varies across countries due to differing institutional con-

[4] While the self-serving earnings management of managers presumably erodes earnings quality, the term "earnings quality" is generally broader in scope than "earnings management" (see Dechow et al., 2010). For brevity, we use *earnings quality* as the collective term.

texts.[5] Their central insight is that accounting income in common-law countries is more timely than that in civil-law countries. They further attribute this difference to the more prompt recognition of economic losses (accounting conservatism) of common-law countries. Given that timeliness and conservatism reflect the transparency of financial statements (Ball et al. 2000), their finding is consistent with La Porta et al. (1998), who find that common-law countries offer stronger investor protections and legal systems than their civil-law counterparts.

The well-known study of Leuz et al. (2003) proposes that insiders use earnings management to hide and protect their private benefits of control. Therefore, earnings management is less likely to occur in countries with better investor protections, because strong protections limit the ability of insiders to acquire private control benefits. Their empirical findings support this prediction and suggest an endogenous link between corporate governance and earnings quality.[6] Focusing on the wedge between control rights and cash flow rights in nine East Asian and 13 Western European countries, Haw et al. (2004) find both legal institutions (as in Leuz et al.) and extra-legal institutions (e.g. competition laws, press diffusion, tax compliance) can curb income management. Lang et al. (2006) show that, compared with US firms, cross-listed non-US firms have smoother earnings, higher tendencies to report small positive earnings, lower earnings-price associations, and less timely recognition of losses. Moreover, cross-listed firms from countries with stronger institutions show less evidence of earnings management. Given that the US is on the strong end of the spectrum in terms of institutional development, these results are consistent with the findings of Leuz et al. (2003) and Haw et al. (2004). In an analysis of private and public firms in 13 EU countries, Burgstahler et al. (2006) document more earnings management in private firms and weaker legal systems. In addition, legal institutions and capital markets reinforce each other's impact on earnings management.

Fonseca and González (2008) test whether the findings of Leuz et al. (2003) apply to highly leveraged banks by focusing on how banks use loan-loss provisions (LLP) to smooth earnings. They note that LLP is typically a bank's largest accounting accrual, and the LLP amount is subject to managerial estimation. They show that the extent of LLP-

[5] Ball et al. (2000) also offer a less-detailed analysis of observations across eighteen other countries and find largely consistent results.

[6] They explain that it is likely an *endogenous relationship*, because investor protections are exogenously determined by the legal origins. Moreover, institutional factors are often complementary, making it nearly impossible in some cases to disentangle direct impact from total impact.

based income smoothing decreases in the face of increasing strength of investor protections and other institutional factors. They attribute this finding to the ability of institutional factors to alleviate the moral hazard problem of banks, and risk-taking in particular. Incentives to manipulate earnings are thus tamped down from the start. This observation of Fonseca and González may also explain why the literature finds little or mixed evidence of LLP-based income smoothing in the US (Beatty et al., 1995; Ahmed et al.,1999), a country with strong legal institutions.[7] In a related study, Kanagaretnam et al. (2014a) examine banks' earnings quality in relation to several institutional factors.[8] Compared with Fonseca and González (2008), Kanagaretnam et al. (2014a) test the relationship from the *information perspective* and *opportunistic perspective* using a much broader range of earnings quality proxies. The information perspective indicates that earnings quality increases with current earnings' predictive power for future earnings or cash flows. The opportunistic perspective suggests earnings quality decreases with increased managerial manipulation. Results based on proxies from both perspectives consistently imply higher earnings quality for countries with stronger legal, extra-legal, and political institutions.

In a nutshell, a consensus emerging from the above comparative studies is that *earnings quality is better in countries with stronger institutions*.[9] While none of the above studies cover transition economies, we expect the same relationship applies for banks in transition economies.

Typical examples of banking reform include interest-rate liberalization, establishment of prudential supervision and regulation, cultivation of well-functioning banking competition, as well as other measures to transform state-controlled banking systems into market-driven ones (EBRD, 2006). Our intuition here is that banking reform improves bank governance through strengthened supervision and regulation. In other words, banking reform reduces opportunistic behavior of managers, and (following the argument in Leuz et al., 2003) diminishes incentives for managers to hide their opportunistic behavior through earnings management.

[7] The Fonseca and González sample does not include observations from the US.
[8] Another cross-country study by the same authors (Kanagaretnam et al., 2014b) finds evidence that national culture, including individualism and conservatism, affects the accounting conservatism and risk-taking of banks.
[9] In their empirical analyses of banks across 48 countries, Shen and Chih (2005) provide opposite evidence: stronger enforcement of laws is associated with increased earnings management. However, they also find this effect is limited to low-income countries.

A bank behavior of particular interest is risk-taking that benefits equity holders at the expense of creditors (Fonseca and González, 2008). As Fang et al. (2014) show, bank risk-taking declines as banking reform advances. This can be interpreted as an example of improved internal governance due to banking reform.

Banking reform can also induce improvement in earnings quality from an information perspective. The privatization process embedded in the banking reform creates a demand for financial information that comes with stronger predicative power for future performance. This surge in demand for decision-useful information gives incentives for managers to supply it.

The above discussion overwhelmingly supports a positive effect of banking reform on earnings quality, which we state as the following hypothesis:

H1: Banking reform improves earnings quality.

To further examine whether banking reform is the major institutional factor related to bank earnings quality, we examine two related factors from Haselmann (2010) and Fang et al. (2014): *corporate reform* and *creditor rights*. In the absence of creditor rights, banks are reluctant to lend to firms unless they are highly confident of repayment (Pistor et al., 2000). Transition economies substantially improved their bankruptcy and collateral laws to encourage greater liquidity provision. Haselmann (2009) finds that the progress made in creditor rights has been successfully promoting bank lending. From the perspective of bank risk-taking, Fang et al. (2014) provide evidence that, in addition to *banking reform*, both *creditor rights* improvements and *corporate reform* help reduce firms' risk-taking. However, the effects from those two factors are critically dependent on the progress of banking reform. Banking reform's first-order impact likely reflects its more direct influence on the banking sector than *corporate reform* (which does not specifically target banks) and *laws of creditor rights* (which are put in place to protect banks rather than regulate them). Based on this rationale, we predict that these institutional factors have significantly less impact on earnings quality than banking reform.

2.2 Risk-taking and earnings quality

In view of the institutional failures starting from 2007, Kaplan (2011) encourages accounting academics to pay more attention to risk measures. Kanagaretnam et al. (2014b) show that national culture affects both financial reporting behaviors and bank risk-taking. Fang et al. (2014) also provide evidence that country characteristics influence bank risks. Therefore, we believe it is important to incorporate risk-taking into our cross-country analyses of banks' earnings quality, especially in light of the fact that excessive risk-taking is a typical moral hazard problem for banks.

The literature presents two views on the impact of banking reform on risk-taking. With respect to deposit-insurance-induced moral hazard, Keeley (1990) argues that deregulation increases competition among banks, which causes banks to take on asset with more risks and reduce capital infusions.[10] This mechanism helped drive the drastic increase in US bank failures in the early 1980s. Banking reform's risk-increasing effect is also evident to Dick (2006), who finds the credit portfolio risk of US banks increased following deregulation under the Riegle-Neal Interstate Banking and Branching Efficiency Act of 1994.

Alternatively, banking reform reduces bank risk through diversification and economies of scale (Claessens and Klingebiel, 2001), and through increasing the charter value of banks (Hellmann et al., 2000; Gonzalez, 2005). Recent empirical studies, including Barth et al. (2001, 2004) and Laeven and Levine (2009), provide results consistent with this alternative view. Fang et al. (2014) show CEE banking reforms reduced risk-taking. We therefore extend the analysis by asking how a bank's risk-taking behavior affects its earnings quality in our sample countries. Answering this question should reveal whether risk-reduction is included in the mechanisms through which banking reform improves earnings quality.

Banks with excessive risk exposure likely prefer opacity to transparency. In a theoretical model, Cordella and Yeyati (1997) demonstrate that the extent to which banks publicly disclose their activities is negatively related to their risk-taking. The underlying reason is that depositors might penalize the bank's excessive risk-taking if they had full knowledge of the bank's activities. Based on a study of banks in 27 countries, Bushman and Williams (2012) document that discretionary loan provision for earnings-smoothing

[10] Risk-taking is not always evidence of a moral hazard problem. Managers can take on risky, value-enhancing investments. Using a cross-country panel, John et al. (2008) find that both corporate risk-taking and firm growth rates increase with investor protection.

purpose inhibits external discipline over bank risk-taking. This is consistent with the argument that banks will hide excessive risk-taking in the opaque information environment created by intentional earnings manipulation. Under the assumption that earnings management impairs earnings quality, the above argument leads to our second hypothesis:

H2: Earnings quality of banks decreases with increased risk-taking.

We further explore the interactions between banks' risk-taking and banking reform. We make the following two related sets of alternative hypotheses. First, we want to examine whether banking reform affects earnings quality differently in banks with high and low risk-taking. Intuitively, banking reform should improve earnings quality more for high-risk banks, which are likely to already have managerial problems in place (Fonseca and González, 2008) and thus enjoy more room for improvement. This is very likely the case in transition countries that suffered from rampant nepotism and corruption, not to mention anecdotal evidence of risky lending by state-appointed bank managers to people with political or personal ties. Similar intuitions are offered in both Fang et al. (2014) and Haselmann et al. (2009). Fang et al. find that banking reform mainly improves the financial stability of domestic banks. They observe that domestic banks are less efficient to begin with and therefore stand to show greater absolute improvement over the course of banking reform. Haselmann et al. find that, in terms of lending volume, foreign banks respond more strongly to the advancement of creditor rights than domestic incumbents. They argue that, foreign banks entering the domestic loan market initially suffer from informational disadvantages, and thus stand to benefit most from the creation of a level playing field. This leads to our third hypothesis, which takes two forms:

H3(a): The impact of banking reform on earnings quality is more pronounced in high-risk banks than in low-risk banks.

Alternatively, the improvement in financial reporting may critically rely on a strong tone at the top. The aforementioned managerial problems in high-risk firms may prevent them from progressing in the transition process. Under this alternative view:

H3(b): *The* impact *of banking reform on earnings quality is less pronounced in high-risk banks than in low-risk banks.*

To fully investigate the interaction effect, we study whether the association between earnings quality and risk-taking depends on banking reform. Managers in countries with limited reform face less supervision over their financial reporting activities. Therefore, there is more freedom for them to "manage" accounting numbers in order to hide risk-taking behavior, resulting in a stronger association between earnings management and risk-taking. The contending argument is that financial disclosure of firms in poorly reformed countries is already quite opaque and thus requires no further earnings manipulation to disguise risk-taking.

Thus, our fourth hypothesis can be stated in mirror forms based on the above two views:

H4(a): The association between earnings quality and risk-taking is stronger in the early stages of banking reform.

H4(b): The association between earnings quality and risk-taking is weaker in the early stages of banking reform.

In summary, *H1* and *H2* predict that both banking reform and risk-reduction curb earnings management. *H3*(*a*) and *H4*(*b*) are consistent with the substitution effect between the two. *H3*(*b*) and *H4*(*b*) support complementarity.

3 Data sources and methodology

3.1 Bank-level data

Our primary data source for bank-year financial information is the *BankScope* database published by Bureau van Dyk. The full sample includes 434 commercial banks in 16 CEE countries: Albania, Bosnia-Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Macedonia, Montenegro, Poland, Romania, Serbia, Slovakia, and Slovenia. Our sample period runs from 1997 to 2008. Table 1 breaks down the number of observations by test, year, and country.

The overall risks of banks come from various sources, including (but not limited to) the mismatch between maturities and durations between assets and liabilities, operating uncertainties, economic downturns, political unrest, and policy changes. Our use of the term *risk-taking* here refers to risks banks assume through their operating activities. Our

bank risk measure is based on the Z-score used in Laeven and Levine (2009) and Kanagaretnam et al. (2014b):[11]

$$Z - score = (ROA + E/A)/\sigma(ROA) \quad (1)$$

where ROA is return on assets; E/A is equity-to-asset ratio; σ(ROA) is the standard deviation of ROA, computed over the three-year window [t-2,t] in a rolling fashion.[12] The Z-score measures the bank's distance to insolvency (Roy, 1952), with a higher value implying lower risk. Compared with risk measures that tend to focus on a single facet of risk such as *σ*(*ROA*), *non-performing loans*, and *equity-to-asset ratio*, the Z-score considers three factors (firm performance, capital adequacy, and risk assumed) in a single framework. This is important because some risks are justified by returns and capital-sufficient banks can absorb more asset risks. From this perspective, the Z-score captures the *excessive* risk-taking of managers better than other risk measures listed above. Following Laeven and Levine (2009), we take the natural logarithm of the Z-score to adjust for skewness. For convenience, we further multiply the log-transformed Z-score by negative one so that a higher value indicates more risk. Our final bank risk measure is as follows:

$$Bank\ Risk = -log_e\ (Z - Score) \quad (2)$$

3.2 Data on institutional developments

The EBRD reform indicators have been developed by research groups at the EBRD assessing and reporting on sectoral progress in CEE countries. Industrialized market economies are used as benchmarks to measure progress. These numerical structural indicators describe the year-end status of various reforms: *Enterprises*, *Markets and trade*, *The financial sector*, and *Infrastructure*.[13] Within the financial sector, two indexes are available: *banking reform* and *reform of non-bank financial institutions.* We use the former (*Banking*

[11] This is a standard measure of bank risk in the literature (e.g. Laeven and Levine, 2009; Houston et al., 2010).
[12] The rolling window may seem relatively short, giving cause for concern over measure reliability. However, due to the limited number of observations for each bank, we face the inevitable struggle between reliability of proxy and final sample size. The selected window (three years) as implemented in Fang et al. (2014) is a compromise we deliberately make in dealing with this dataset. Arguablely, a short window is appropriate for the rapidly changing banking landscape of transition economies. For robustness checks, we have also constructed a firm-level risk-taking measure. The results remain qualitatively similar.
[13] Given the inherent difficulties of quantifying institutional change, the EBRD also provides "transition development snapshots" to highlight qualitative or institutional developments in key economic areas.

reform) as our main variable. The value of this index ranges from 1, reflecting little progress beyond establishment of a two-tier system, to 4.3, reflecting full convergence of banking laws and regulations with Bank for International Settlements (BIS) standards. The EBRD index has been used in prior studies to measure the progress of banking reform (e.g. Brissimis et al., 2008; Koutsomanoli-Filippaki et al., 2009; Fang et al., 2014).[14]

To assess structural change in the corporate world, the EBRD provides three indexes under the category *Enterprises*. They are *small-scale privatization*, *large-scale privatization*, and *governance and enterprise restructuring*. The first two indexes capture the degree of privatization in large and small enterprises. The third captures the adoption of modern governance. These indexes are used in Zinnes et al. (2001) and Fang et al. (2014). Our measure *Corporate reform* is the average of the three. Because corporate loans make up a large portion of banks' outstanding loans, corporate reform can potentially affect bank stability through corporate borrowers. There might also be a spillover effect in company governance within the economy (Acharya and Volpin, 2010; Cheng, 2011; Dicks, 2012). If the governance improvement in the corporate world causes banks to follow suit, we would expect the earnings quality of banks to increase with corporate reform.[15] The extent to which this indirect mechanism influences the financial reporting of banks becomes an empirical question.

Following Haselmann et al. (2009), our measure *Creditor rights* includes both the protection of individual creditor claims outside bankruptcy (*Collateral*) and the collective enforcement the legal system offers for bankruptcy (*Bankruptcy*). *Collateral* pertains to the types of assets that can be pledged (e.g. land or personal property) and whether the registration system for moveable collaterals has been established. *Bankruptcy* assesses the laws in place that ensure an orderly liquidation process in the event of a bankruptcy. *Creditors rights*, the sum of *Collateral* and *Bankruptcy*, are taken from Pistor et al. (2000) for the earlier years in our observation period and further extended with the data from Haselmann (2009). The value ranges from 2 to 6, with a higher value indicating stronger creditor rights.

[14] The EBRD's Office of the Chief Economist assesses each country's progress in transition and reports the transition indicator. The broad categories of progress, from the least to the most, are given values 1, 2, 3, and 4. In addition, a "+" or "–" are added when the EBRD feels it necessary to adjust a full value. The EBRD treats a "+" as an addition of 0.33 and a "–" as a reduction of 0.33.

[15] Recall that our indicators *Banking reform* and *Corporate reform* are not exact counterparts. Therefore, spillover effects are not necessarily timely captured or even captured at all by the *Banking reform* indicator.

3.3 Empirical methodology on multivariate models

We test our hypotheses with the following five models: earnings persistence, predictability of cash flows, LLP-based earnings smoothing, discretionary LLP-based earnings smoothing, and small positive earnings.

3.3.1 Earnings persistence and predictability of cash flows

Earnings persistence measures how well bank-reported earnings are sustained from period to period. Under the assumption that persistent earnings provide better inputs to equity valuation models, a higher association between the future earnings and the current earnings indicates better earnings quality. To operationalize this notion of earnings quality, we follow Altamuro and Beatty (2010) and Kanagaretnam et al. (2014a) by estimating earnings persistence as the coefficient on current earnings in a regression of future earnings on current earnings:

Earnings Persistence (OLS)

$$EBT_{t+1} = \alpha_0 + \alpha_t + \alpha_j + \beta_1 EBT_t + \beta_2 Reform_{j,t} + \beta_3 Risk_{i,t} + \beta_4 Reform_{j,t} \times EBT_{i,t} + \beta_5 Risk_{i,t} \times EBT_{i,t} + \sum\beta(Bank\ variables)_{i,t} + \sum\beta(Macro.\ variables)_{j,t} + \varepsilon_{i,t},$$

(Baseline model) (3)

where subscripts *i*, *j*, and *t* index individual banks, countries, and years, respectively. The dependent variable is earnings before taxes (*EBT*) during year *t+1* scaled by total assets at the beginning of the year. Institutional reform (*Reform*) and bank risk (*Risk*) are our variables of interest. We use $Reform_{j,t} \times EBT_{i,t}$ *and* $Risk_{i,t} \times EBT_{i,t}$ to capture how institutional reform and bank risk-taking affect the persistence of earnings. To support *H1* and *H2*, β_4 and β_5 should be positive and negative, respectively. Overall earnings persistence is equal to $\beta_1 + \beta_4 Reform + \beta_4 Risk$. *Bank variables* in Eq. (3) include firm size (*SIZE*), computed as the log of total assets at the beginning of the year; standard deviation in ROA (*VOLATILITY*), i.e. the denominator of the *Z-score* from Eq. (1);[16] the deposit ratio (*DEPOSIT*), com-

[16] We control for σ(*ROA*) out of the following concern: the dependent variable in Eq. (3) and Eq. (5) measures performance in T+1 and may mechanically correlate with the volatility of prior performance σ(*ROA*). Without this control variable, however, our findings presented remain about the same.

puted as total deposits divided by total assets at the beginning of the year; the equity ratio (*CAPITAL*), computed as total equity divided by total assets at the beginning of the year; corporate loans (*CORP*), computed as corporate loans divided by total loans outstanding; short-term loans (*SHORT*), computed as short-term loans divided by total loans outstanding; and public status (*PUBLIC*), which is equal to one if the bank is listed on a stock exchange, and zero otherwise. Macroeconomic variables include bank crisis (*CRISIS*), which is equal to one if a country's banking sector becomes insolvent and could not operate without special assistance from supervisory authorities, and zero otherwise; inflation (*INFLTN*), which is the annual growth rate of consumer price index; deposit insurance (*DI*), which is equal to one when a country has explicit deposit insurance in a given year; and *GDP*, which is computed as the growth of GDP per capita in the current year (following Haselmann, 2009).

As elaborated in Haselmann (2009), the CEE countries offer two distinctive benefits that make the DID approach meaningful. First, our countries are similar along several critical dimensions (e.g. a common legacy of socialism, initiation of reforms in the early 1990s, and comparable economic conditions). Second, institutional reforms in these countries are exogenous, e.g. through multilateral and bilateral external agencies such as the EBRD, the World Bank, and USAID. To complete the DID model, Haselmann (2009) includes a full set of year effects (α_t) and country effects (α_j) that control for differences in the average value across years and countries.[17] This DID approach based on double fixed effects differs a bit from the typical DID estimator that is used in a setting with two groups (treated and control) and two time periods (before and after treatment). The fixed-effects-based DID estimator can be applied to a general setting with multiple groups in multiple periods.[18] Another notable example of using this approach is the analysis by Bertrand and Mullainathan (2003) of state adoption of anti-takeover laws at various times.

There is a major difference, however, between the model (Eq. (3)) we employ to explain the variation in *earnings persistence* and the models Haselmann (2009) and Fang et al. (2014) use to explain the variations in *lending volume* and *risk exposure*. Their de-

[17] By including country effects (α_j) into models (3) and (4), we do not further control those country-level characteristics in Kanagaretnam et al. (2014a) (e.g. BANKREG, OFFICIAL, MONITOR from Barth et al., 2001).

[18] Haselmann (2009) illustrates his DID approach with the following example. Assuming there are two countries in a research sample, A and B, both undergoing reform but at different points in time t=1 and t=2. Country B (country A) serves as the control group (treated group) in t=1 and as a treated group (control group) in t=2. When we extend this intuition to a research design with many countries, most countries belong to both the treated group and the control group but at different times.

pendent variables, i.e. *total loans* and *Z-score*, are already measures of lending volume and risk exposure, so they rely on the coefficient before *Reform* to test their hypotheses. However, the dependent variable in our Eq. (3), EBT_{t+1}, is not *earnings persistence* by itself. Instead, we rely on Eq. (3) to simultaneously estimate earnings persistence and the relationship between *persistence* and *Reform* (β_4). The country effects (α_j) and year effects (α_t) included in Eq. (3) only control for average EBT_{t+1} on country and year levels, not average persistence on those levels. To fully realize a DID approach, we instead control for average *earnings persistence* at the country level and year level with 15 country-EBT_t interaction terms and 11 year-EBT_t interaction terms:[19]

$$EBT_{t+1} = \alpha_0 + \sum \boldsymbol{\alpha_t} \times \mathbf{EBT_t} + \sum \boldsymbol{\alpha_j} \times \mathbf{EBT_t} + \beta_1 EBT_t + \beta_2 Reform_{j,t} + \beta_3 Risk_{i,t} + \beta_4 Reform_{j,t} \times EBT_{i,t} + \beta_5 Risk_{i,t} \times EBT_{i,t} + Controls\ in\ Eq.(3) + \varepsilon_{i,t},$$

(DID model) (4)

Since *earnings persistence* and its variation are jointly determined in the model, we are concerned that our limited sample size may not allow the above full-fledged DID model to reliably estimate *earnings persistence* for 15 countries and 12 years simultaneously. Therefore, we also run a within-country estimation that includes only the interactions between country dummies and EBT_t. This approach focuses on clearing up suspicions about endogeneity posed by unobserved country-specific characteristics (a challenge that cross-country studies constantly face).

The second earnings quality measurement we use is *predictability of cash flows*, which is related to, but distinct from, *earnings persistence*. A maintained assumption for using *earnings persistence* as a proxy for earnings quality is that persistent earnings are able to provide better inputs to a discounted-cash-flows (*DCF*)-based equity valuation model (Dechow et al., 2010).

We replace the accrual-basis earnings in Eq. (3) with cash-basis earnings to obtain the baseline model of Eq. (5) for *predictability of cash flows*. The corresponding DID model is based on the same approach mentioned above in Eq. (4). Kanagaretnam et al. (2014a) follow prior studies (e.g. Wahlen, 1994) in using earnings before taxes and loan

[19] Observations for *earnings persistence* come from 15 countries (zero observation from Montenegro) from 1997 to 2008 (12 years). Econometrically, we have to leave one group as the reference group. We can either create 15 country-EBT interactions along with 11 year-EBT interactions or 14 country-EBT interactions along with 12 year-EBT interactions. Also, the average earnings persistence in our sample is fully absorbed by those interaction terms. Therefore, $\beta_1 EBT_t$ is omitted from the DID model.

loss provisions (*EBTLLP*) as cash-basis earnings, under the rationale that *LLP* is the single largest accrual for banks.[20] We follow suit:

Predictability of Cash Flows (OLS)

$$EBTLLP_{t+1} = \alpha_0 + \alpha_t + \alpha_j + \beta_1 EBT_t + \beta_2 Reform_{j,t} + \beta_3 Risk_{i,t} + \beta_4 Reform_{j,t} \times EBT_{i,t} + \beta_5 Risk_{i,t} \times EBT_{i,t} + \sum\beta(Bank\ variables)_{i,t} + \sum\beta(Macro.\ variables)_{j,t} + \varepsilon_{i,t}$$

(Baseline model) (5)

Eq. (5) controls for the same sets of *Bank variables* and *Macroeconomic variables* as in Eq. (3).

3.3.2 Earnings smoothing using LLP and discretionary LLP

Earnings properties such as *earnings persistence* and *predictability of cash flows* are determined by accounting processes and fundamentals (Dechow et al., 2010).[21] Our next two earnings quality measures focus more on the accounting processes by directly targeting LLP, the largest accounting accrual for banks. The extent banks smooth earnings using LLP is first considered, then the magnitude of earnings-inflating *discretionary LLP*.[22]

LLP-based earnings smoothing shows up as a positive coefficient in a regression of *LLP* on *earnings before LLP*. The literature provides mixed or little evidence for the existence of such smoothing in the US. The findings in Greenawalt and Sinkey (1988) support its existence, while Ahmed et al. (1999), Beatty et al. (1995), and Moyer (1990) find no such evidence. There is, however, supporting evidence from other countries. Out of their large sample of banks from 40 countries, Fonseca and González (2008) find LLP-based earnings smoothing in 13 countries. They argue that strong investor protection constrains managerial misbehavior, which limits earnings smoothing activities, and they pro-

[20] To be consistent with *EBT*, *EBTLLP* is also scaled by beginning total assets.
[21] Graham and Dodd (1934) suggest that persistence is likely to be driven to a large extent by business fundamentals. This does not mean, however, that an ideal earnings quality measure should only capture the effect of accounting systems. Moreover, it has been shown that managers widely use real business activities to manage earnings (real earnings management, or REM) (see Roychowdhury, 2006; Gunny, 2010; Zang, 2012; Cohen and Zarowin, 2010) and in banks (see Ertan, 2013). Dechow et al. (2010) encourage distinguishing the relative contributions of fundamentals and accounting measurements on the persistence of earnings.
[22] While *earnings persistence* and *predictability of cash flows* speak to earnings quality, LLP choices capture earnings management. Earnings management, however, does not necessarily worsen earnings quality (Beatty and Harris, 1998).

vide strong evidence in support of the negative relationship between investor protection and earnings smoothing. Presumably, the privatization process in the banking reforms of transition countries improves protection for current and future bank shareholders. In this respect, the findings of Fonseca and González (2008) support our first hypothesis *H1*. However, their results also suggest that earnings smoothing increases with the overall activity and size of financial intermediaries in a country. As these measures capture the development of financial system, their result conflicts with the prediction of *H1*.[23] None of our transition countries are covered in their sample, which raises two questions.

- Do banks in our sample of CEE countries smooth earnings with LLP?
- How does income smoothing, if found to exist, vary with reforms and bank risk levels?

To answer the first question, we run the following model on the complete sample of banks.[24]

$$LLP_{i,t} = \alpha_0 + \alpha_t + \alpha_j + \beta_1 EBTLLP_{i,t} + \sum\beta(Bank\ variables)_{i,t} + \beta GDP_{j,t} + \varepsilon_{i,t} \qquad (6)$$

The dependent variable is scaled by total assets at the beginning of the year. We rely on the coefficient on *EBTLLP* (β_1) to examine the existence and extent of LLP-based earnings smoothing (a positive β_1 supports its existence). We include the following bank variables from LLP models in Fonseca and González (2008), Kanagaretnam et al. (2014a), and Ahmed et al. (1999) as controls: beginning loan loss allowance scaled by beginning assets (*BEGLLA*), total loans outstanding scaled by beginning assets (*LOANS*), change in total loans outstanding (*CHLOANS*), non-performing loans deflated by beginning total assets (*NPL*), the change in non-performing loans (*CHNPL*), loan categories (*CORP* and *SHORT*). These variables are intended to control for non-discretionary *LLP*.[25] The bank

[23] Their measure of the development of financial systems is the *overall activity and size of financial intermediaries and markets*. However, *Banking reform* in our study is not simply equal to the scale of financial markets.

[24] An ideal approach would be estimating the model in each country or even each country-year, but the small sample size in our study does not support this approach. However, we include country and year fixed effects to account for differences in mean *LLP*.

[25] *BEGLLA* is controlled in Fonseca and González (2008) (FG) and Kanagaretnam et al. (2014a) (KLL); *LOANS* is controlled in FG; *CHLOANS* is controlled in FG and KLL; *NPL* is controlled in KLL; *CHNPL* is controlled in Ahmed et al. (1999) (ATT); loan categories are controlled in KLL; *GDP* is controlled in FG. Since country fixed effects are controlled, we do not further control country-level time-invariant variables; e.g. capital ratio requirement (*CAPB*) controlled by ATT. We do not control stock-return-based measures;

risk-taking variable, *Risk*, is also included to capture the inherent correlation between business volatility and LLP recognition. We also include the variable GDP growth (*GDP*) to control for the previously documented pro-cyclical effect of LLP (Laeven and Majnoni, 2003; Fonseca and González, 2008).

To answer the second question, we interact *EBTLLP* separately with *Reform* and *Risk* in Eq. (7). As discussed earlier, our DID model includes 16 *country-EBTLLP*$_t$ interaction terms and 11 *year-EBTLLP*$_t$ interaction terms to control for the average *LLP-based earnings smoothing* on country level and year level. Similarly, the within-country estimation controls only for the 16 *country-EBTLLP*$_t$ interaction terms.

<u>*LLP-based Earnings Smoothing*</u> (OLS)

$$LLP_t = \alpha_0 + \alpha_t + \alpha_j + \beta_1 EBTLLP_t + \beta_2 Reform_{j,t} + \beta_3 Risk_{i,t} + \beta_4 Reform_{j,t} \times EBTLLP_{i,t} + \beta_5 Risk_{i,t} \times EBTLLP_{i,t} + \sum\beta(Bank\ variables)_{i,t} + \sum\beta(Macro.\ variables)_{j,t} + \varepsilon_{i,t}$$

(Baseline model) (7)

H1 and *H2* predict that β_4 will be negative and β_5 positive. *Income smoothing* includes both opportunistic behaviors and efficient decisions and thus has unclear impact on earnings quality. We follow the lead of Kanagaretnam et al. (2014a) and further examine earnings-inflating *LLP*, which is more likely the result of self-serving behavior of managers that undermines the quality of financial reporting. Using a two-stage approach, we first run model (6) on our whole sample. Residuals out of this estimation are regarded as *discretionary LLP* (*DLLP*). In the second stage, we test our hypotheses by examining the associations between the two variables of interest and the absolute value of negative *DLLP*. *H1* and *H2* suggest that the coefficients before *Reform* (β_1) and *Risk* (β_2) in Model (8) are negative and positive, respectively.

e.g. those controlled by ATT, including implied standard deviation of assets (*SDA*), annual returns (*Returns*), and *net returns*, as well as net loan charge-offs (*LCO* in KLL) due to the limited number of exchange-listed banks and missing values in our sample of transition countries. We control for (*1/total assets*) in the model since most variables in the model have been deflated by total assets. FG further uses two-period lag in *LLP* to capture (1) the adjustment costs that constrain complete adjustment to an equilibrium level, and (2) the speed of adjustment beyond the first year. We face the constraint that many observations will be dropped if we require the availability of LLP_{t-2}. Nevertheless, for robustness purposes, we include only LLP_{t-1} and the results do not change qualitatively.

Earnings-inflating Discretionary LLP (OLS)

$$|\mathrm{DLLP}|_{i,t} = \alpha_0 + \beta_1 Reform_{j,t} + \beta_2 Risk_{i,t} + \sum\beta(Bank\ variables)_{i,t} + \beta GDP + \varepsilon_{i,t}$$

(Baseline model) (8)

Based on a similar model in Kanagaretnam et al. (2014a), we include the following bank variables: firm size (*SIZE*), computed as the natural logarithm of beginning total assets; growth in size (*GROWTH*), which is equal to the ending balance of total assets divided by the beginning balance; LLP lagged by one period (*PASTLLP*), which is scaled by beginning total assets; and *EBTLLP*, *DEPOSIT*, and *PUBLIC* (introduced above). The estimation only includes observations with earnings-inflating *DLLP* (negative *DLLP*). Unlike models (3), (5), and (7), which simultaneously estimate earnings quality and its variation with *Banking reform* and *Risk*, Model (8) only estimates the variation in earnings quality with the two explanatory variables. Therefore, to realize a DID approach, we simply add the country and year dummies (α_t and α_j) into the model.

3.3.3 Small positive earnings

Hayn (1995) finds the "kink" in accounting earnings around the zero point, i.e. firm-years that report small profits greatly outnumber those that report small losses. Later studies suggest that firms avoid losses, as well as missing last years' earnings, by intentionally manipulating earnings (e.g. Burgstahler and Dichev, 1997; Beatty et al., 2002; Shen and Chih et al., 2005). The survey results in Graham et al. (2005) corroborate the view that managers will use accounting methods (and even real business operations) to avoid losses and meet past years' earnings.[26] Therefore, an earnings quality proxy based on small positive earnings or small increases in earnings capture both accounting and real earnings management.

The earnings quality measures *small profit* and *small increase in profit* are easy to compute, intuitively appealing, and supported by empirical and survey evidence. They are widely used in accounting studies to gauge the degree of earnings management. To establish their validity as earnings quality measures in transition countries, we first check

[26] Dechow et al. (2003) propose real activities management as an alternative explanation for the observed "kink" in earnings. Empirical evidence for benchmark-beating real activities is provided in e.g. Roychowdhury (2007) and Gunny (2010). A recent study by Ertan (2013) further shows that banks engage in real-activities-based earnings management through loan syndications.

whether our sample banks display asymmetric earnings distribution around the zero point. As detailed in the descriptive statistics (Appendix 4.1) and visually presented in Figure 1, we indeed find small profits "occurring" much more frequently than small losses. However, no such disparity is found between small profit increases and small profit decreases. We thus use small profit as our fifth earnings quality measure. A higher frequency indicates greater earnings management and worse earnings quality.

The likelihood of reporting small profit can be driven by the natural distribution of a firm's underlying performance instead of earnings manipulation: firms that frequently report small profit (ROA interval 1 in Figure 1) tend to frequently report ROA in nearby intervals as well (e.g. ROA intervals -4, -3, -2, -1, 2, 3, and 4).[27] Taking this into account, an ideal research design should adjust the likelihood of small profit by that of nearby control intervals. Leuz et al. (2003) have adjusted the *number of small profit* by *the number of small loss* on country-level. Similarly, Beatty et al. (2002) examine *small profit increases* relative to *small profit decreases*. However, *small loss observations* (the *ROA Interval -1* in Figure 1) cannot serve as a reliable adjustment in our analyses simply because there are too few in our sample (only 1 % of our already small sample). We bypass this constraint by using other nearby intervals as benchmarks. Specifically, as shown in Figure 1, the first benchmark group we use is *ROA interval 2*, which is to the immediate right of our suspect interval and makes up 8.7 % of our total sample. The second control group is much broader in scope, with ROA ranging from -0.01 to 0.01, excluding our suspect interval. The second group makes up 33.2 % of our sample.

We draw on the logistic models from Beatty et al. (2002) and Kanagaretnam et al. (2014a) to explain occurrences of small profit. In addition, to incorporate the adjustment for nearby-interval, we convert it into a multinomial logistic model to predict the likelihood that (i) ROA falls into the suspect interval (*outcome 1*) as opposed to the nearby control interval(s) and (ii) ROA falls into the non-suspect intervals (*outcome 2*) as opposed to the control interval(s). Our hypotheses predict that the *likelihood of (i)* decreases with banking reform and increases with risk-taking.

[27] We demonstrate this with the results (presented at the bottom of Appendix 4.1) from the following logistic regression: $Interval\ 1_t = \alpha_0 + \alpha_1\ Interval\ 1_{t-1} + \alpha_2\ Interval\ 2_{t-1} + \alpha_3\ Interval\ 3_{t-1} + \varepsilon$, where Intervals 1, 2, and 3 are indicator variables that equal to one when reported earnings fall in the following windows, respectively: [0,+0.25%], [+0.25%,+0.5%], and [+0.5%,+0.75%]. We use the current value for the dependent variable and one-period lagged values for independent variables.

We use two samples to analyze the issue. The *general sample* only requires the availability of current ROA and has 2,515 observations. The *final sample* further requires all control variables, including *Risk*, and the sample size drops to 1,201. Maximum likelihood estimation with logistic models is well-known to suffer small-sample biases, especially for rare events. This poses a problem for us because our sample is small and small positive earnings make up only 8 % of it. To avoid the loss of statistic power, *H1* is mainly tested in our *general sample* with the simple multinomial logistic regression of Eq. (9), accompanied by the corresponding within-country and DID specifications. *H2* is tested in our final sample with the full model, where *Risk* and control variables are all included, i.e. Eq. (10).

Small Profit (Multinomial Logistic)

$$\ln(\mathrm{P}_{\mathrm{i,t,m}}/\mathrm{P}_{\mathrm{i,t,0}}) = \alpha_{\mathrm{m}} + \beta_{1,\mathrm{m}} Reform_{j,t} + \varepsilon_{i,t}$$

(Baseline model for general sample) (9)

$$\ln(\mathrm{P}_{\mathrm{i,t,m}}/\mathrm{P}_{\mathrm{i,t,0}}) = \alpha_{\mathrm{m}} + \boldsymbol{\beta_{1,m}} Reform_{j,t} + \boldsymbol{\beta_{2,m}} Risk_{i,t} + \sum \beta_{3\sim 8,\mathrm{m}} (Bank\ variables)_{i,t} + \beta_{9,m} GDP + \varepsilon_{i,t},$$

(Baseline model for final sample) (10)

where *m* stands for the *outcome 1* and *outcome 2*. In our DID model, we include a full set of year effects ($\alpha_{t,m}$) and country effects ($\alpha_{j,m}$) into the above models. The coefficients of interest are $\beta_{1,1}$ on *Reform* and $\beta_{2,1}$ on *Risk*. A positive $\beta_{1,1}$, as predicted by *H1*, suggests that banking reform decreases banks' earnings management and, therefore, their likelihood of reporting small positive earnings; *H2* predicts a positive $\beta_{2,1}$.

We include the following variables as bank controls in Eq. (10): *SIZE*, *GROWTH*, *LOANS*, the change in cash flow earnings (*CHCFE*)[28] (also scaled by beginning total assets), *BEGLLA*, and *PUBLIC*. Moreover, we include *GDP* growth in our model to capture the impact of macroeconomic condition on the occurrences of *small profit*. We posit that when the economy is weak, staying profitable (at least in appearance) becomes a manag-

[28] Consistent with the practice in prior sections, cash flow earnings are *EBTLLP* scaled by total assets at the beginning of the current year.

er's top priority, and similarly, when the economy is robust, a zero or extremely small profit no longer meets market expectations. This conjecture indicates a countercyclical pattern in the occurrence of *small profits* (negative $\beta_{9,1}$). The following reason, which is unrelated to managerial manipulation, also suggests a negative $\beta_{9,1}$. Assuming the general distribution of corporate earnings is a smooth bell-like curve and ignoring the asymmetry around zero point for now, the zero point usually lies on the uphill side of this curve (see Figure 1 and the graphs in Dechow et al., 2003). As the economy improves, profits of all firms are expected to rise together, causing the curve to move right. This right shift in profitability distribution mechanically decreases the frequency at the zero point.[29]

4 Results on multivariate models

Among our sample countries, Croatia produces more observations than any other country, but the number does not appear to be large enough to dominate the empirical results. Table 1.1 presents the number of observations by country in each earnings quality test. Our main sample spans a 12-year period from 1997 to 2008. As presented in Table 1.2, there are less eligible bank-year observations in the earlier years. The sample size varies across earnings quality tests, with the test of *earnings persistence* having the largest sample (1,289).[30] The test of *DLLP* has only 403 observations mainly because the sample only includes observations with earnings-inflating *DLLP*. Since Fang et al. (2014) detail the yearly institutional changes for their sample countries and our main sample is extremely close to theirs, we do not further report these changes here.

The mean values of control variables vary slightly across five samples. We report the descriptive statistics for each in the tables and keep the related in-text discussion to a minimum.

[29] The inclusion of *GDP* in the model actually weakens our results in terms of their support for *H1* and *H2*. However, the strong significance of *GDP* in the model, along with the aforementioned arguments, warrants against omitting it from the model.

[30] The *general sample* for our test of small positive earnings has 2,515 observations.

4.1 Test for earnings persistence

4.1.1 Descriptive statistics

Table 2.1 describes the sample used for the test of *earnings persistence* (Sample I). There are 1,289 observations available for this test. *Corporate reform* and *Banking reform* are highly correlated, so we create *Corporate reform* (*r*) using a residual approach to capture its incremental effect on bank earnings quality.[31] *Risk* is the bank-year risk-taking measure as computed in Eq. (2). A higher value (less negative) of *Risk* indicates a higher level of risk-taking. As presented in our scatter plot (Figure 2), we see that country-years in lower reform stages tend to have more extreme values in *EBT*. If these values were due to measurement errors, the coefficient before EBT (β_4) would be attenuated in weak reform country-years, biasing the results toward supporting our *H1*. To eliminate this possibility, we winsorize 2 % of the variable at both ends.[32] As expected, most of those banks are highly leveraged, with a median (mean) *CAPITAL* ratio of 9.8% (12.6%). To put this value in perspective, Kanagaretnam et al. (2014a) report a median (mean) capital ratio of 7.1% (10.7%) for banks from 35 countries. While prior studies have documented accounting choices being made for capital management purposes in the US and elsewhere (see Ahmed et al., 1999; Fonseca and González, 2008), the slightly higher capital ratio in transition countries than in other countries suggests that capital management is less of a concern. The *DEPOSIT* ratio is on par with the one reported in Kanagaretnam et al. (2014a). Roughly 31% of our sample banks are publicly listed.[33] Some of our transition countries have experienced prolonged periods of high inflation. For example, Romania's inflation ran at above 30% from the start of our observation period to 2001. To address the potential link between inflation and firm performance, i.e. the dependent variables in Eq. (3) and (4), we include *INFLAT* in these two models.

The observations in Sample I have six distinctive values in *Banking reform*: 2.33, 2.67, 3, 3.33, 3.67, and 4, with 4 being the strongest. Accordingly, we divide the sample into six groups running from Stage 1 to Stage 6. Table 2.2 describes bank characteristics

[31] Specifically, we regress *Corporate reform* on *Banking reform* in our main sample and use the residuals as *Corporate Reform* (*r*). Since an intercept is included in the regression, *Corporate reform* (*r*) has a mean of zero in the general sample. However, as presented here, the mean is not exactly equal to zero in each specific sample.
[32] As expected, winsorizing at 1% or 0.5% marginally strengthens our results.
[33] Due to the limited data about stock returns in *DataStream*, computing stock-based earnings quality measures is challenging.

(mean value) at each stage. Moreover, we provide correlations between each bank characteristic and our two variables of interest: *Banking reform* and *Risk.* We compute and report at the bottom of the table the *raw earnings persistence* by reform stage. We use the term "raw" to emphasize that it is *not* obtained from our full-fledged model in Eq. (3). Instead, we run a simple regression of EBT_{t+1} on EBT_t (with an intercept) separately in each reform stage. The coefficient on EBT_t is our raw measure of earnings persistence, representing the association between future earnings and current earnings in each stage. When comparing the *raw persistence* values across reform stages, we notice a clear pattern of increasing persistence as we move up the reform ladder. This provides the initial evidence in support of *H1*.[34] However, due to their univariate nature, we caution against a literal interpretation of those results. Moreover, Stage 1 has only six observations, which may not do the full justice of measuring earnings persistence for that group.

The correlation between *Corporate reform* and *Banking reform* is 0.771, suggesting that the two transitions go hand in hand. As discussed above, *Corporate reform* (*r*) by construction has a zero correlation with *Banking reform.* We find that *Banking reform* is strongly and negatively related to *Bank risk*, consistent with the finding in Fang et al. (2014) that banking reform has a more direct role than corporate reform and creditor rights in reducing bank risk-taking. Bank size increases significantly with *Banking reform*, consistent with the rationale provided by Haselmann (2009). Since equity ratio is a part of the numerator of *Ln_Z*, there is a mechanical correlation between *CAPITAL* and *Risk* (-0.152). PUBLIC banks display less risk-taking behaviors, reflecting the market's disciplining role (Bushman and Williams, 2012). The negative correlation of *Banking reform* with *Inflation* (-0.290) indicates that the reform proceeds better in stable economies. *Risk* is shown to increase with *Inflation*, consistent with the intuition that banks are more likely to speculate when the economy is under inflation. As expected, there is a strong and positive correlation between *GDP* and *Banking reform*.

[34] We compute and report the raw persistence measure, instead of the full-model measure, for two reasons. First, we want to show that our results do not rely on a particular model. Second, the number of observations in each stage seems to be small, giving the cause for concern about whether a full model estimation (including the year and country fixed effects) is appropriate, especially for earlier reform stages.

4.1.2 Multivariate results

Testing H1 & H2 with Earnings Persistence

We report the results in Table 2.3. Consistent with the evidence for other countries (e.g. Kanagaretnam et al., 2014a; Altamuro and Beatty, 2010), banks have persistent earnings. The average persistence is 0.487 (β_1 in Column (1)).

We are interested here in how persistence varies with banking reform. The first coefficient of interest is thus β_4 before *EBT* × *Bank Reform*. It is consistently positive and significant in our baseline, within-country, and DID models, providing firm support for *H1*. The estimation reported in Column (1) shows the *total* effect of *Banking reform* on earnings quality. One level change in banking reform is associated with an increase of earnings persistence by as much as 0.261 (*p-value* < *0.0001*). The *T-statistics* reported are based on robust standard errors. We further separately cluster the standard errors by bank, year, and country. The significance drops by only small amounts. Using a bootstrap approach to estimate the distribution does little to change the above significance levels. We then incorporate the interaction *EBT* × *Risk* to test *H2*. *Risk's* negative association with persistence is strongly evident in all of our models, and is summarized in columns (3), (5), and (7). The baseline model shows that one standard deviation increase in *Risk* is associated with a decrease in earnings persistence of 0.181 (-0.153 (β_5) × 1.185 (*s.d.*)).

As expected, banking reform improves earnings quality in part by curbing banks' risk-taking. There is a roughly 30% drop in the magnitude of β_4 from Column (2) to (3), (4) to (5), and (6) to (7). The fact that β_4 remains significant in all those models after the inclusion of *EBT* × *Risk* suggests that risk-taking is only a partial mediator and that banking reform can affect earnings quality through other channels as well.

The *Adj*. R^2s are around 45%, somewhat lower than in studies of other countries (e.g. *Adj*. R^2s are around 60% in Kanagaretnam et al., 2014a). This reflects the general lower earnings quality in transition countries.[35] Most of the bank variables other than current earnings display weak predictive power for future earnings. The coefficient before *Size* is consistently positive, indicating that larger banks experienced better performance in transition countries. However, the economical magnitude of the impact is small.

[35] This could also be explained by differences in model specification.

We further analyze the impacts of other institutions on earnings quality by replacing *Banking reform* and *EBT* × *Bank Reform* in the above models with other reform variables and the corresponding interaction terms. Re-estimated results for *Corporate Reform*, *Corporate Reform* (*r*), and *Creditor rights* are reported in Table 2.3 panels B, C, and D, respectively. Results for controls variables are generally the same as those in Panel A and thus omitted from panels B to D. In all these re-estimations, *Risk* is consistently shown to be negative associated with earnings quality ($\beta_5 < 0$), as predicted in *H2*.

Corporate reform appears to improve *earnings persistence* significantly in all the three models. However, this is likely due to the significant correlation between *Corporate reform* and *Banking reform*. To examine whether corporate reform has any incremental impact on earnings quality, we rely on the measure *Corporate Reform* (*r*). As shown in Panel C, its impact is insignificant and turns negative in some specifications. Interestingly, we find that *Creditor rights* are negatively associated with earnings persistence, albeit with low significance. Transition countries have made continuous progress in all three spheres, but the above results strongly suggest that banking reform has the first-order importance in banks' earnings quality.

Testing H3 & H4 with Earnings Persistence

We split the sample into two equal sub-samples by the median of *Risk* (-3.319). The OLS regression we use is based on Model (3) but without the two interaction terms. We run the regression separately in the two sub-samples. Results are reported in Table 2.4 Panel A. First, earnings persistence is much lower in high-risk banks (0.412) than in low-risk banks (0.819), which is consistent with *H2*.[36] Then, to test *H3*, we add the interaction term *EBT* × *Reform* to the model and re-estimate it in the two sub-samples. While *Banking reform* improves earnings persistence in both, the impact is significant only among high-risk banks (compare columns (3) and (4)), which is in support of *H3*a. Results based on within-country estimators provide similar support. We run no further analyses with the DID model out of the concern that our sub-samples are too small to provide reliable estimates for a large amount of parameters at the same time.

[36] Note the large difference in *Adj. R^2* between the two sub-samples, with low-risk banks displaying a much better model fitness. This is consistent with the intuition that the performance of low-risk banks is easier to predict than the performance of high-risk banks.

We follow a similar procedure to test *H4*. Unlike the continuous variable *Risk*, the *Banking reform* indicator only has six distinct values in our sample (not evenly distributed). Therefore, the two subsamples are not exactly equal in size. In support of *H1*, high-reform country-years report much higher earnings persistence than their low-reform counterparts (0.710 compared to 0.413). While the coefficients before *EBT* × *Risk* are statistically significant in both sub-samples, the magnitude is twice as large in the low-reform sub-sample. The results are consistent with the substitution effects predicted by *H4*(a) that risk-taking is less of an issue when the country has reached an advanced reform stage.

4.2 Test for predictability of cash flows

The test of *cash flow predictability* resembles *earnings persistence* test in many respects. The sample (hereafter, Sample II) is largely the same as Sample I and described in Appendix 1.1. The appendix also reports each reform stage's *raw predictability for cash flows*. The computation is similar to that for *raw earnings persistence* in the above section.[37] The *predictability* is consistently higher in more advanced stages of *Banking reform*, providing the univariate support for *H1* (see Appendix 1.2). Note that *raw predictability* is negative -0.980 among the five observations in the first stage of banking reform. Removing them from our regression analyses barely changes any of the results presented below.

Table 3.1 reports the results from multivariate regressions. The baseline model without the interaction terms shows an average *predictability* level of 0.*434* (β_1 in Column (1)). The coefficient (β_4) before *EBT* × *Bank Reform* is consistently positive and significant, as predicted by *H1*. β_4 in Column (2) is the total effect of one level change in *Banking reform* on earnings quality. Column (3) uses the interaction *EBT* × *Risk* to test *H2*, while still keeping *EBT* × *Bank Reform* to examine the *direct effect* of banking reform on earnings quality. Compared with the earlier results for *earnings persistence* (summarized in Table 2.3), the results here provide even stronger support for both *H1* and *H2* in all the three models. The model fitness (*Adj.* R^2) is comparable in the two tables though. The results once again show that banking reform improves earnings quality partially through the reform's role in curbing risk-taking. The magnitude of β_4 drops by roughly 20% from Column (2) to (3), (4) to (5), and (6) to (7).

[37] Instead, we run a simple regression of $EBTLLP_{t+1}$ on EBT_t (with an intercept) within each group. The coefficient on EBT_t is our raw measure of *predictability of cash flows* for each reform stage.

Analyses of other reforms are presented in panels B to D. Consistent with results in the earlier section, *Corporate reform* seems to improve earnings quality initially (Panel B). Once stripped of its correlation with *Banking reform*, the impact of *Corporate reform* becomes insignificant and inconsistent. *Creditor rights* provide almost zero influence on *predictability* (Panel C). In support of *H2*, β_5 *a*re all negative and significant. Results presented in Table 3.2 are all consistent with expectations (*H3* and *H4*).

4.3 Test for earnings smoothing using LLP

We test *LLP-based earnings smoothing* in Sample III (see Appendix 2.1 for descriptives). The sample has 783 bank-year observations, smaller than the samples I and II. A simple comparison does not reveal significant differences across those samples in terms of bank characteristics. The drop in sample size is due to the requirement of extra loan-based variables in this test (e.g. *BEGLLA* and *NPL*), and the exclusion of bank-years that report losses (n=47). The survey by Graham et al. (2005) shows that when a firm is in financial distress, managerial efforts to survive the "tailspin" dominate those for financial reporting. As shown in our *non-parametric analyses* (Section V), the pattern of earnings smoothing is non-existent in the side of negative profit. Ktau and Spearman rank correlations actually suggest the existence of anti-smoothing for bank-years with losses. One explanation is that when losses are inevitable, banks engage in "big bath" accounting to boost their "profits" in future years.

LOANS are larger on average in more advanced reform stages (see Appendix 2.2), suggesting the increasing lending activities in the transition process (Haselmann, 2009). On the other hand, the decreasing trend of *LLP*, *BEGLLA*, and *NPL* portrays a favorable picture of banks' improved efficiency as transition proceeds. In the same appendix, we also report each group's *raw earnings smoothing*, estimated in a simple regression of *LLP* on *EBTLLP* (with an intercept) within each stage. The coefficient on *EBTLLP* is our raw measure of smoothing. This approach, however, does not control for the non-discretionary part of *LLP*. All *raw smoothing* values are positive, suggesting the strong existence of LLP-based earnings smoothing. The degree of smoothing is larger in earlier reform stages (e.g. β = 0.442 for Stage 2) and almost disappears by Stage 6 (β = 0.005). This also explains why prior studies have observed little evidence of LLP-based earnings smoothing in the US, where bank systems have long been well established. Our non-parametric analyses

(Section V) also provide univariate evidence in support of *H1* based on Δ*LLP* and Δ*EBTLLP*.

Before testing *H1* & *H2*, we first answer the question of whether earnings smoothing has a strong presence in transition countries after controlling for the non-discretionary part of *LLP*. Testing this provides the foothold for our further analyses of how smoothing varies with banking reform. As reported in Column (1) of Table 4.1, there is an extremely strong positive association between *pre-LLP performance* and *LLP* (0.261, with *p-value* < 0.0001) among banks that report profits.[38] Consistent with the above conjecture and the observation in the non-parametric analyses, loss-reporting banks actually display a certain degree of anti-smoothing as seen in Column (2).[39]

The coefficient of interest for *H1* is β_4 before *EBTLLP* × *Bank Reform*. It is negative and significant across all the three models, providing firm support for the hypothesis. β_4 in columns (3), (5), and (7) captures banking reform's *total* effect on *smoothing*. As predicted, the coefficient before *EBTLLP* × *Risk* (β_5) is positive and significant, meaning banks with more risk-taking engage in more earnings smoothing (*H2*). In agreement with our conjecture that banking reform affects earnings quality partially through its effect on risk-taking, we consistently see a drop in the magnitude of β_4 after including *EBTLLP* × *Risk* into the model. The magnitude drop ranges from 12% in the baseline model to 35.6% in the DID model. On average, the magnitude drop is relatively close to those observed in the earlier tests of *earnings persistence* and *predictability of cash flows.* The signs before *BEGLLA* are consistent with Kanagaretnam et al. (2010; 2014a) but not significant.[40] The only bank characteristic other than our variables of interest that displays consistent significant association with the dependent variable is *NPL*. The coefficient estimates stay between 0.149 and 0.182. These estimates are close to those of Kanagaretnam et al. (2014a).[41] Consistent with the study of US banks by Ahmed et al. (1999), *CHNPL* is positively associated with *LLP*, although not consistently significant across the three models. β_{14} before *GDP* is negative and significant, in line with the previously documented procyclical effect of *LLP* (Laeven and Majnoni, 2003; Fonseca and González, 2008).[42]

[38] Including loss bank-years into the sample decreases the *Adj.* R^2 by almost 10 %.
[39] Considering the limited degree of freedom, we do not control firm and year fixed effects in the regression analysis of loss observations.
[40] The negative association between *BEGLLA* and *LLP* reflects a mechanical association in accrual-basis accounting system, whereby a higher initial loan-loss reserve requires less LLP in the current period.
[41] Their coefficient estimate for *NPL* is 0.177.
[42] The coefficients appear as 0.000, because Table 4.1 reports results to three places after the decimal point.

Further analyses of *Corporate Reform*, *Corporate Reform* (*r*), and *Creditor rights* are reported in panels B, C, and D. For brevity, results for control variables are omitted from those tables. Corporate reform reduces earnings smoothing in the baseline and within-country models, but not in the DID model. Moreover, such associations dissipate when *Corporate reform* (*r*) is used instead. Improvement in *Creditor rights* does not appear to reduce earnings smoothing. In all these re-estimations, the positive coefficient on *EBTLLP* × *Risk* remains strong ($\beta_5 > 0$).

We report the results in Table 4.2 Panel A (for *H3*) and Panel B (for *H4*). Results in Panel A columns (1) and (2) show that LLP-based earnings-smoothing is stronger in high-risk banks (0.300 compared to 0.211). Panel B columns (1) and (2) document a stronger smoothing in the less reformed country-years (0.305 compared to 0.040). Both the baseline and the within-country models produce results that favor *H3*(a) and *H4*(a) over the two alternative hypotheses.

4.4 Test for *DLLP*

Given the decent model fitness of Eq. (6) (*Adj.* $R^2 = 0.494$), we use it to estimate the discretionary part of *LLP* (*DLLP*). Sample IV only includes bank-year observations with negative *DLLP* (earnings-inflating *DLLP*). We take the absolute value of *DLLP* (|*DLLP*|) and use it as the dependent variable. We face the constraint of small sample size in this test. Sample IV (described in Appendix 3.1) has 403 observations in five reform stages. We observe a consistent decrease in average |*DLLP*| from 0.0105 in *reform Stage 1* to 0.0032 in *reform Stage 4*.[43] The only break in pattern is from *Stage 4* to *Stage 5*, in which case |*DLLP*| slightly increases from 0.0032 to 0.0037.

The coefficient of interest in Table 5.1 Column (1) is β_1 on *Banking reform*. *H1* predicts $\beta_1 < 0$: banking reform reduces the magnitude of earnings-inflating DLLP. The results reported in Column (1) strongly support this prediction. A one-level jump in banking reform is associated with a decrease of earnings-inflating DLLP by 0.0034. To put this impact in perspective, 0.0034 is more than 50% of the mean value of |*DLLP*| in our sample. Results in Column (2) suggest that this strong effect from banking reform on earnings

[43] Since Sample IV does not have any observations when *Banking reform* is equal to 2.33, *Stage 1* in Appendix 3.2 is the equivalent of *Stage 2* in Table 2.2, and therefore we only have five instead of six reform stages in this table.

quality is partially mediated by the impact of *Bank risk* on earnings quality (β_2 = 0.0007). While the impact of *Banking reform* becomes statistically insignificant in our DID model, the sign is as predicted and the magnitude is certainly not small. *Creditor rights* has no impact on earnings quality (β_{10} *=0.0000* in Column (1)). We note that *Corporate reform* seems to have a strong effect on |*DLLP*| in Panel B, but, again, the effect dissipates once we remove the correlation of *Corporate reform* and *Banking reform* (Panel C).

We split the sample by the median of *Risk* (-3.427) and re-run the model separately in the two sub-samples. The results (reported in Table 5.2 Panel A) support *H3*(a) over *H3*(b). Banking reform consistently and strongly reduces |*DLLP*| in both groups but more so among high-risk banks. In support of *H4*(a), risk-taking causes the rise of |*DLLP*| more in the weak-reform sample (β_2 = 0.002, *T-stat.* = 2.628) than in the strong-reform sample (β_2 = 0.001, *T-stat.* = 1.644).

4.5 Test for small positive earnings

We use *small positive earnings* as an indicator of earnings management, based on an observation from the US of asymmetry around the zero point in banks' reported earnings.[44] Figure 1 notes the existence of such an asymmetry in our selected transition countries as well. The kink around the zero point in our group of transition countries is, in fact, more distinct than in the case of the US (as shown in Dechow et al., 2003). We use the ROA window [0, +0.25%] to identify the suspect interval (*Interval 1* in Figure 1). As discussed earlier, we have two reference groups based on the ROA intervals that are close to the suspect interval. After adjusting for the frequencies in the reference intervals, the likelihood of *small positive earnings* is smaller in higher reform stages (see Appendix 4.2). Kanagaretnam et al. (2014a) use small increase in profit (ΔROA as opposed to *ROA*) to identify suspected earnings management. However, we do not find in our data the existence of asymmetry around zero ΔROA. The ΔROA windows [0,+0.25%] and [-0.25%,0] produce almost the same number of observations: 13.0% and 13.4%. As a result, we do not think *small positive* ΔROA qualifies as an appropriate earnings management indicator for transition countries.

[44] Even though the asymmetry likely reflects managerial efforts to reach a target, it is debatable whether the efforts are self-serving or based on rationally efficient motives (Dechow et al., 2010).

The results from the simple multinomial logistic regressions are summarized in Table 6.1 Panel A. We are interested in the impact of *Banking reform* on the likelihood that ROA falls into the suspect interval (outcome 1) as opposed to the nearby reference interval(s) (outcome 0). For brevity, the results for the likelihood that ROA falls into a non-suspect interval (outcome 2) as opposed to the reference intervals are not presented. The results from all three models support *H1*.

Finally, we turn to a multivariate multinomial logistic regression to test *H2*. Our sample has a significant drop in size due to the missing values of control variables. As explained earlier, this brings a significant threat to the statistic power of our logit model. Nevertheless, *H2* is still strongly supported in all three models ($\beta_2 > 0$). However, the negative β_1 in columns (1), (3), and (5) is no longer statistically significant. In spite of the lack of significance, its drop in magnitude from columns (1) to (2), (3) to (4), and (5) to (6) is still consistent with the mediating effect of *risk taking.*

Consistent with our results from other tests, *Corporate Reform*, but not *Corporate Reform* (*r*), is negatively associated with the likelihood of small positive earnings. Further analyses show that the impact of *Banking reform* on earnings quality is stronger among high-risk banks, favoring *H3*(a), and that the impact of *Risk* is stronger in country-years with low banking reform, favoring *H4*(a).

5 Univariate and non-parametric analyses

To build more confidence into our main findings, we employ several non-parametric analyses to re-analyze our earnings quality measures. These analyses provide direct, visual impressions of the relationship between earnings quality and banking reform. Moreover, since we do not require control variables in these analyses, the samples better represent the true population than those of our regression analyses, eliminating the concern about sample selection biases.

Figure 2 plots future earnings against current earnings. To include all observations into the graph, we winsorize the variable *EBT*, 1 % at both ends. As shown in the scatter plots, current and future earnings become more closely related as we move from banking

reform *Stage 1* to *Stage 5*.[45] The Spearman rank correlation increases from 0.634 in Stage 1 to 0.800 in Stage 5. A similar pattern is found with K-tau rank correlation. In Figure 3, the *Spearman* (*K-tau*) rank correlation between future cash earnings and current accounting earnings, increases from 0.480 (0.361) in *Stage 1* to 0.673 (0.502) in *Stage 5*.

In Figure 4.1, we plot *LLP* against *EBTLLP* in an attempt to show the decrease of earnings smoothing with banking reform. We first visually detect an anti-smoothing phenomenon for bank-years with losses in general (downward slope). This is further confirmed by the negative *Spearman* (*K-tau*) rank correlation, -0.143 (-0.101), among the loss observations. To disentangle the earnings-smoothing effect, we plot the rest observations (positive-earnings) by reform stage. Quick visual inspection reveals that the obvious positive correlation between *LLP* and *EBTLLP* in *Stage 1* (upward slope) completely vanishes by Stage 5 (no clear slope). The *Spearman* (*K-tau*) rank correlation falls from 0.494 (0.349) in *Stage 1* to 0.235 (0.162) in *Stage 5.* The declining trend is not perfect, however, with Stage 2 (0.350 and 0.249) showing less smoothing than Stage 3 (0.477 and 0.336).

We further examine *LLP*-based earnings smoothing by looking into the signs of Δ*LLP* and Δ*PBTL*. *LLP* can smooth earnings when it changes in the same direction as *PBTL*. When Δ*LLP* and Δ*PBTL* are independent, there is 50% chance that the two have the same sign. Therefore, Figure 4.2 presents by reform stage the average likelihood that Δ*LLP* and Δ*PBTL* have the same sign, minus 50%. The results again suggest that no earnings smoothing exists in loss-reporting bank-years, even though no anti-smoothing is discovered either in Figure 4.2. For bank-years with profits, we find strong evidence of earnings smoothing in each reform stage, and, in support of *H1*, the smoothing decreases with banking reform.

Our test of *DLLP* follows Kanagaretnam et al. (2014a) and analyzes only earnings-inflating *DLLP*. The rationale here is that income-increasing earnings management indicates a more severe managerial problem than its income-decreasing counterpart. Figure 5 sheds light on this issue. We create three regions based on signed *DLLP*. The *earnings-inflating region* consists of bank-year observations with *DLLP* < -0.5%; the *earnings-deflating region* consists of bank-year observations with *DLLP* > +0.5%; and a middle *EM-free region*, named for its relatively small magnitude of *DLLP*. Consistent with *H1*, we

[45] Stage 1 here is equal to the combination of Stage 1 and 2 in our previous descriptive statistics (e.g. in Table 2.2); Stage 2 here is the counterpart of Stage 3 in prior sections; and so on so forth. This is done due to the extremely small number of observations in our original Stage 1.

find that country-years in the early reform stages (reform index ≤ 3) are more likely to have earnings-inflating *DLLP* than those in the middle stages (3 < reform index < 4), which, in turn are more likely than those in the final stage (index = 4). In contrast, the three have only small differences in earnings-deflating *DLLP*. Taken together, the results in the figure suggest that banks move from the earnings-inflating region into the *EM-free* region in response to banking reform.

To examine the frequency of suspicious small positive profit, we employ two non-parametric techniques. We use a histogram with an interval of 0.05% to show the actual frequency for each earnings window; and we rely on K-density estimation to draw the smoothed distribution in the graph. The area between the upper limit of each bar and the estimated probability line represents the true kink around zero earnings. As highlighted by the shaded areas, there is a much higher frequency of suspicious small positive earnings in early stages than in later stages.

To broaden our understanding of banks in transition countries, we further explore the roles of certain bank characteristics in earnings quality. Results are reported in Appendix 5. First, equity ratio is taken as an alternative measure of *Risk.* Following our prediction in *H2*, we expect banks with higher equity ratios to have better earnings quality as they have less risk to hide. Unlike the Z-score, however, *CAPITAL* captures more of the fundamental risk due to the capital structure than the intentional risk-taking on the part of managers. This may weaken the argument. The results in the tests of *persistence*, *predictability*, and *small positive profit* are strong and consistent with our conjecture.

Greenfield banks are those that are 100 % owned by foreign banks. Fang et al. (2014) find that they do not react to any reforms. This reflects their strong dependence on home countries, which are likely to have strong institutions already in place. Following this logic, we expect to see better earnings quality in *Greenfield* banks. We find that their earnings are generally more persistent, more able to predict future cash flows. They also have less LLP-based smoothing and lower degree of earnings-inflating *DLLP*. The only wrinkle in the results is seen in our test for *small positive profit*, where the impact is close to zero.

Majority-government-owned banks are likely the opposite of *Greenfield* banks. Simple intuition suggests that state banks are more likely to inherit the bureaucracy and corruption from the socialist regime and thus suffer severe managerial problems accordingly. Therefore, we expect such state-dominated banks to have worse earnings quality. Re-

sults based on *Persistence*, *Predictability*, and *Small positive earnings* strongly concur with this prediction. The two tests based on *LLP* and *DLLP* provide insignificant results.

Lastly, we ask if public status affects bank earnings quality. On one hand, the capital market may impose pressures on managers to report good-looking earnings, inducing "window dressing" behavior (Beatty et al., 2002). On the other hand, market monitoring and discipline may increase the cost of earnings manipulation (Burgstahler et al., 2006). Further, stock markets tend to reward qualities like *persistence* and *predictability*. However, none of our five tests give definitive results that would bolster either prediction. This is fairly in line with the mixed results of Fonseca and González (2008) for banks across many countries.

6 Conclusions

The banking systems of the post-Soviet states have witnessed sweeping reforms over the past two decades. The reforms created a two-tier banking system, liberalized interest rates, privatized state banks, and established effective regulation and supervision. Taking advantage of the exogenous nature of these institutional improvements, we examined how banking reform affects the earnings quality of banks in 16 of these transition countries. Our analyses employ five earnings quality measures: *earnings persistence*, *predictability of cash flows*, *LLP-based earnings smoothing*, *earnings-inflating discretionary LLP*, and *small positive profit*. Despite the relatively limited number of bank-year observations for our sample countries, our five tests consistently show that banking reform significantly improves banks' earnings quality. The results are statistically significant and economically strong. This finding is consistent with the argument that advanced institutions reduce managerial problems, thereby increasing the transparency of financial reporting. While our study belongs to the literature that investigates institutions' impacts on financial reporting, the unique research setting allows us to examine the issue with a DID model.

Earlier studies mostly focus on established market economies, where the current economic and legal institutions have long been in place. Moreover, recent research of banks in transition economies primarily looks at the influence of reforms on the actual operating decisions of banks. Our study, in contrast, reveals the positive impact of reforms from the financial reporting perspective. We believe that a more thorough understanding of financial reporting behavior is needed in transition economies, where capital markets are

still rapidly evolving. Moreover, a healthy financial reporting environment gives investors confidence that they can entrust capital to firms.

We also examined how the risk-taking behavior of banks affects their earnings quality. This line of inquiry serves two purposes. First, it offers empirical support for the argument that excessive risk-taking gives bank managers an incentive to manage earnings. Second, it demonstrates that the documented impact of banking reform on earnings quality is partially achieved through its ability to curb bank risk-taking. Bank regulators monitor the risk-taking of banks to prevent bank failures. Since the monitoring relies on financial reporting of those banks, our results suggest that earnings quality should be taken into account when implementing monitoring, especially for banks that already display excessive risk.

Given that *banking reform* and *reduction of risk-taking* can both limit managerial incentives to manipulate earnings, we further explored whether these two factors substitute or complement each other. Our results favor the substitution hypothesis. Specifically, we find that the impact of banking reform on earnings quality most strongly affects high-risk banks. The negative association between bank risk and earnings quality is more severe for country-years in lower reform stages. The policy implication of this result is that when the institutional environment is weak and changing remains difficult, directly controlling banks' risk-taking may prove effective in improving the quality of their financial reporting.

Finally, our results suggest that foreign banks in transition countries have high earnings quality, while majority-state-owned banks lean to the other end of the spectrum. Assuming there is a spillover effect in the good practice of financial reporting in transition countries, this result reinforces the importance of promoting foreign bank entry as an element of the banking reform process.

References

Acharya, V. V., & Volpin, P. F. (2010). Corporate governance externalities. *Review of Finance*, 14(1), 1–33.

Ahmed, A., Takeda, C., & Thomas, S. (1999). Bank loan loss provisions: a reexamination of capital management, earnings management and signaling effects. *Journal of Accounting and Economics*, 28, 1–25.

Ali, A., & Hwang, L. (2000). Country-specific factors related to financial reporting and the value relevance of accounting data. *Journal of Accounting Research*, 38(1), 1–21.

Altamuro, J., & Beatty, A. (2010). How does internal control regulation affect financial reporting? *Journal of Accounting and Economics*, 49(1–2), 58–74.

Bailey, D. (1995). Accounting in transition in the transitional economy. *European Accounting Review*, 595–623.

Ball, R., Kothari, S. P., & Robin, A. (2000). The effect of international institutional factors on properties of accounting earnings. *Journal of Accounting and Economics*, 29(1), 1–51.

Barth, J. R., Caprio, G., & Levine, R. (2001). The regulation and supervision of banks around the world: A new database. *Brookings-Wharton Papers on Financial Services*, 2001(1), 183–240.

Barth, J. R., Caprio, G., & Levine, R. (2004). Bank regulation and supervision: What works best? *Journal of Financial Intermediation*, 13(2), 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(2), 231–262.

Beatty, A., & Harris, D. G. (1999). The effects of taxes, agency costs 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. (2002). Earnings management to avoid earnings declines across publicly and privately held banks. *Accounting Review*, 77(3), 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.

Bertrand, M., & Mullainathan, S. (2003). Enjoying the quiet life? Corporate governance and managerial preferences. *Journal of Political Economy*, 111(5), 1043–1075.

Brissimis, S. N., Delis, M. D., & Papanikolaou, N. I. (2008). Exploring the nexus between banking sector reform and performance: Evidence from newly acceded EU countries. *Journal of Banking & Finance*, 32(12), 2674–2683.

Burgstahler, D. C., Hail, L., & Leuz, C. (2006). The importance of reporting incentives: Earnings management in European private and public firms. *Accounting Review*, 81(5), 983–1016. Burgstahler, D., & Dichev, I. (1997). Earnings management to avoid earnings decreases and losses. *Journal of Accounting and Economics*, 24(1), 99–126.

Bushman, R. M., & Williams, C. D. (2012). Accounting discretion, loan loss provisioning, and discipline of Banks' risk-taking. *Journal of Accounting and Economics*, 54(1), 1–18.

Carlin, W., Aghion, P., 1996. Restructuring outcomes and the evolution of ownership patterns in Central and Eastern Europe. *Lessons from the Economic Transition*, 241–261.

Cheng, I. (2011). Corporate governance spillovers. *SSRN Paper*, (April). Retrieved from http://webuser.bus.umich.edu/ingcheng /IngHaw_Cheng_JMP.pdf.

Claessens, S., Djankov, S., & Lang, L. (2000). The separation of ownership and control in East Asian corporations. *Journal of Financial Economics*, 58, 81–112.

Claessens, S., & Klingebiel, D. (2001). Scope of activities competition and services in financial services. *World Bank Research Observer*, 16(1), 19–40.

Cohen, L. J., Cornett, M. M., Marcus, A. J., & Tehranian, H. (2014). Bank earnings management and tail risk during the financial crisis. *Journal of Money, Credit and Banking*, 46, 171–197.

Cohen, D. A., & Zarowin, P. (2010). Accrual-based and real earnings management activities around seasoned equity offerings. *Journal of Accounting and Economics*, 50(1), 2–19.

Cordella, T., & Yeyati, E. (1997). Public disclosure and bank failures. *Staff Papers-International Monetary Fund.*

Dechow, P., Richardson, S. A., & Tuna, I. (2003). Why are earnings kinky? An examination of the earnings management explanation. *Review of Accounting Studies*, 8(2), 355–384.

Dechow, P. M., Ge, W., & Schrand, C. (2010). Understanding earnings quality: A review of the proxies, their determinants and their consequences. *Journal of Accounting and Economics*, 50(2–3), 344–401.

Dick, A. (2006). Nationwide branching and its impact on market structure, quality, and bank performance. *Journal of Business*, 79(2), 567–592.

Dicks, D. L. (2012). Executive compensation and the role for corporate governance regulation. *Review of Financial Studies*, 25(6), 1971–2004.

Djankov, S., Mcliesh, C., & Shleifer, A. (2007). Private credit in 129 countries. *Journal of Financial Economics*, 84(2), 299–329.

Dyck, A., & Zingales, L. (2004). Private benefits of control: An international comparison. *Journal of Finance*, 59(2), 537–600.

EBRD Transition Report (2006). *Finance in transition*. European Bank for Reconstruction and Development, London.

Ertan, A. (2013). Real earnings management in the financial industry. Working paper. Yale University.

Fan, J. PH., & Wong, T. (2002). Corporate ownership structure and the informativeness of accounting earnings in East Asia. *Journal of Accounting and Economics*, 33(3), 401–425.

Fang, Y., Hasan, I., & Marton, K. (2014). Institutional development and bank stability: Evidence from transition countries. *Journal of Banking & Finance*, 39, 160–176.

Fonseca, A. R., & González, F. (2008). Cross-country determinants of bank income smoothing by managing loan-loss provisions. *Journal of Banking & Finance*, 32(2), 217–228.

Francis, J. R., & Wang, D. (2008). The joint effect of investor protection and Big 4 audits on earnings quality around the world. *Contemporary Accounting Research*, 25(1), 157–91.

Fries, S., & Taci, A. (2005). Cost efficiency of banks in transition: Evidence from 289 banks in 15 post-communist countries. *Journal of Banking & Finance*, 29(1), 55–81.

Glaeser, E. L., La Porta, R., Lopez-de-Silanes, F., & Shleifer, A. (2004). Do institutions cause growth? *Journal of Economic Growth*, 9(3), 271–303.

González, F. (2005). Bank regulation and risk-taking incentives: An international comparison of bank risk. *Journal of Banking & Finance*, 29(5), 1153–1184.

Graham, J., Harvey, C., & Rajgopal, S. (2005). The economic implications of corporate financial reporting. *Journal of Accounting and Economics*, 40(1–3), 3–73.

Greenawalt, M., & Sinkey, J. S. (1988). Bank loan-loss provisions and the income-smoothing hypothesis: an empirical analysis, 1976–1984. *Journal of Financial Services Research*, 318, 301–318.

Grullon, G., & Michaely, R. (2007). Corporate payout policy and product market competition. *SSRN eLibrary*, (April).

Guadalupe, M., & Pérez-González, F. (2011). Competition and private benefits of control. *Working paper*.

Gunny, K. A. (2010). The relation between earnings management using real activities manipulation and future performance: Evidence from meeting earnings benchmarks. *Contemporary Accounting Research*, 27(3), 855–888.

Han, S., Kang, T., Salter, S., & Yoo, Y. K. (2010). A Cross-Country study on the effects of national culture on earnings management. *Journal of International Business Studies*, 41(1), 123–141.

Haselmann, R., Pistor, K., & Vig, V. (2010). How law affects lending. *Review of Financial Studies*, 23(2), 549–580.

Hart, O. D. (1983). The market mechanism as an incentive scheme. *Bell Journal of Economics*, 14(2), 366–382.

Hayn, C. (1995). The information content of losses. *Journal of Accounting and Economics*, 20, 125–153.

Haw, I.-M., Hu, B., Hwang, L.-S., & Wu, W. (2004). Ultimate ownership, income management, and legal and extra-legal institutions. *Journal of Accounting Research*, 42(2), 423–462.

Hellmann, T., Murdock, K., & Stiglitz, J. (2000). Liberalization, moral hazard in banking, and prudential regulation: Are capital requirements enough? *American Economic Review*, 90(1), 147–176.

Honohan, P. (2000). Banking system failures in developing and transition countries: Diagnosis and prediction. *Economic Notes*, 29(1), 83–109.

Houston, J. F., Lin, C., Lin, P., & Ma, Y. (2010). Creditor rights, information sharing, and bank risk taking. *Journal of Financial Economics*, 96(3), 485–512.

Kanagaretnam, K., Lim, C. Y., & Lobo, G. J. (2011). Effects of national culture on earnings management in banks. *Journal of International Business Studies*, 42(6), 853–874.

Kanagaretnam, K., Krishnan, G. V., & Lobo, G. J. (2010). An empirical analysis of auditor independence in the banking industry. *Accounting Review*, 85(6), 2011–2046.

Kanagaretnam, K., Lim, C. Y., & Lobo, G. J. (2014a). Effects of international institutional factors on earnings quality of banks. *Journal of Banking & Finance*, 39, 87–106.

Kanagaretnam, K., Lim, C. Y., & Lobo, G. J. (2014b). Influence of national culture on accounting conservatism and risk-taking in the banking industry. *Accounting Review*, 89(3), 1115–1149.

Kaplan, R. S. (2011). Accounting scholarship that advances professional knowledge and practice. *Accounting Review*, 86(2) 367–383.

Keeley, M. (1990). Deposit insurance, risk, and market power in banking. *American Economic Review*, 80(5), 1183–1200.

Kornai, J., Maskin, E., & Roland, G. (2003). Understanding the soft budget constraint. *Journal of Economic Literature*, 41(12), 1095–1136.

Koutsomanoli-Filippaki, A., Margaritis, D., & Staikouras, C. (2009). Efficiency and productivity growth in the banking industry of Central and Eastern Europe. *Journal of Banking & Finance*, 33(3), 557–567.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. W. (1998). Law and Finance. *Journal of Political Economy*, 106(6), 1113–1155.

Laeven, L., & Levine, R. (2009). Bank governance, regulation and risk taking. *Journal of Financial Economics*, 93(2), 259–275.

Laeven, L., & Majnoni, G. (2003). Loan loss provisioning and economic slowdowns: Too much, too late? *Journal of Financial Intermediation*, 12(2), 178–197.

Lang, M., Smithraedy, J., & Wilson, W. (2006). Earnings management and cross listing: Are reconciled earnings comparable to US earnings? *Journal of Accounting and Economics*, 42(1–2), 255–283.

Leuz, C., Nanda, D., & Wysocki, P. D. (2003). Earnings management and investor protection: An international comparison. *Journal of Financial Economics*, 69(3), 505–527.

Moyer, S. (1990). Capital adequacy ratio regulations and accounting choices in commercial banks. *Journal of Accounting and Economics*, 13, 123–154.

Nabar, S., & Thai, B. (2007). Earnings management, investor protection, and national culture. *Journal of International Accounting Research*, 60(1), 61–74.

Nichols, D. C., Wahlen, J. M., & Wieland M. M. (2008). Publicly traded versus privately held: Implications for conditional conservatism in bank accounting. *Review of Accounting Studies*, 14(1), 88–122.

Pistor, K., Raiser, M., & Gelfer, S. (2000). Law and finance in transition. *Economics of Transition*, 8(2), 325–368.

Porta, R. (1999). Corporate ownership around the world. *Journal of Finance*, 54(2), 471–517.

Roychowdhury, S. (2006). Earnings management through real activities manipulation. *Journal of Accounting and Economics*, 42(3), 335–370.

Shen, C., & Chih, H. (2005). Investor protection, prospect theory, and earnings management: An international comparison of the banking industry. *Journal of Banking & Finance*, 29(10), 2675–2697.

Shleifer, A. (2004). Does competition destroy ethical behavior? *American Economic Review*, 94(2), 414–418.

Shleifer, A., & Vishny, R. (1997). A survey of corporate governance. *Journal of Finance*, 52(2), 737–783.

Wahlen, J. (1994). The nature of information in commercial bank loan loss disclosures. *Accounting Review*, 69(3), 455–478.

Zang, A. Y. (2012). Evidence on the trade-off between real activities manipulation and accrual-based earnings management. *Accounting Review*, 87(2), 675–703.

Zinnes, C., Eilat, Y., & Sachs, J. (2001). The Gains from Privatization in Transition Economies: Is "Change of Ownership" Enough? IMF Staff Papers.

Tables and figures

Table 1.1 Number of observations by country and test

Country	Persis. SAMPLE I	Predict. SAMPLE II	Smooth. SAMPLE III	DLLP SAMPLE IV	Small Pos. SAMPLE V
ALBANIA	27	26	14	3	25
BOSNIA-HERZEGOVINA	15	15	10	4	25
BULGARIA	41	41	36	13	56
CROATIA	237	228	187	94	250
CZECH REPUBLIC	113	69	43	22	66
ESTONIA	37	31	27	13	29
HUNGARY	70	45	31	11	32
LATVIA	192	190	80	42	196
LITHUANIA	79	79	62	36	85
MACEDONIA (FYROM)	61	61	38	23	58
MONTENEGRO	0	0	4	0	16
POLAND	116	104	29	17	40
ROMANIA	107	106	59	41	112
SERBIA	36	34	25	15	47
SLOVAKIA	71	69	57	26	73
SLOVENIA	87	87	81	43	92
TOTAL	1,289	1,185	783	403	1,202

Table 1.2 Number of observations by year and test

Year	Persis.	Predict.	Smooth.	DLLP	Small Pos.
1997	75	72	34	25	66
1998	52	51	35	21	64
1999	67	65	38	23	75
2000	85	81	50	29	83
2001	96	91	52	25	90
2002	108	98	56	33	91
2003	124	110	69	33	96
2004	127	112	70	27	106
2005	137	123	83	34	120
2006	144	129	99	58	143
2007	163	146	112	54	162
2008	111	107	85	41	106
TOTAL	*1,289*	*1,185*	*783*	*403*	*1,202*

Table 2.1 Descriptive statistics (sample i: earnings persistence)

VARIABLE	Explanation	N	MEAN	MEDIAN	SD	MIN	MAX
Bank Reform	Banking Reform Index	1,289	3.406	3.330	0.458	2.330	4.000
Corp Reform	Corporate Reform Index	1,289	3.517	3.553	0.301	2.667	4.000
Creditor Rights	Creditor Rights	1,289	4.375	4.678	1.216	2.000	6.000
Corp Reform (r)	Corporate Reform Index (residual)	1,289	0.000	–0.002	0.207	–0.617	0.682
RISK	Reverse Z-Score	1,289	–3.239	–3.319	1.185	–5.462	0.991
VOLATILITY	σ(ROA)	1,289	0.008	0.004	0.012	0.000	0.070
EBT	Profit before Taxes / Total Assets	1,289	0.016	0.015	0.022	–0.068	0.083
SIZE	Ln_Assets	1,289	13.206	13.134	1.512	9.151	17.092
CAPITAL	Equity / Total Assets	1,289	0.125	0.099	0.087	0.027	0.611
DEPOSIT	Deposit / Total Assets	1,289	0.772	0.817	0.143	0.061	0.966
LOANS	Loan/ Total Assets	1,289	0.510	0.535	0.190	0.031	0.927
CORP	Corporate Loans (%)	1,289	0.861	1.000	0.328	0.006	1.000
SHORT	Short-term Loans (%)	1,289	0.623	0.500	0.293	0.181	1.500
PUBLIC	Exchange Listed	1,289	0.313	0.000	0.464	0.000	1.000
CRISIS	Bank Crisis (D)	1,289	0.085	0.000	0.278	0.000	1.000
INFLTN	Inflation	1,289	5.665	4.483	4.622	0.102	45.667
DI	Deposit Insurance (D)	1,289	0.967	1.000	0.178	0.000	1.000
GDP	GDP per Capital Growth (%)	1,289	5.191	5.200	2.864	–4.600	12.200

Table 2.2 Bank and macro characteristics by banking reform stage (sample i: earnings persistence)

VARIABLE (V)	STAGE 1	STAGE 2	STAGE 3	STAGE 4	STAGE 5	STAGE 6	ρ (V, Reform)	ρ (V, Risk)
Bank Reform	2.330	2.670	3.000	3.330	3.670	4.000	1.000	–0.174
Corp Reform	3.000	3.130	3.301	3.511	3.693	3.750	0.771	–0.095
Creditor Rights	4.724	4.477	4.690	3.913	4.689	4.151	0.083	0.229
Corp Reform (r)	0.100	0.035	0.017	0.038	0.025	–0.107	0.000	0.082
RISK	–2.792	–3.188	–2.704	–3.105	–3.369	–3.642	–0.174	1.000
VOLATILITY	0.005	0.014	0.016	0.007	0.005	0.004	–0.311	0.578
EBT	0.014	0.015	0.014	0.015	0.017	0.016	–0.011	–0.187
SIZE	12.633	12.195	12.665	13.489	13.498	13.694	0.366	–0.066
CAPITAL	0.078	0.188	0.137	0.109	0.101	0.117	–0.293	–0.152
DEPOSIT	0.907	0.722	0.767	0.778	0.798	0.771	0.151	0.131
LOANS	0.258	0.498	0.463	0.515	0.501	0.565	0.181	–0.202
CORP	1.000	0.960	0.930	0.888	0.828	0.752	–0.218	0.142
SHORT	0.500	0.678	0.692	0.622	0.565	0.610	–0.093	0.160
PUBLIC	0.000	0.452	0.289	0.276	0.269	0.324	–0.059	–0.170
CRISIS	0.000	0.101	0.162	0.095	0.030	0.076	–0.099	0.015
INFLTN	2.913	7.398	7.403	4.875	4.254	5.730	–0.290	0.075
DI	1.000	1.000	0.868	0.942	1.000	1.000	0.207	0.042
GDP (Growth)	4.767	4.529	5.013	4.689	6.681	4.507	0.114	0.040
Observations	6	199	197	275	334	278		
Raw PERSIS	0.139	0.485	0.493	0.616	0.709	0.758		

This table reports the mean values of bank characteristics and macroeconomic conditions by reform stage. Reform stages 1-6 are classified based on six *Banking reform* scores: 2.33, 2.67, 3, 3.33, 3.67, and 4; ρ (*V, Reform*) is the correlation between each variable and *Banking reform* index; ρ (*V, Risk*) is the correlation between each variable and our bank *Risk* variable;

Raw PERSIS is NOT from the multivariate model (3). Instead, we run a simple regression of EBT_{t+1} on EBT_t (with an intercept) within each stage. The coefficient on EBT_t is the *Raw PERSIS* reported.

Table 2.3 Multivariate analyses: H1 & H2 (earnings persistence)

$EBT_{t+1} = \alpha_0 + \alpha_t + \alpha_j + \beta_1 EBT_t + \beta_2 Reform_{j,t} + \beta_3 Risk_{i,t} + \boldsymbol{\beta_4} Reform_{j,t} \times EBT_{i,t} + \boldsymbol{\beta_5} Risk_{i,t} \times EBT_{i,t} + \sum\beta(Bank\ variables)_{i,t} + \sum\beta(Macro.\ variables)_{j,t} + \varepsilon_{i,t}$ (Baseline model)

Panel A		Benchmark	Baseline Model		Within-Country		Complete DID	
VARIABLES		(1)	(2)	(3)	(4)	(5)	(6)	(7)
*EBT * Bank Reform*	*β4* (*exp.* +)		0.261***	0.191***	0.474***	0.341***	0.420***	0.271***
			(3.599)	(2.765)	(4.948)	(3.558)	(3.122)	(2.813)
*EBT * Risk*	*β5* (*exp.* -)			–0.153***		–0.119***		–0.120***
				(–5.277)		(–3.753)		(–6.933)
EBT	β1	0.487***	–0.305	–0.446*	Absorbed	Absorbed	Absorbed	Absorbed
		(11.545)	(–1.242)	(–1.846)				
Bank Reform	β2		–0.006*	–0.005	–0.005***	–0.003**	–0.004**	–0.003**
			(–1.811)	(–1.479)	(–2.741)	(–2.122)	(–2.490)	(–2.109)
RISK	β3	–0.308**	–0.352***	–0.460***	–0.360***	–0.449***	–0.309***	–0.389***
		(–2.335)	(–2.694)	(–3.661)	(–2.933)	(–3.579)	(–2.659)	(–7.306)
VOLATILITY	β6	0.002**	0.002**	0.004***	0.002***	0.004***	0.002***	0.003***
		(2.338)	(2.452)	(4.570)	(3.118)	(4.449)	(2.764)	(5.838)
SIZE	β7	0.002***	0.002***	0.001***	0.001**	0.001	0.001**	0.001
		(4.719)	(4.008)	(3.068)	(2.134)	(1.334)	(2.502)	(1.602)
CAPITAL	β8	0.038***	0.036***	0.026**	0.029**	0.024**	0.029**	0.024***
		(3.197)	(3.051)	(2.311)	(2.425)	(2.043)	(2.388)	(2.980)
DEPOSIT	β9	–0.001	0.001	–0.001	–0.001	–0.002	0.001	–0.001
		(–0.122)	(0.265)	(–0.146)	(–0.205)	(–0.467)	(0.137)	(–0.140)
LOANS	β10	–0.000	–0.000	–0.002	–0.005*	–0.005*	–0.003	–0.003
		(–0.057)	(–0.117)	(–0.620)	(–1.923)	(–1.808)	(–1.318)	(–1.207)
CORP	β11	–0.001	–0.002	–0.002*	–0.001	–0.001	–0.001	–0.002
		(–1.120)	(–1.566)	(–1.824)	(–0.846)	(–1.170)	(–1.133)	(–1.249)
SHORT	β12	–0.001	0.000	–0.000	0.001	0.001	0.001	0.001
		(–0.323)	(0.014)	(–0.071)	(0.437)	(0.270)	(0.636)	(0.557)
PUBLIC	β13	–0.001	–0.000	–0.001	0.001	0.000	0.000	0.000
		(–0.713)	(–0.430)	(–0.735)	(0.521)	(0.453)	(0.430)	(0.270)
CRISIS	β14	0.004	0.003	0.003	0.003	0.002	0.004**	0.004*
		(1.487)	(1.063)	(1.256)	(1.524)	(1.173)	(2.089)	(1.813)
INFLTN	β15	0.000	0.000	0.000	–0.000	–0.000	–0.000	–0.000
		(0.682)	(0.636)	(0.438)	(–0.171)	(–0.337)	(–0.210)	(–0.500)
DI	β16	–0.009***	–0.009***	–0.009**	–0.013***	–0.012***	–0.011***	–0.010***
		(–2.641)	(–2.674)	(–2.531)	(–3.682)	(–3.497)	(–3.212)	(–3.375)
GDP	β17	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***
		(3.954)	(3.947)	(3.978)	(5.918)	(5.717)	(4.571)	(4.853)
Country-level Persistence		No	No		∑ Country Dummy * EBT		∑ Country Dummy * EBT	
Year-level Persistence		No	No		No		∑ Year Dummy * EBT	
Observations		1,289	1,289	1,289	1,289	1,289	1,289	1,289
Adj. R2		0.427	0.440	0.480	0.454	0.473	0.484	0.502

* Significance level at 10% level. ** Significance level at 5% level. *** Significance level at 1% level, robust standard errors.

Table 2.3 (Continued)

Panel B		Corporate Reform					
		Baseline Model		Within-Country		Complete DID	
		(1)	(2)	(3)	(4)	(5)	(6)
EBT * Other Reform	*β4*	0.223**	0.211**	0.969***	0.726***	1.106***	0.899**
		(2.106)	(2.045)	(4.673)	(3.451)	(3.068)	(2.545)
EBT * Risk	*β5* (*exp.* -)		–0.162***		–0.125***		–0.126***
			(–5.563)		(–3.966)		(–4.386)
Observations		1,289	1,289	1,289	1,289	1,289	1,289
Adj. R2		0.432	0.478	0.452	0.473	0.483	0.504

Panel C		Corporate Reform (residual)					
		(1)	(2)	(3)	(4)	(5)	(6)
EBT * Other Reform	*β4*	–0.101	0.101	–0.342	–0.104	–0.185	0.014
		(–0.486)	(0.481)	(–1.266)	(–0.404)	(–0.694)	(0.055)
EBT * Risk	*β5* (*exp.* -)		–0.165***		–0.145***		–0.132***
			(–5.444)		(–4.630)		(–4.683)
Observations		1,289	1,289	1,289	1,289	1,289	1,289
Adj. R2		0.427	0.474	0.432	0.462	0.476	0.499

Panel D		Creditor Rights					
		(1)	(2)	(3)	(4)	(5)	(6)
EBT * Other Reform	*β4*	–0.087**	–0.053	–0.016	–0.001	–0.127**	–0.087
		(–2.323)	(–1.480)	(–0.287)	(–0.009)	(–2.064)	(–1.439)
EBT * Risk	*β5* (*exp.* -)		–0.151***		–0.145***		–0.126***
			(–5.143)		(–4.652)		(–4.483)
Observations		1,289	1,289	1,289	1,289	1,289	1,289
Adj. R2		0.441	0.479	0.432	0.463	0.481	0.502

* Significance level at 10% level. ** Significance level at 5% level. *** Significance level at 1% level, robust standard errors.

Table 2.4 Multivariate analyses: H3 & H4 (earnings persistence)

Panel A	(1)	(2)	(3)	(4)	(5)	(6)
	High Risk	Low Risk	High Risk	Low Risk	High Risk	Low Risk
	Risk>–3.319	Risk≤–3.319	Risk>–3.319	Risk≤–3.319	Risk>–3.319	Risk≤–3.319
Expected:	*β1_high<β1_low* (*H2*)		*β4_high>β4_low* (*H3*a)		*β4_high>β4_low* (*H3*a)	
EBT * Bank Reform (*β4*)			0.291***	0.064	0.565***	0.022
			(3.117)	(0.864)	(4.698)	(0.190)
EBT (*β1*)	0.412***	0.819***	–0.467	0.621***	Absorbed	Absorbed
	(8.071)	(22.603)	(–1.505)	(2.732)		
Country-level Persistence	NO	NO	NO	NO	YES	YES
Other Controls	YES	YES	YES	YES	YES	YES
Observations	644	645	644	645	644	645
Adj. R2 (*Expected: high's<low's*)	0.335	0.756	0.349	0.756	0.392	0.758

Panel B	(1)	(2)	(3)	(4)	(5)	(6)
	Low Reform	High Reform	Low Reform	High Reform	Low Reform	High Reform
	Reform≤3.33	Reform>3.33	Reform≤3.33	Reform>3.33	Reform≤3.33	Reform>3.33
Expected:	*β1_low<β1_high* (*H1*)		*β5_low<β5_high* (*H4*a)		*β5_low<β5_high* (*H4*a)	
EBT * Risk (*β5*)			–0.174***	–0.068*	–0.135***	–0.070*
			(–4.880)	(–1.828)	(–3.500)	(–1.960)
EBT (*β1*)	0.413***	0.710***	0.035	0.527***	Absorbed	Absorbed
	(7.830)	(15.144)	(0.344)	(4.589)		
Country-level Persistence	NO	NO	NO	NO	YES	YES
Other Controls	YES	YES	YES	YES	YES	YES
Observations	677	612	677	612	677	612
Adj. R2 (*Expected: low<high*)	0.382	0.625	0.437	0.631	0.447	0.643

* Significance level at 10% level. ** Significance level at 5% level. *** Significance level at 1% level, robust standard errors.

Table 3.1 Multivariate analyses: H1 & H2 (predictability of cash flows)

$EBTLLP_{t+1} = \alpha_0 + \alpha_t + \alpha_j + \beta_1 EBT_t + \beta_2 Reform_{j,t} + \beta_3 Risk_{i,t} + \boldsymbol{\beta_4} Reform_{j,t} \times EBT_{i,t} + \boldsymbol{\beta_5} Risk_{i,t} \times EBT_{i,t} + \sum\beta(Bank\ variables)_{i,t} + \sum\beta(Macro.\ variables)_{j,t} + \varepsilon_{i,t}$ (Baseline model)

Panel A		Benchmark	Baseline Model		Within-Country		Complete DID	
VARIABLES		(1)	(2)	(3)	(4)	(5)	(6)	(7)
*EBT * Bank Reform*	*β4* (*exp. +*)		0.358***	0.313***	0.513***	0.389***	0.718***	0.579***
			(4.019)	(3.693)	(4.157)	(3.340)	(3.639)	(4.627)
*EBT * Risk*	*β5* (*exp. -*)			–0.125***		–0.117***		–0.120***
				(–3.869)		(–3.127)		(–5.463)
EBT	β1	0.434***	–0.644**	–0.792***	Absorbed	Absorbed	Absorbed	Absorbed
		(8.395)	(–2.202)	(–2.772)				
Bank Reform	β2		–0.006	–0.005	–0.015***	–0.014***	–0.015***	–0.014***
			(–1.332)	(–1.169)	(–6.730)	(–6.568)	(–6.721)	(–7.466)
RISK	β3	–0.054	–0.105	–0.193	–0.078	–0.164	–0.047	–0.125*
		(–0.425)	(–0.846)	(–1.578)	(–0.654)	(–1.348)	(–0.410)	(–1.865)
VOLATILITY	β6	0.001	0.001	0.003***	0.001	0.003***	0.001	0.002***
		(1.346)	(1.593)	(3.210)	(1.536)	(2.974)	(1.103)	(3.303)
SIZE	β7	0.002***	0.002***	0.001**	0.001	0.000	0.001	0.000
		(3.697)	(2.889)	(2.190)	(1.273)	(0.620)	(1.622)	(0.909)
CAPITAL	β8	0.041**	0.036**	0.024	0.040**	0.033*	0.037*	0.030***
		(2.324)	(2.090)	(1.416)	(2.053)	(1.735)	(1.922)	(2.709)
DEPOSIT	β9	–0.005	–0.003	–0.006	–0.010	–0.011	–0.008	–0.010*
		(–0.677)	(–0.472)	(–0.791)	(–1.244)	(–1.482)	(–1.185)	(–1.784)
LOANS	β10	0.020***	0.019***	0.018***	0.014***	0.015***	0.017***	0.018***
		(4.403)	(4.446)	(4.201)	(3.856)	(4.028)	(4.608)	(5.234)
CORP	β11	0.001	0.001	0.000	0.001	0.001	0.001	0.000
		(0.778)	(0.385)	(0.100)	(0.795)	(0.493)	(0.544)	(0.162)
SHORT	β12	–0.002	–0.001	–0.001	–0.002	–0.003	–0.002	–0.003
		(–0.889)	(–0.347)	(–0.371)	(–0.850)	(–1.030)	(–0.862)	(–1.093)
PUBLIC	β13	–0.003**	–0.003**	–0.003**	0.001	0.001	0.001	0.000
		(–2.340)	(–2.126)	(–2.300)	(0.589)	(0.545)	(0.450)	(0.325)
CRISIS	β14	0.006*	0.005	0.005	0.004	0.003	0.006**	0.005**
		(1.783)	(1.504)	(1.614)	(1.355)	(1.066)	(2.102)	(2.031)
INFLTN	β15	–0.000	–0.000	–0.000	–0.000	–0.000	–0.000	–0.000*
		(–0.696)	(–0.868)	(–1.007)	(–1.133)	(–1.246)	(–1.419)	(–1.856)
DI	β16	–0.006	–0.006	–0.006	–0.016***	–0.015***	–0.012***	–0.012***
		(–1.504)	(–1.418)	(–1.337)	(–4.345)	(–4.201)	(–3.236)	(–3.082)
GDP	β17	0.000	0.000	0.000	0.001**	0.001**	0.001**	0.001**
		(1.240)	(1.195)	(1.077)	(2.345)	(2.027)	(2.105)	(2.032)
Country-level Predictability		No	No	No	∑ Country Dummy * EBT		∑ Country Dummy * EBT	
Year-level Predictability		No	No	No	No	No	∑ Year Dummy * EBT	
Observations		1,185	1,185	1,185	1,185	1,185	1,185	1,185
Adj. R2		0.386	0.404	0.425	0.381	0.395	0.402	0.416

* Significance level at 10% level. ** Significance level at 5% level. *** Significance level at 1% level, robust standard errors.

Table 3.1 (Continued)

Panel B		Corporate Reform					
		Baseline Model		Within-Country		Complete DID	
		(1)	(2)	(3)	(4)	(3)	(4)
EBT * Other Reform	*β4*	0.348***	0.359***	0.630***	0.380*	1.468***	1.199***
		(2.708)	(2.939)	(2.931)	(1.648)	(3.492)	(2.728)
EBT * Risk	*β5* (*exp.* -)		–0.138***		–0.136***		–0.137***
			(–4.174)		(–3.358)		(–3.599)
Observations		1,185	1,185	1,185	1,185	1,185	1,185
Adj. R2		0.397	0.423	0.372	0.392	0.396	0.415

Panel C		Corporate Reform (residual)					
		(1)	(2)	(3)	(4)	(5)	(6)
EBT * Other Reform	*β4*	0.020	0.208	–0.180	0.028	–0.020	0.180
		(0.071)	(0.791)	(–0.492)	(0.084)	(–0.053)	(0.511)
EBT * Risk	*β5* (*exp.* -)		–0.142***		–0.138***		–0.145***
			(–4.290)		(–3.634)		(–3.891)
Observations		1,185	1,185	1,185	1,185	1,185	1,185
Adj. R2		0.386	0.413	0.347	0.368	0.367	0.389

Panel D		Creditor Rights					
		(1)	(2)	(3)	(4)	(5)	(6)
EBT * Other Reform	*β4*	–0.064	–0.035	0.023	0.040	0.018	0.065
		(–1.506)	(–0.829)	(0.391)	(0.662)	(0.247)	(0.894)
EBT * Risk	*β5* (*exp.* -)		–0.124***		–0.137***		–0.144***
			(–3.515)		(–3.453)		(–3.906)
Observations		1,185	1,185	1,185	1,185	1,185	1,185
Adj. R2		0.404	0.424	0.348	0.370	0.367	0.389

* Significance level at 10% level. ** Significance level at 5% level. *** Significance level at 1% level, robust standard errors.

Table 3.2 Multivariate analyses: H3 & H4 (predictability of cash flows)

Panel A	(1)	(2)	(3)	(4)	(5)	(6)
	High Risk	Low Risk	High Risk	Low Risk	High Risk	Low Risk
	Risk>3.317	Risk≤3.317	Risk>3.317	Risk≤3.317	Risk>3.317	Risk≤3.317
Expected:	*β1_high<β1_low* (*H2*)		*β4_high>β4_low* (*H3*a)		*β4_high>β4_low* (*H3*a)	
EBT * Bank Reform (β4)			0.412***	0.023	0.693***	0.169
			(3.679)	(0.202)	(4.560)	(1.021)
EBT (β1)	0.369***	0.746***	–0.865**	0.670*	Absorbed	Absorbed
	(5.805)	(13.239)	(–2.396)	(1.787)		
Country-level Persistence	No	No	No	No	Yes	Yes
Other Controls	YES	YES	YES	YES	YES	YES
Observations	592	593	592	593	592	593
Adj. R2 (*Expected: high's<low's*)	0.296	0.618	0.319	0.621	0.333	0.610

Panel B	(1)	(2)	(3)	(4)	(5)	(6)
	Low Reform	High Reform	Low Reform	High Reform	Low Reform	High Reform
	Reform≤3.33	Reform>3.33	Reform≤3.33	Reform>3.33	Reform≤3.33	Reform>3.33
Expected:	*β1_low<β1_high* (*H1*)		*β5_low<β5_high* (*H4*a)		*β5_low<β5_high* (*H4*a)	
EBT * Risk (β5)			–0.143***	–0.082	–0.130***	–0.052
			(–3.728)	(–1.613)	(–2.780)	(–1.269)
EBT (β1)	0.371***	0.738***	0.060	0.528***	Absorbed	Absorbed
	(6.353)	(9.947)	(0.547)	(3.301)		
Country-level Persistence	No	No	No	No	Yes	Yes
Other Controls	YES	YES	YES	YES	YES	YES
Observations	660	525	660	525	660	525
Adj. R2 (*Expected: low<high*)	0.378	0.529	0.408	0.535	0.360	0.604

* Significance level at 10% level. ** Significance level at 5% level. *** Significance level at 1% level, robust standard errors.

Table 4.1 Multivariate analyses: H1 & H2 (LLP-based earnings smoothing)

$LLP_t = +\alpha_t + \alpha_j + \beta_1 EBTLLP_t + \beta_2 Reform_{j,t} + \beta_3 Risk_{i,t} + \boldsymbol{\beta_4} Reform_{j,t} \times EBTLLP_{i,t} + \boldsymbol{\beta_5} Risk_{i,t} \times EBTLLP_{i,t} + \sum\beta(Bank\ variables)_{i,t} + \sum\beta(Macro.\ variables)_{j,t} + \varepsilon_{i,t}$ (Baseline model)

Panel A		Benchmark		Baseline Model		Within-Country		Complete DID	
VARIABLES		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		EBTLLP>0	*EBTLLP<0*						
*EBTLLP * Bank Reform*	*β4* (*exp.* -)			–0.366***	–0.322***	–0.383***	–0.312***	–0.236***	–0.152*
				(–5.492)	(–4.891)	(–4.766)	(–4.062)	(–2.723)	(–1.685)
*EBTLLP * Risk*	*β5* (*exp.* +)				0.069***		0.072***		0.072***
					(2.735)		(2.652)		(2.712)
EBTLLP	β1	0.261***	–0.030	1.384***	1.459***	Absorbed	Absorbed	Absorbed	Absorbed
		(6.044)	(–0.088)	(5.929)	(6.632)				
Bank Reform	β2			0.005**	0.004*	0.004*	0.002	0.003*	0.002
				(1.991)	(1.819)	(1.934)	(1.241)	(1.807)	(1.068)
RISK	β3	0.001	–0.001	0.000	–0.001*	0.001	–0.001*	0.000	–0.001*
		(1.526)	(–0.373)	(1.198)	(–1.876)	(1.406)	(–1.684)	(1.089)	(–1.907)
VOLATILITY	β6	0.149	0.595*	0.099	0.033	0.093	0.039	0.111	0.056
		(1.338)	(2.018)	(0.960)	(0.338)	(0.909)	(0.388)	(1.120)	(0.581)
BEGLLA	β7	–0.000	–0.002	–0.000	–0.000	–0.000	–0.000	–0.000	–0.000
		(–1.046)	(–1.597)	(–1.369)	(–1.475)	(–1.244)	(–1.372)	(–1.293)	(–1.445)
CHLOANS	β8	–0.004	0.077*	–0.005	–0.004	–0.006	–0.005	–0.004	–0.003
		(–0.681)	(1.766)	(–0.769)	(–0.668)	(–0.883)	(–0.779)	(–0.646)	(–0.500)
LOANS	β9	0.001	–0.063*	–0.000	–0.000	–0.000	–0.000	0.000	0.000
		(0.277)	(–1.806)	(–0.161)	(–0.164)	(–0.020)	(–0.130)	(0.180)	(0.144)
NPL	β10	0.155***	0.713*	0.167***	0.182***	0.152***	0.167***	0.149***	0.163***
		(3.092)	(1.817)	(3.970)	(4.304)	(3.390)	(3.662)	(3.553)	(3.770)
CHNPL	β11	0.055	–0.197	0.071	0.070	0.101**	0.100**	0.098**	0.097**
		(1.098)	(–0.575)	(1.489)	(1.491)	(2.111)	(2.097)	(2.113)	(2.100)
CORP	β12	0.001	–0.016	0.001	0.001*	0.001	0.001	0.001	0.001*
		(0.911)	(–1.489)	(1.360)	(1.776)	(0.952)	(1.537)	(1.184)	(1.766)
SHORT	β13	–0.002	–0.006	–0.002*	–0.002*	–0.001	–0.001	–0.001	–0.001
		(–1.567)	(–0.627)	(–1.844)	(–1.857)	(–0.903)	(–0.687)	(–1.231)	(–1.132)
GDP	β14	–0.000***	0.001	–0.000**	–0.000**	–0.000***	–0.000***	–0.000***	–0.000***
		(–3.192)	(0.778)	(–2.514)	(–2.554)	(–3.488)	(–3.400)	(–2.844)	(–2.777)
Country-level Persistence		No	No	No	No	∑ Country Dummy * EBTLLP		∑ Country Dummy * EBTLLP	
Year-level Persistence		No	No	No	No	No	No	∑ Year Dummy * EBTLLP	
Observations		783	47	783	783	783	783	783	783
Adj. R2		0.494	0.392	0.549	0.564	0.547	0.561	0.562	0.576

* Significance level at 10% level. ** Significance level at 5% level. *** Significance level at 1% level, robust standard errors.

Table 4.1 (Continued)

Panel B		Corporate Reform					
		Baseline Model		Within-Country		Complete DID	
		(1)	(2)	(3)	(4)	(3)	(4)
EBTLLP * Other Reform	*β4*	–0.492***	–0.456***	–0.579***	–0.534***	0.200	0.218
		(–4.270)	(–4.320)	(–3.282)	(–3.018)	(0.993)	(1.068)
EBTLLP * Risk	*β5* (*exp.* +)		0.087***		0.094***		0.079***
			(3.215)		(3.405)		(3.267)
Observations		783	783	783	783	783	783
Adj. R2		0.532	0.557	0.516	0.542	0.560	0.577

Panel C		Corporate Reform (residual)					
		Baseline Model		Within-Country		Complete DID	
		(1)	(2)	(3)	(4)	(5)	(6)
EBTLLP * Other Reform	*β4*	–0.010	–0.008	–0.021	–0.012	0.004	0.009
		(–0.364)	(–0.342)	(–0.420)	(–0.238)	(0.081)	(0.167)
EBTLLP * Risk	*β5* (*exp.* +)		0.095***		0.099***		0.081***
			(3.454)		(3.671)		(3.318)
Observations		783	783	783	783	783	783
Adj. R2		0.492	0.523	0.507	0.536	0.556	0.575

Panel D		Creditor Rights					
		Baseline Model		Within-Country		Complete DID	
		(1)	(2)	(3)	(4)	(5)	(6)
EBTLLP * Other Reform	*β4*	0.027	–0.077	0.464**	0.297*	0.284*	0.132
		(0.129)	(–0.471)	(2.553)	(1.894)	(1.739)	(0.814)
EBTLLP * Risk	*β5* (*exp.* +)		0.094***		0.083***		0.077***
			(3.302)		(3.073)		(2.980)
Observations		783	783	783	783	783	783
Adj. R2		0.500	0.528	0.531	0.550	0.561	0.577

* Significance level at 10% level. ** Significance level at 5% level. *** Significance level at 1% level, robust standard errors.

Table 4.2 Multivariate analyses: H3 & H4 (LLP-based earnings smoothing)

Panel A	(1)	(2)	(3)	(4)	(5)	(6)
	High Risk	Low Risk	High Risk	Low Risk	High Risk	Low Risk
	Risk≥-3.602	Risk<-3.602	Risk≥-3.602	Risk<-3.602	Risk≥-3.602	Risk<-3.602
Expected:	*β1_high>β1_low*(*H2*)		*β4_high<β4_low*(*H3*a)		*β4_high<β4_low*(*H3*a)	
EBT * Bank Reform (β4)			–0.369***	–0.311***	–0.392***	–0.205*
			(–4.699)	(–3.576)	(–2.917)	(–1.793)
EBT (β1)	0.300***	0.211***	1.419***	1.189***	Absorbed	Absorbed
	(5.964)	(4.298)	(5.234)	(4.062)		
Country-level Smoothing	No	No	No	No	Yes	Yes
Other Controls	YES	YES	YES	YES	YES	YES
Observations	392	391	392	391	391	392
Adj. R2	0.546	0.522	0.598	0.560	0.600	0.569

Panel B	(1)	(2)	(3)	(4)	(5)	(6)
	Low Reform	High Reform	Low Reform	High Reform	Low Reform	High Reform
	Reform≤3.33	Reform>3.33	Reform≤3.33	Reform>3.33	Reform≤3.33	Reform>3.33
Expected:	*β1_low>β1_high* (*H1*)		*β5_low>β5_high* (*H4*a)		*β5_low>β5_high* (*H4*a)	
EBT * Risk (β5)			0.094***	–0.017	0.124***	0.003
			(3.252)	(–0.728)	(4.287)	(0.132)
EBT (β1)	0.305***	0.040	0.580***	–0.019	Absorbed	Absorbed
	(5.830)	(1.336)	(6.198)	(–0.230)		
Country-level Smoothing	No	No	No	No	Yes	Yes
Other Controls	YES	YES	YES	YES	YES	YES
Observations	392	391	392	391	392	391
Adj. R2	0.474	0.393	0.504	0.392	0.539	0.401

* Significance level at 10% level. ** Significance level at 5% level. *** Significance level at 1% level, robust standard errors.

Table 5.1 Multivariate analyses: H1 & H2 (earnings-inflating discretionary LLP)

$|\text{DLLP}|_{i,t} = \alpha_0 + \boldsymbol{\beta_1} Reform_{j,t} + \boldsymbol{\beta_2} Risk_{i,t} + \sum\beta(Bank\ variables)_{i,t} + \beta GDP + \varepsilon_{i,t}$ (Baseline Model)

Panel A		Baseline Model		Within-Country		Complete DID	
VARIABLES		(1)	(2)	(3)	(4)	(5)	(6)
Bank Reform	*β1* (*exp. <0*)	*–0.0034***	*–0.0031***	*–0.0024***	*–0.0020***	*–0.0013*	*–0.0012*
		(–6.541)	*(–5.873)*	*(–3.164)*	*(–2.595)*	*(–1.090)*	*(–0.977)*
RISK	*β2* (*exp. >0*)		*0.0007***		*0.0008***		*0.0007***
			(3.226)		*(3.724)*		*(3.191)*
SIZE	β3	–0.0006***	–0.0006***	–0.0005**	–0.0004**	–0.0004**	–0.0004*
		(–3.395)	(–3.381)	(–2.199)	(–2.013)	(–1.989)	(–1.847)
GROWTH	β4	0.0406**	0.0297	0.0377**	0.0270	0.0375**	0.0274
		(2.103)	(1.543)	(2.269)	(1.624)	(2.221)	(1.616)
L.LLP_ta	β5	0.0020***	0.0019***	0.0021***	0.0021***	0.0020***	0.0019***
		(2.847)	(2.684)	(3.079)	(3.110)	(2.813)	(2.825)
EBTLLP	β6	–0.0441***	–0.0322**	–0.0599***	–0.0491***	–0.0634***	–0.0529***
		(–3.143)	(–2.238)	(–4.815)	(–3.909)	(–4.910)	(–4.019)
DEPOSIT	β7	–0.0087***	–0.0091***	–0.0060***	–0.0065***	–0.0064***	–0.0066***
		(–4.215)	(–4.426)	(–2.848)	(–3.136)	(–2.962)	(–3.097)
PUBLIC	β8	0.0006	0.0009**	0.0003	0.0006	0.0001	0.0005
		(1.399)	(2.111)	(0.476)	(1.070)	(0.178)	(0.795)
GDP	β9	–0.0000	–0.0000	–0.0000	–0.0000	–0.0000	–0.0000
		(–0.187)	(–0.069)	(–0.133)	(–0.087)	(–0.187)	(–0.205)
Creditor Rights	β10	*0.0000*	*–0.0001*	*–0.0009*	*–0.0010*	*–0.0004*	*–0.0005*
		(0.235)	*(–0.267)*	*(–1.400)*	*(–1.498)*	*(–0.625)*	*(–0.716)*
Fixed Effects		None	None	Ctry	Ctry	Ctry& Yr	Ctry& Yr
Observations		403	403	403	403	403	403
Adj. R2		0.276	0.297	0.312	0.334	0.309	0.325

* Significance level at 10% level. ** Significance level at 5% level. *** Significance level at 1% level, robust standard errors.

Table 5.1 (Continued)

Panel B		Corporate Reform					
		Baseline Model		Within-Country		Complete DID	
		(1)	(2)	(3)	(4)	(5)	(6)
Other Reform	*β1*	–0.0049***	–0.0046***	–0.0068***	–0.0050**	–0.0020	–0.0013
		(–6.055)	(–5.643)	(–2.890)	(–2.104)	(–0.510)	(–0.353)
Risk	*β2* (*exp. >0*)		0.0009***		0.0008***		0.0008***
			(4.099)		(3.498)		(3.259)
Observations		404	404	404	404	404	404
Adj. R2		0.251	0.284	0.309	0.331	0.304	0.323

Panel C		Corporate Reform (residual)					
		(1)	(2)	(3)	(4)	(5)	(6)
Other Reform	*β1*	0.0006	0.0001	0.0027	0.0026	0.0013	0.0013
		(0.559)	(0.129)	(1.484)	(1.465)	(0.614)	(0.636)
Risk	*β2* (*exp. >0*)		0.0010***		0.0009***		0.0008***
			(4.346)		(4.017)		(3.282)
Observations		404	404	404	404	404	404
Adj. R2		0.185	0.225	0.296	0.326	0.304	0.324

* Significance level at 10% level. ** Significance level at 5% level. *** Significance level at 1% level, robust standard errors.

Table 5.2 Multivariate analyses: H3 & H4 (earnings-inflating discretionary LLP)

Panel A	Baseline Model		Within-Country		Complete DID	
	High Risk	Low Risk	High Risk	Low Risk	High Risk	Low Risk
	Risk≥–3.427	Risk<–3.427	Risk≥–3.427	Risk<–3.427	Risk≥–3.427	Risk<–3.427
Expected:	*β1_high<β1_low* (*H3*a)		*β1_high<β1_low* (*H3*a)		*β1_high<β1_low* (*H3*a)	
Bank Reform (β1)	–0.0063***	–0.0051***	–0.0054***	–0.0031***	–0.0057	0.0016
	(–6.424)	(–4.900)	(–2.792)	(–2.781)	(–1.575)	(0.408)
Fixed Effects	No	No	Ctry	Ctry	Ctry& Yr	Ctry& Yr
Observations	202	201	202	201	202	201
Adj. R2	0.196	0.153	0.270	0.290	0.344	0.348

Panel B	Baseline		Within-Country		Complete DID	
	Low Reform	High Reform	High Risk	Low Risk	High Risk	Low Risk
	Reform≤3.33	Reform>3.33	Reform≤3.33	Reform>3.33	Reform≤3.33	Reform>3.33
Expected:	*β2_low>β1_high* (*H4*a)		*β2_low>β1_high* (*H4*a)		*β2_low>β1_high* (*H4*a)	
Risk (β2)	0.0013***	0.0009**	0.0014***	0.0007*	0.0015***	0.0007*
	(2.785)	(2.228)	(3.003)	(1.740)	(2.836)	(1.661)
Fixed Effects	None	None	Ctry	Ctry	Ctry& Yr	Ctry& Yr
Observations	229	174	229	174	229	174
Adj. R2	0.293	0.180	0.292	0.187	0.345	0.164

* Significance level at 10% level. ** Significance level at 5% level. *** Significance level at 1% level, robust standard errors.

Table 6.1 *H1* (small positive earnings) multinomial logistic regression

$\ln(P_{i,t,m}/P_{i,t,0}) = \alpha_m + \beta_{1,m} Reform_{j,t} + \varepsilon_{i,t}$, (Baseline model for the general sample)

where *m* stands for *outcome 1* and *outcome 2*. We are interested in the impact of *Banking reform* on the likelihood that ROA falls into the suspect interval (*outcome 1*) as opposed to the nearby reference interval(s) (outcome 0). For brevity, the results for the likelihood that ROA falls into a non-suspect interval (outcome 2) as opposed to the reference intervals are not presented. As a result, the second sub-script in the coefficients is omitted from the tables below (e.g. β_1 represents $\beta_{1,1}$)

.

Panel A: General Sample		Baseline Model		Within-Country		Complete DID	
		(1)	(2)	(3)	(4)	(5)	(6)
		Benchmark 1	Benchmark 2	Benchmark 1	Benchmark 2	Benchmark 1	Benchmark 2
Bank Reform	*β1* (*exp. <0*)	–0.4021***	–0.6193***	–0.8253***	–1.1515***	–1.0018**	–0.8850**
		(–2.829)	(–4.118)	(–3.983)	(–5.152)	(–2.443)	(–2.003)
Fixed Effects		None	None	Ctry	Ctry	Ctry& Yr	Ctry& Yr
Other Controls		None	None	None	None	None	None
Observations		2,515	2,515	2,515	2,515	2,515	2,515
Pseudo R2		0.0249	0.0115	0.0571	0.0450	0.0737	0.0554

$\ln(P_{i,t,m}/P_{i,t,0}) = \alpha_m + \boldsymbol{\beta_{1,m}} Reform_{j,t} + \boldsymbol{\beta_{2,m}} Risk_{i,t} + \sum \beta_{n,m} (Bank\ variables)_{i,t} + \beta_{9,m} G + \varepsilon_{i,t}$

(Baseline Model for the final sample)

Panel B: Final Sample (***Benchmark I***)		Baseline Model		Within-Country		Complete DID	
		(1)	(2)	(3)	(4)	(5)	(6)
Bank Reform	*β1* (*exp. <0*)	*–0.1990*	*–0.0437*	*–0.2446*	*0.1687*	*–0.9035*	*–0.5301*
		(–0.702)	*(–0.146)*	*(–0.648)*	*(0.409)*	*(–1.117)*	*(–0.652)*
Risk	*β2* (*exp. >0*)		*0.5628****		*0.5855****		*0.6002****
			(4.013)		*(4.098)*		*(4.117)*
SIZE	β3	*–0.1746***	*–0.2085****	*–0.2561****	*–0.2963****	*–0.2986****	*–0.3391****
		(–2.453)	*(–2.703)*	*(–3.257)*	*(–3.511)*	*(–3.667)*	*(–3.952)*
GROWTH	β4	0.2513	0.1496	0.4243	0.3513	0.6388	0.6019
		(0.651)	(0.397)	(1.095)	(0.925)	(1.628)	(1.589)
LOANS	β5	–0.4297	0.1932	–0.5484	–0.0556	–1.0636	–0.6945
		(–0.675)	(0.264)	(–0.699)	(–0.061)	(–1.307)	(–0.759)
CHCFE	β6	–3.5170	–5.7308	–4.3351	–7.3692	–3.9140	–6.8597
		(–0.517)	(–0.943)	(–0.565)	(–1.060)	(–0.511)	(–0.959)
BEGLLA	β7	0.0421**	0.0269	0.0534**	0.0377*	0.0721***	0.0599***
		(2.221)	(1.543)	(2.459)	(1.919)	(3.015)	(2.760)
PUBLIC	β8	–0.9740***	–0.8102***	–0.6801**	–0.5968*	–0.6513**	–0.5574*
		(–3.401)	(–2.767)	(–2.105)	(–1.916)	(–2.007)	(–1.735)
GDP	β9	–0.1295***	–0.1287***	–0.1547***	–0.1588***	–0.0804	–0.0853
		(–3.323)	(–3.347)	(–3.356)	(–3.366)	(–1.284)	(–1.341)
Creditor Rights	β10	–0.1168	–0.2305**	0.6379	0.4969	0.4282	0.2830
		(–1.160)	(–2.249)	(1.622)	(1.221)	(1.014)	(0.658)
Observations		1,202	1,202	1,202	1,202	1,202	1,202
Pseudo R2		0.132	0.221	0.194	0.277	0.232	0.318

Panel C: Final Sample (Benchmark II)		Baseline Model		Within-Country		Complete DID	
		(1)	(2)	(3)	(4)	(5)	(6)
Banking Reform	*β1* (*exp. <0*)	*–0.2593*	*–0.1284*	*–0.5888*	*–0.2996*	*–0.4998*	*–0.2077*
		(–0.866)	*(–0.400)*	*(–1.425)*	*(–0.672)*	*(–0.580)*	*(–0.237)*
RISK	*β2* (*exp. >0*)		*0.2984***		*0.3569****		*0.3605***
			(2.332)		*(2.627)*		*(2.571)*
Other Controls		Yes	Yes	Yes	Yes	Yes	Yes
Fixed Effects		None	None	Ctry	Ctry	Ctry& Yr	Ctry& Yr
Observations		1,202	1,202	1,202	1,202	1,202	1,202
Pseudo R2		0.0353	0.0393	0.0821	0.0868	0.0960	0.100

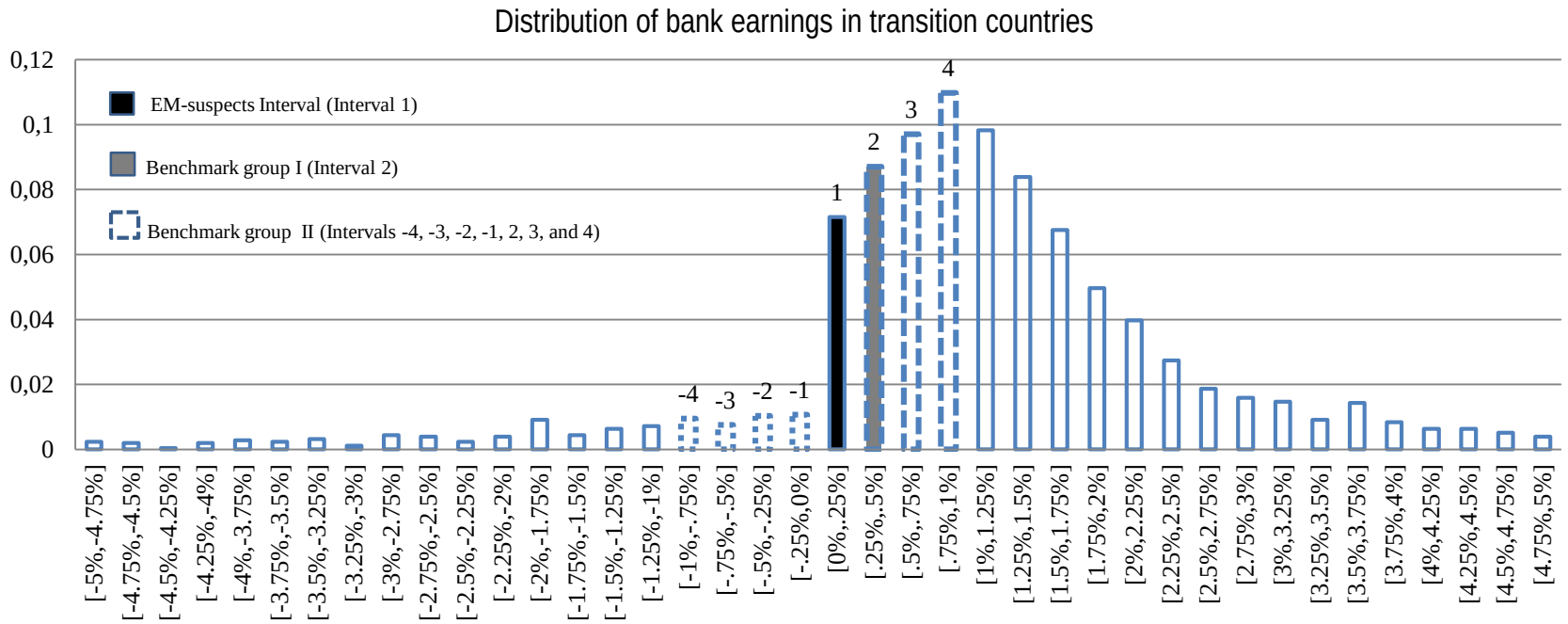
** Significance level at 5% level. *** Significance level at 1% level, robust standard errors.

Table 6.2 Multivariate analyses: *h3* & *h4* (small positive earnings)

Panel A	Benchmark I		Benchmark II	
	High Risk	Low Risk	High Risk	Low Risk
	Risk>-3.431	Risk<–3.431	Risk>–3.431	Risk<–3.431
Expected:	*β1_high<β1_low* (*H3*a)		*β1_high<β1_low* (*H3*a)	
Bank Reform (β1)	–0.2448	0.0082	–0.3137	–0.0814
	(–0.497)	(0.023)	(–0.614)	(–0.209)
Fixed Effects	NO	NO	NO	NO
Other Controls	YES	YES	YES	YES
Observations	601	601	601	601
Pseudo R2	0.133	0.137	0.0546	0.0477

Panel B	Benchmark I		Benchmark II	
	Low Reform	High Reform	Low Reform	High Reform
	Reform≤3.33	Reform>3.33	Reform≤3.33	Reform>3.33
Expected:	*β2_low>β2_high* (*H4*a)		*β2_low>β2_high* (*H4*a)	
Risk (β2)	0.966***	0.464***	0.667***	0.264*
	(3.440)	(2.739)	(2.717)	(1.693)
Other Controls	YES	YES	YES	YES
Fixed Effects	NO	NO	NO	NO
Observations	678	524	678	524
Pseudo R2	0.259	0.185	0.0973	0.0363

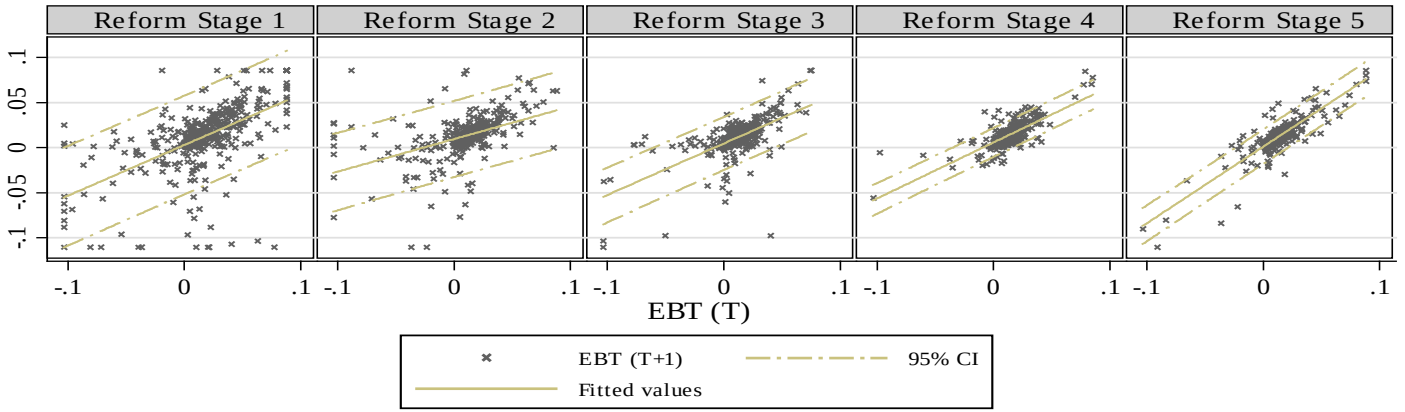
Figure 1 "Kink" around zero profit



This table reports the distribution of bank-year ROA for all observations in the *general sample*, with the exception of those with ROAs larger than 5% or small than -5% (a small portion of the population). Interval 1 is identified as the interval of small-positive earnings. The kink around the zero point provides the basis for us to treat it as the suspect group.

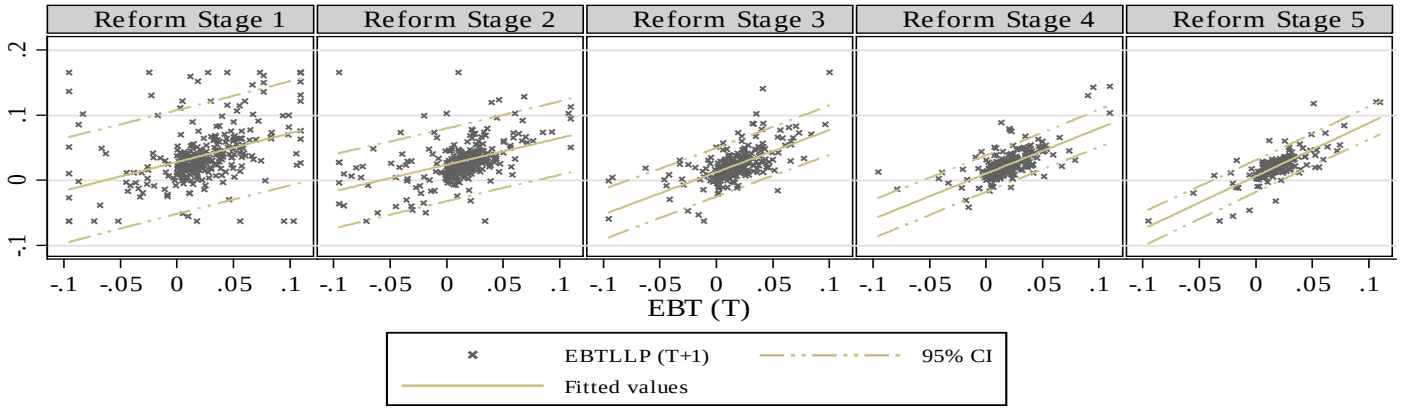
Other analyses of earnings quality by reform stage in the general sample*

Figure 2. Earnings Persistence by Reform Stage



Rank Correlation *between EBT(T+1) and EBT (T)*	Ktau	Spearman
Stage 1	0.483	0.634
Stage 2	0.465	0.605
Stage 3	0.496	0.646
Stage 4	0.553	0.718
Stage 5	0.630	0.800

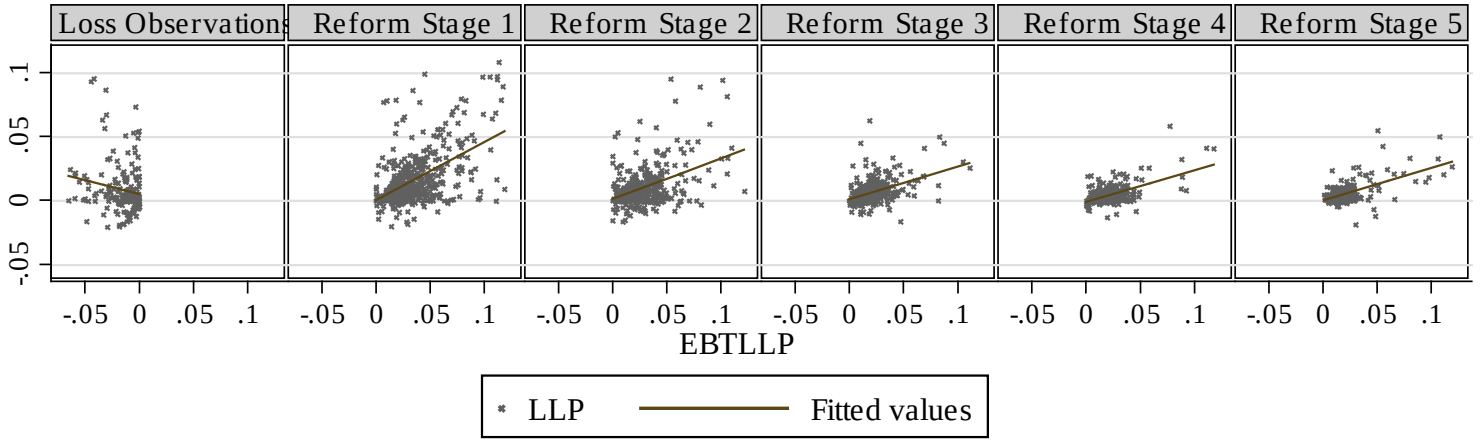
Figure 3. Predictability of Cash Flows by Reform Stage



Rank Correlation *between EBT(T+1) and EBTLLP (T)*	Ktau	Spearman
Stage 1	0.361	0.480
Stage 2	0.389	0.528
Stage 3	0.458	0.622
Stage 4	0.502	0.673
Stage 5	0.563	0.724

*The general sample consists of all bank-year observations where EBT and EBTLLP are available. Thus, it has broader coverage than our samples for multivariate analyses.

Figure 4.1 *LLP*-based Earnings Smoothing



Rank Correlation *between LLP(T) and EBTLLP (T)*	Ktau	Spearman
Loss	-0.101	-0.143
Stage 1	0.349	0.494
Stage 2	0.249	0.350
Stage 3	0.336	0.477
Stage 4	0.256	0.361
Stage 5	0.162	0.235

Figure 4.2 *LLP*-based Earnings Smoothing

Signs of ΔLLP & ΔPBTL

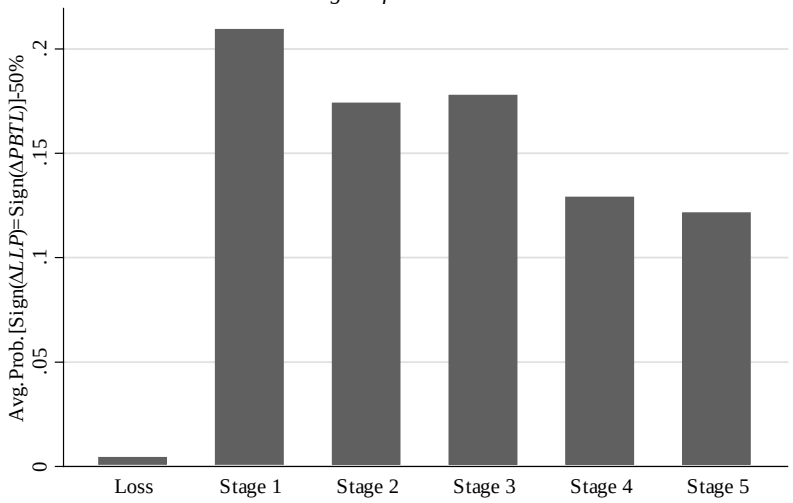
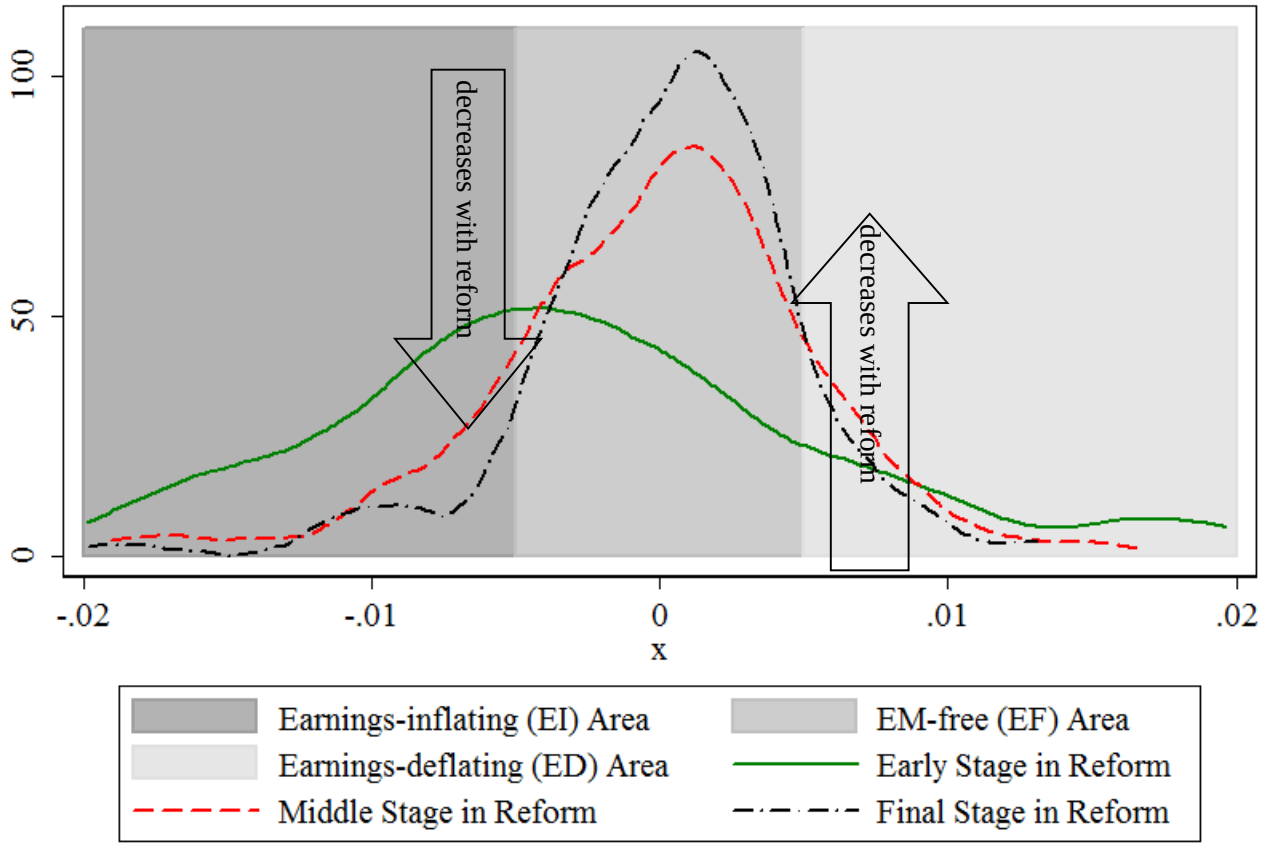


Figure 5 Impact of Reform on Different Types of *DLLP*



Test 4 in our main analyses is built on the rationale that earnings-inflating LLP is more likely the result of managerial self-serving behavior than the earnings-deflating counterpart. Figure 5 uses three lines to present the distribution of DLLP for banks in the early, middle, and final stages of reform. We create two areas based on signed *DLLP*: Earnings-inflating area consists of bank-year observations with *DLLP* < -0.5%; earnings-deflating area consists of bank-year observations with *DLLP* > +0.5%; and the region in the middle is referred to as the EM-free area because of its relatively small magnitude of *DLLP*.

Consistent with *H1*, country-years in the early reform stages (*index* ≤ *3*) are more likely to have earnings-inflating *DLLP* than those in the middle stages (3 < *index* < 4), which, in turn, are more likely than those in the final stage (*index* = 4). In contrast, the three have only small differences in earnings-deflating *DLLP*. Taken together, the results in the graph suggest that *banking reform* pushes banks from the earnings-inflating area into the EM-free area (from the left pane to the middle one).

Figure 6.1 Distribution of *ROA*--Early Stage

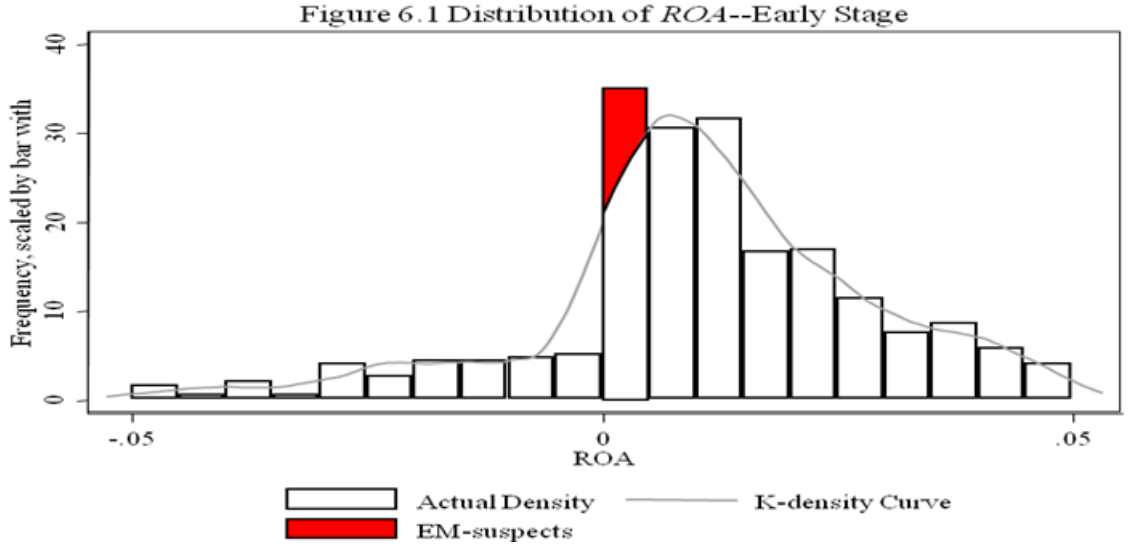


Figure 6.2 Distribution of *ROA*--Middle Stage

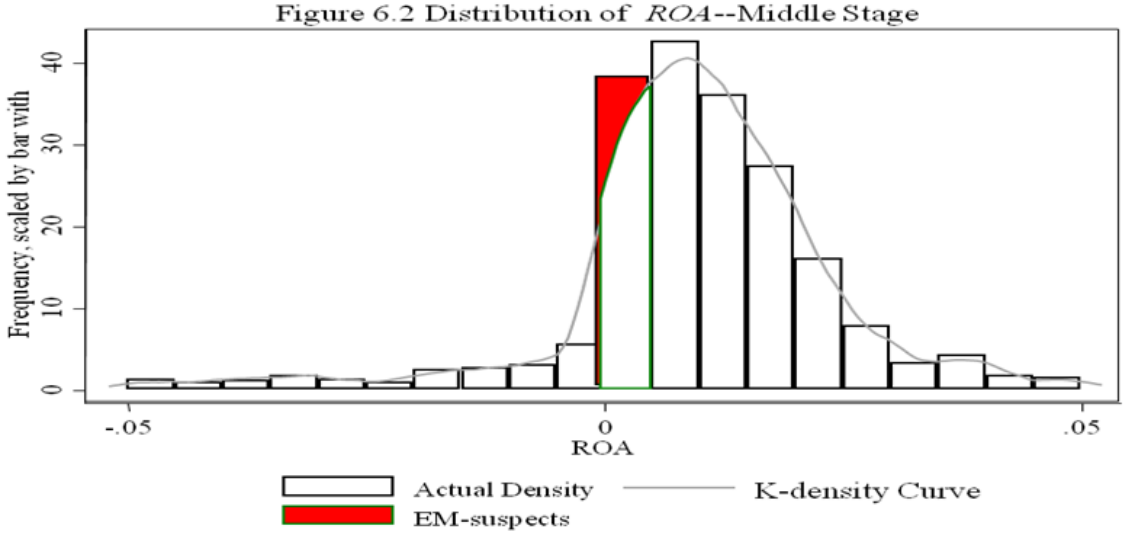
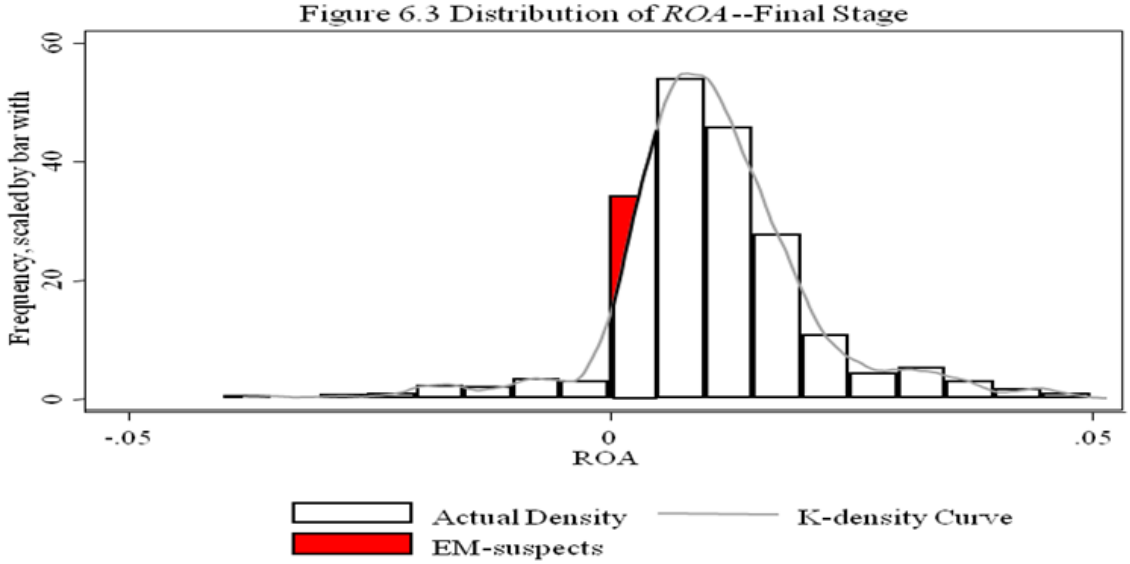


Figure 6.3 Distribution of *ROA*--Final Stage



Appendices

Appendix 1.1 Descriptive statistics (Sample II: Predictability of cash flows)

VARIABLE	Explanation	N	MEAN	MEDIAN	SD	MIN	MAX
Bank Reform	Banking Reform Index	1,185	3.374	3.330	0.454	2.330	4.000
Corp Reform	Corporate Reform Index	1,185	3.492	3.553	0.295	2.667	4.000
Creditor Rights	Creditor Rights	1,185	4.413	4.698	1.221	2.000	6.000
Corp Reform (r)	Corporate Reform Index (residual)	1,185	–0.007	–0.002	0.208	–0.617	0.682
RISK	Reverse Z-Score	1,185	–3.218	–3.317	1.201	–5.462	0.991
VOLATILITY	σ(ROA)	1,185	0.009	0.004	0.013	0.000	0.070
EBTLLP	Profit before Taxes and LLP/Total Assets	1,185	0.016	0.015	0.022	–0.068	0.083
EBT	Profit before Taxes/Total Assets	1,185	0.025	0.021	0.025	–0.039	0.130
SIZE	Ln_Assets	1,185	13.177	13.099	1.524	9.151	17.092
CAPITAL	Equity / Total Assets	1,185	0.125	0.100	0.083	0.027	0.611
DEPOSIT	Deposit / Total Assets	1,185	0.772	0.817	0.140	0.061	0.966
LOANS	Loan / Total Assets	1,185	0.523	0.548	0.184	0.031	0.927
CORP	Corporate Loans (%)	1,185	0.852	1.000	0.337	0.006	1.000
SHORT	Short-term Loans (%)	1,185	0.620	0.500	0.293	0.181	1.500
PUBLIC	Exchange Listed	1,185	0.331	0.000	0.471	0.000	1.000
CRISIS	Bank Crisis (D)	1,185	0.087	0.000	0.282	0.000	1.000
INFLTN	Inflation	1,185	5.780	4.607	4.690	0.102	45.667
DI	Deposit Insurance (D)	1,185	0.965	1.000	0.185	0.000	1.000
GDP	GDP per Capita Growth (%)	1,185	7.408	5.700	4.656	1.400	26.800

Appendix 1.2 Bank and macro characteristics by banking reform stage Sample II: Predictability of cash flows)

VARIABLE (V)	STAGE 1	STAGE 2	STAGE 3	STAGE 4	STAGE 5	STAGE 6	ρ (V, Reform)	ρ (V, Risk)
Bank Reform	2.330	2.670	3.000	3.330	3.670	4.000	1.000	–0.174
Corp Reform	3.000	3.131	3.297	3.506	3.683	3.715	0.771	–0.095
Creditor Rights	4.605	4.476	4.703	3.913	4.807	4.151	0.083	0.229
Corp Reform (r)	0.100	0.036	0.013	0.033	0.015	–0.143	0.000	0.082
RISK	–2.693	–3.182	–2.703	–3.118	–3.355	–3.642	–0.174	1.000
VOLATILITY	0.005	0.014	0.016	0.007	0.005	0.004	–0.311	0.578
EBTLLP	0.014	0.015	0.014	0.015	0.018	0.016	–0.011	–0.187
EBT	0.026	0.036	0.024	0.023	0.022	0.021	–0.209	–0.138
SIZE	12.665	12.184	12.651	13.493	13.466	13.759	0.366	–0.066
CAPITAL	0.078	0.188	0.137	0.110	0.101	0.112	–0.293	–0.152
DEPOSIT	0.907	0.721	0.771	0.777	0.798	0.771	0.151	0.131
LOANS	0.262	0.497	0.468	0.519	0.513	0.618	0.181	–0.202
CORP	1.000	0.959	0.928	0.883	0.815	0.700	–0.218	0.142
SHORT	0.500	0.679	0.695	0.627	0.567	0.571	–0.093	0.160
PUBLIC	0.000	0.449	0.292	0.283	0.284	0.388	–0.059	–0.170
CRISIS	0.000	0.101	0.151	0.091	0.033	0.091	–0.099	0.015
INFLTN	1.941	7.403	7.304	4.905	4.461	5.964	–0.290	0.075
DI	1.000	1.000	0.865	0.940	1.000	1.000	0.207	0.042
GDP	5.140	4.514	5.071	4.727	6.905	4.366	0.114	0.040
Observations	*5*	*198*	*192*	*265*	*306*	*219*		
Raw PREDICT.	–0.980	0.347	0.448	0.665	0.818	0.702		

This table reports the mean values of bank characteristics and macroeconomic conditions by reform stage. Reform stages 1-6 are classified based on six *Banking reform* scores: 2.33, 2.67, 3, 3.33, 3.67, and 4; *ρ* (*V, Reform*) is the correlation between each variable and *Banking reform* index; *ρ* (*V, Risk*) is the correlation between each variable and our bank *Risk* variable;

Raw PREDICT is NOT from the multivariate model (5). Instead, we run a simple regression of $EBTLLP_{t+1}$ on EBT_t (with an intercept) within each stage. The coefficient on EBT_t is the *Raw PREDICT* reported.

Appendix 2.1 Descriptive statistics (Sample III: LLP-based earnings smoothing)

VARIABLE	Explanation	N	MEAN	MEDIAN	SD	MIN	MAX
Bank Reform	Banking Reform Index	783	3.425	3.330	0.459	2.330	4.000
Corp Reform	Corporate Reform Index	783	3.508	3.553	0.292	2.667	4.000
Creditor Rights	Creditor Rights	783	4.283	4.678	1.218	2.000	6.000
Corp Reform (r)	Corporate Reform Index (residual)	783	–0.020	–0.030	0.219	–0.617	0.682
RISK	Reverse Z-Score	783	–3.499	–3.602	1.024	–5.462	0.166
VOLATILITY	σ(ROA)	783	0.006	0.003	0.007	0.000	0.070
LLP	Loan Loss Provision / Total Assets	783	0.008	0.005	0.012	–0.013	0.085
EBTLLP	Profit before Taxes and LLP / Total Assets	783	0.027	0.023	0.018	0.000	0.130
BEGLLA	Loan Loss Allowance / Total Loans	783	5.400	3.640	5.546	0.000	37.790
CHLOANS	Change in scaled LOANS	783	0.019	0.021	0.081	–0.355	0.376
LOANS	Loan / Total Assets	783	0.560	0.581	0.154	0.039	0.927
NPL	Non-Performing Loans / Total Loans	783	0.031	0.022	0.029	0.000	0.161
CHNPL	Change in NPL	783	–0.003	–0.001	0.015	–0.096	0.054
CORP	Corporate Loans (%)	783	0.818	1.000	0.367	0.006	1.000
SHORT	Short-term Loans (%)	783	0.598	0.500	0.295	0.181	1.500
GDP	GDP per capita Growth (%)	783	5.204	5.200	3.050	–4.600	12.200

Appendix 2.2 Bank and macro characteristics by banking reform stage (LLP-based earnings smoothing)

VARIABLE (V)	STAGE 1	STAGE 2	STAGE 3	STAGE 4	STAGE 5	STAGE 6	ρ (V, Reform)	ρ (V, Risk)
Bank Reform	2.330	2.670	3.000	3.330	3.670	4.000	1.000	–0.187
Corp Reform	3.000	3.148	3.300	3.477	3.691	3.692	0.771	–0.101
Creditor Rights	4.724	4.317	4.493	3.632	4.764	4.151	0.083	0.219
Corp Reform (r)	0.100	0.053	0.016	0.003	0.023	–0.165	0.000	0.090
RISK	–3.046	–3.461	–3.221	–3.407	–3.546	–3.723	–0.187	1.000
VOLATILITY	0.005	0.009	0.009	0.006	0.004	0.003	–0.311	0.570
LLP	0.019	0.017	0.011	0.008	0.004	0.004	–0.325	0.072
EBTLLP	0.026	0.043	0.030	0.025	0.022	0.022	–0.209	–0.118
BEGLLA	7.503	8.650	4.837	6.705	4.115	3.830	–0.254	0.170
CHLOANS	0.004	0.026	0.018	0.011	0.026	0.013	–0.016	–0.027
LOANS	0.351	0.517	0.530	0.556	0.562	0.611	0.181	–0.214
NPL	0.045	0.046	0.030	0.038	0.022	0.024	–0.285	–0.017
CHNPL	0.014	–0.008	–0.002	–0.002	–0.004	–0.002	0.012	0.022
CORP	1.000	0.953	0.893	0.850	0.795	0.679	–0.218	0.152
SHORT	0.500	0.635	0.673	0.654	0.539	0.548	–0.093	0.167
GDP	4.767	4.534	4.442	4.723	6.955	4.474	0.114	0.047
Observations	*3*	*121*	*105*	*163*	*212*	*179*		
Raw Smoothing	*1.226*	*0.442*	*0.256*	*0.232*	*0.133*	*0.005*		

This table reports the mean values of bank characteristics and macroeconomic conditions by reform stage. Reform stages 1-6 are classified based on six *Banking reform* scores: 2.33, 2.67, 3, 3.33, 3.67, and 4; ρ (*V, Reform*) is the correlation between each variable and *Banking reform* index; ρ (*V, Risk*) is the correlation between each variable and our bank *Risk* variable;

Raw Smoothing is NOT from the multivariate model that we rely on throughout the study. Instead, we run a simple regression of EBT_t and $EBTLLP_t$ (with an intercept) within each stage. The coefficient on $EBTLLP_t$ is the *Raw Smoothing* reported

Appendix 3.1 Descriptive statistics (Sample IV: earnings-inflating discretionary LLP)

VARIABLE	Explanation	N	MEAN	MEDIAN	SD	MIN	MAX
Bank Reform	Banking Reform Index	403	3.379	3.330	0.456	2.670	4.000
Corp Reform	Corporate Reform Index	403	3.482	3.553	0.285	2.667	4.000
Corp Reform (r)	Corporate Reform Index (residual)	403	–0.020	–0.030	0.224	–0.617	0.682
Creditor Rights	Creditor Rights	403	4.275	4.500	1.254	2.000	6.000
RISK	Risk Taking	403	–3.306	–3.427	1.102	–5.462	0.806
|DLLP|	|Discretionary LLP|	403	0.006	0.004	0.007	0.000	0.046
SIZE	Ln_Assets	403	13.393	13.308	1.546	9.549	16.779
GROWTH	Growth in Assets	403	0.261	0.187	0.330	–0.365	2.318
LLP	Loan Loss Provision / Total Assets	403	0.003	0.002	0.007	–0.013	0.032
EBTLLP	Profit before Taxes and LLP / Total Assets	403	0.023	0.022	0.019	–0.039	0.102
DEPOSIT	Deposit/Total Assets	403	0.761	0.792	0.122	0.250	0.943
PUBLIC	Exchange Listed	403	0.432	0.000	0.496	0.000	1.000
GDP	GDP per Capita Growth (%)	403	8.031	6.000	5.345	1.700	26.800

Sample IV only includes bank-years with negative Discretionary LLP (*DLLP*). We rely on Eq. (6) to estimate DLLP.

Appendix 3.2 Bank and macro characteristics by banking reform stage (Sample IV: earnings-inflating discretionary LLP)

VARIABLE (V)	STAGE 1	STAGE 2	STAGE 3	STAGE 4	STAGE 5	ρ (V, Reform)	ρ (V, Risk)
Bank Reform	2.670	3.000	3.330	3.670	4.000	1.000	–0.186
Corp Reform	3.158	3.305	3.492	3.666	3.673	0.771	–0.101
Corp Reform (r)	0.063	0.021	0.019	–0.002	–0.184	0.000	0.087
Creditor Rights	4.408	4.593	3.589	4.626	4.313	0.083	0.222
Risk	–3.417	–2.906	–3.089	–3.371	–3.711	–0.186	1.000
SIZE	12.172	13.195	13.790	13.765	13.687	0.366	–0.073
GROWTH	0.251	0.325	0.206	0.285	0.253	–0.099	0.004
LLP	0.006	0.004	0.003	0.002	0.002	–0.325	0.071
EBTLLP	0.031	0.023	0.018	0.022	0.022	–0.209	–0.124
DEPOSIT	0.696	0.746	0.769	0.808	0.766	0.151	0.120
PUBLIC	0.544	0.364	0.389	0.396	0.482	–0.059	–0.176
GDP	3.429	4.989	10.758	7.940	11.199	0.589	–0.247
Observations	*68*	*66*	*95*	*91*	*83*		
|DLLP|	*0.0105*	*0.0089*	*0.0065*	*0.0032*	*0.0037*	*–0.370*	*0.249*

This table reports the mean values of bank characteristics and macroeconomic conditions by reform stage. Reform stages 1-5 are classified based on six *Banking reform* scores: 2.67, 3, 3.33, 3.67, and 4; ρ (*V, Reform*) is the correlation between each variable and *Banking reform* index; ρ (*V, Risk*) is the correlation between each variable and our bank *Risk* variable;

|*DLLP*| is the absolute value of Discretionary LLP (*DLLP*). Residuals from estimations based on Eq. (8) (without the interaction terms) are our measures of *DLLP*.

Appendix 4.1 Descriptive statistics (Sample V: *small positive earnings*)

VARIABLE	Explanation	N	MEAN	MEDIAN	SD	MIN	MAX
Final Sample							
ROA	Return on Assets	1,202	0.010	0.010	0.020	–0.113	0.070
Bank Reform	Banking Reform Index	1,202	3.336	3.330	0.475	2.330	4.000
Corp Reform	Corporate Reform Index	1,202	3.448	3.443	0.314	2.557	4.000
Corp Reform (r)	Corporate Reform Index (residual)	1,202	–0.029	–0.030	0.215	–0.617	0.682
Creditor Rights	Creditor Rights	1,202	4.440	4.897	1.224	2.000	6.000
RISK	Risk Taking	1,202	–3.338	–3.431	1.161	–5.462	1.073
SIZE	Ln_Assets	1,202	13.035	12.921	1.573	9.151	17.092
GROWTH	Growth in Assets	1,202	0.286	0.207	0.348	–0.365	2.318
LOANS	Loan/Total Assets	1,202	0.531	0.554	0.181	0.031	0.927
CHCFE	Change in Pre-Tax&LLP Performance	1,202	–0.002	–0.001	0.023	–0.142	0.131
EBTLLP	Profit before Taxes and LLP / Total Assets	1,202	0.026	0.022	0.025	–0.039	0.130
LLR	Scaled Loan Loss Reserve	1,202	5.375	3.450	6.088	0.000	83.000
PUBLIC	Exchange Listed	1,202	0.347	0.000	0.476	0.000	1.000
GDP	GDP Per Capita Growth (%)	1,202	5.378	5.500	2.968	–4.600	12.200
General Sample							
ROA[0,+0.25%]	**Indicator Variable (Small Pos.)**	**2,515**	**0.082**	**0.000**	**0.274**	**0.000**	**1.000**
ROA[+0.25%,+0.5%]	Indicator Variable	2,515	0.087	0.000	0.282	0.000	1.000
ROA[+0.5%,+0.75%]	Indicator Variable	2,515	0.097	0.000	0.296	0.000	1.000
ROA[+0.75%,+1%]	Indicator Variable	2,515	0.110	0.000	0.313	0.000	1.000
ROA[-0.25%,0]	**Indicator Variable (Small Neg.)**	**2,515**	**0.011**	**0.000**	**0.103**	**0.000**	**1.000**
ROA[-0.25%,-0.5%]	Indicator Variable	2,515	0.010	0.000	0.101	0.000	1.000
ROA[-0.5%,-0.75%]	Indicator Variable	2,515	0.008	0.000	0.087	0.000	1.000
ROA[-0.75%, -1%]	Indicator Variable	2,515	0.010	0.000	0.097	0.000	1.000
Δ*ROA[0,+0.25%]*	**Indicator Variable (Small Pos.Δ)**	**2,515**	**0.130**	**0.000**	**0.336**	**0.000**	**1.000**
Δ*ROA[+0.25%,+0.5%]*	Indicator Variable	2,515	0.083	0.000	0.276	0.000	1.000
Δ*ROA[+0.5%,+0.75%]*	Indicator Variable	2,515	0.052	0.000	0.222	0.000	1.000
Δ*ROA[+0.75%,+1%]*	Indicator Variable	2,515	0.022	0.000	0.148	0.000	1.000
Δ*ROA[-0.25%,0]*	**Indicator Variable (Small Neg. Δ)**	**2,515**	**0.134**	**0.000**	**0.341**	**0.000**	**1.000**
Δ*ROA[-0.25%,-0.5%]*	Indicator Variable	2,515	0.079	0.000	0.269	0.000	1.000
Δ*ROA[-0.5%,-0.75%]*	Indicator Variable	2,515	0.051	0.000	0.221	0.000	1.000
Δ*ROA[-0.75%, -1%]*	Indicator Variable	2,515	0.031	0.000	0.172	0.000	1.000

To avoid the loss of statistic power, we first test H1 with a simple multinomial logistic regression (Eq. (9)) in a **GENERAL SAMPLE**, where observations are included as long as ROA is available. Furthermore, for robustness purposes, we include *Risk* and control variables into the model (see Eq. (10)) in spite of the inevitable drop in sample size (**FINAL SAMPLE**). This comprehensive model is also necessary for us to test H2.

	Current ROA interval		
	1	2	3
Figure ROA Interval 1 (Small-pos. interval)	2.0089***	1.5305***	0.3240
	(9.062)	(6.779)	(1.040)

Results are obtained from logistic regression: ROA Interval $1_{i,i+1} = \beta_1$ *ROA Interval* $1_{i,t} + \beta_2$*ROA Interval* $2_{i,t} + \beta_3$ *ROA Interval* $3_{i,t}$ *. Interval 1 is the small-positive suspect interval. Intervals 2 and 3 are the two closest intervals to the right of Interval 1*: *ROA[+0.25%,+0.5%] and ROA[+0.5%,+0.75%].** Significance level at 10% level. ** Significance level at 5% level. *** Significance level at 1% level, robust standard errors.

Appendix 4.2 Bank and macro characteristics by banking reform stage (Sample V: small positive earnings)

VARIABLE (V)	STAGE 1	STAGE 2	STAGE 3	STAGE 4	STAGE 5	STAGE 6	ρ (V, Reform)	ρ (V, Risk)
Bank Reform	2.330	2.670	3.000	3.330	3.670	4.000	1.000	–0.221
Corp Reform	3.000	3.083	3.297	3.468	3.668	3.693	0.771	–0.101
Corp Reform (r)	0.100	–0.012	0.013	–0.005	0.000	–0.164	0.000	0.127
Creditor Rights	4.835	4.533	4.716	3.859	4.850	4.048	0.083	0.198
ROA	0.008	0.006	0.007	0.010	0.012	0.012	0.045	–0.331
Risk	–3.160	–3.107	–2.758	–3.309	–3.600	–3.805	–0.221	1.000
SIZE	12.066	12.074	12.483	13.444	13.379	13.808	0.366	–0.097
GROWTH	0.293	0.294	0.362	0.256	0.304	0.209	–0.099	0.044
LOANS	0.327	0.500	0.476	0.541	0.535	0.612	0.181	–0.197
CHCFE	–0.009	–0.006	–0.002	–0.001	0.000	–0.001	0.047	–0.035
EBTLLP	0.027	0.037	0.024	0.023	0.022	0.022	–0.209	–0.150
LLR	7.098	7.510	5.877	6.545	3.449	3.925	–0.262	0.171
PUBLIC	0.000	0.406	0.279	0.345	0.318	0.400	–0.059	–0.159
GDP	4.800	4.735	4.885	5.045	7.075	4.446	0.114	–0.021
Observations	*10*	*251*	*197*	*220*	*314*	*210*		

Descriptive statistics are computed on the final sample.

Earnings Intervals	STAGE 1	STAGE 2	STAGE 3	STAGE 4	STAGE 5	STAGE 6	ρ (V, Reform)	ρ (V, Risk)
ROA[0,+0.25%]	0.087	0.078	0.094	0.116	0.055	0.064	–0.030	0.081
ROA[+0.25%,+0.5%]	0.033	0.081	0.055	0.095	0.108	0.109	0.062	–0.026
ROA[+0.5%,+0.75%]	0.054	0.071	0.062	0.124	0.122	0.121	0.082	–0.071
ROA[+0.75%,+1%]	0.054	0.067	0.092	0.127	0.155	0.126	0.093	–0.082
ROA[-0.25%,0]	0.033	0.007	0.011	0.017	0.004	0.012	–0.010	0.033
ROA[-0.25%,-0.5%]	0.000	0.014	0.006	0.019	0.002	0.012	–0.006	0.074
ROA[-0.5%,-0.75%]	0.000	0.009	0.011	0.002	0.008	0.010	0.004	0.058
ROA[-0.75%, -1%]	0.011	0.014	0.011	0.006	0.008	0.007	–0.023	0.079

Likelihood of small positive earnings, adjusted by nearby earnings intervals

	STAGE 1	STAGE 2	STAGE 3	STAGE 4	STAGE 5	STAGE 6
ROA[0,+0.25%] (*Adj. by Benchmark I*)	2.667	0.957	1.692	1.222	0.509	0.591
ROA[0,+0.25%] (*Adj. by Benchmark II*)	0.471	0.295	0.379	0.297	0.135	0.161
Observations	*92*	*566*	*469*	*474*	*509*	*405*

Results are based on the general sample.

Appendix 5 Other issues

	exp.	Capital	*exp.*	Government	*exp.*	Greenfield	exp.	Public
Persist.	+	1.589***	–	–0.465***	+	0.126	?	0.061
		(7.988)		(–5.455)		(1.570)		(0.661)
Predict.	+	1.283***	–	–0.422***	+	0.152	?	0.095
		(3.470)		(–3.834)		(1.569)		(1.006)
Smooth.	-	–0.158	+	–0.028	–	–0.141*	?	0.005
		(–0.516)		(–0.218)		(–1.775)		(0.056)
|DLLP|	-	0.0075	+	0.0001	–	–0.0015*	?	0.0006
		(0.890)		(0.086)		(–1.692)		(1.420)
Small Pos.	-	–8.366***	+	2.077***	–	–0.007	?	–0.9740***
		(–4.210)		(5.819)		(–0.011)		(–3.401)

BOFIT Discussion Papers

A series devoted to academic studies by BOFIT economists and guest researchers. The focus is on works relevant for economic policy and economic developments in transition / emerging economies.

2013
- No 1 Aaron Mehrotra: On the use of sterilisation bonds in emerging Asia
- No 2 Zuzana Fungáčová, Rima Turk Ariss and Laurent Weill: Does excessive liquidity creation trigger bank failures?
- No 3 Martin Gächter, Aleksandra Riedl and Doris Ritzberger-Grünwald: Business cycle convergence or decoupling? Economic adjustment in CESEE during the crisis
- No 4 Iikka Korhonen and Anatoly Peresetsky: What determines stock market behavior in Russia and other emerging countries?
- No 5 Andrew J. Filardo and Pierre L. Siklos: Prolonged reserves accumulation, credit booms, asset prices and monetary policy in Asia
- No 6 Mustafa Disli, Koen Schoors and Jos Meir: Political connections and depositor discipline
- No 7 Qiyue Xiong: The role of the bank lending channel and impacts of stricter capital requirements on the Chinese banking industry
- No 8 Marek Dabrowski: Monetary policy regimes in CIS economies and their ability to provide price and financial stability
- No 9 Rajeev K. Goel and Michael A. Nelson: Effectiveness of whistleblower laws in combating corruption
- No 10 Yin-Wong Cheung and Rajeswari Sengupta: Impact of exchange rate movements on exports: An analysis of Indian non-financial sector firms
- No 11 Martin Feldkircher, Roman Horvath and Marek Rusnak: Exchange market pressures during the financial crisis: A Bayesian model averaging evidence
- No 12 Alicia Garcia-Herrero and Le Xia: China's RMB bilateral swap agreements: What explains the choice of countries?
- No 13 Markus Eller, Jarko Fidrmuc and Zuzana Fungáčová: Fiscal policy and regional output volatility: Evidence from Russia
- No 14 Hans Degryse, Liping Lu and Steven Ongena: Informal or formal financing? Or both? First evidence on the co-funding of Chinese firms
- No 15 Iikka Korhonen and Anatoly Peresetsky: Extracting global stochastic trend from non-synchronous data
- No 16 Roman Horvath, Jakub Seidler and Laurent Weill: How bank competition influence liquidity creation
- No 17 Zuzana Fungáčová, Laura Solanko and Laurent Weill: Does bank competition influence the lending channel in the Euro area?
- No 18 Konstantins Benkovskis and Julia Wörz: What drives the market share changes? Price versus non-price factors
- No 19 Marcel P. Timmer and Ilya B. Voskoboynikov: Is mining fuelling long-run growth in Russia? Industry productivity growth trends since 1995
- No 20 Iftekhar Hasan, Liang Song and Paul Wachtel: Institutional development and stock price synchronicity: Evidence from China
- No 21 Iftekhar Hasan, Krzysztof Jackowicz, Oskar Kowalewski and Łukasz Kozłowski: Market discipline during crisis: Evidence from bank depositors in transition countries
- No 22 Yin-Wong Cheung and Risto Herrala: China's capital controls – Through the prism of covered interest differentials
- No 23 Alexey Egorov and Olga Kovalenko: Structural features and interest-rate dynamics of Russia's interbank lending market
- No 24 Boris Blagov and Michael Funke: The regime-dependent evolution of credibility: A fresh look at Hong Kong's linked exchange rate system
- No 25 Jiandong Ju, Kang Shi and Shang-Jin Wei: Trade reforms and current account imbalances
- No 26 Marco Sanfilippo: Investing abroad from the bottom of the productivity ladder – BRICS multinationals in Europe
- No 27 Bruno Merlevede, Koen Schoors and Mariana Spatareanu: FDI spillovers and time since foreign entry
- No 28 Pierre Pessarossi and Laurent Weill: Do capital requirements affect bank efficiency? Evidence from China
- No 29 Irina Andrievskaya and Maria Semenova: Market discipline and the Russian interbank market
- No 30 Yasushi Nakamura: Soviet foreign trade and the money supply
- No 31 Anna Krupkina and Alexey Ponomarenko: Money demand models for Russia: A sectoral approach

2014
- No 1 Vikas Kakkar and Isabel Yan: Determinants of real exchange rates: An empirical investigation
- No 2 Iftekhar Hasan, Krzysztof Jackowicz, Oskar Kowalewski and Łukasz Kozłowski: Politically connected firms in Poland and their access to bank financing
- No 3 Carsten A. Holz and Aaron Mehrotra: Wage and price dynamics in a large emerging economy: The case of China
- No 4 Zuzana Fungáčová, Anna Kochanova and Laurent Weill: Does money buy credit? Firm-level evidence on bribery and bank debt
- No 5 Jitka Poměnková, Jarko Fidrmuc and Iikka Korhonen: China and the World economy: Wavelet spectrum analysis of business cycles
- No 6 Christopher A. Hartwell: The impact of institutional volatility on financial volatility in transition economies: a GARCH family approach
- No 7 Christian Dreger, Tongsan Wang and Yanqun Zhang: Understanding Chinese consumption: The impact of hukou
- No 8 John Bonin, Iftekhar Hasan and Paul Wachtel: Banking in transition countries
- No 9 Chun-Yu Ho: Switching cost and deposit demand in China
- No 10 Zuzana Fungáčová and Laurent Weill: Understanding financial inclusion in China
- No 11 Anna Krupkina, Elena Deryugina and Alexey Ponomarenko: Estimating sustainable output growth in emerging market economies
- No 12 Qing He, Chang Xue and Chenqi Zhu: Financial Development and patterns of industrial specialization: Regional evidence from China
- No 13 Carsten A. Holz: Wage determination in China during the reform period
- No 14 Thorsten Beck, Hans Degryse, Ralph De Haas and Neeltje van Horen: When arm's length is too far. Relationship banking over the business cycle
- No 15 Boris Blagov and Michael Funke: The credibility of Hong Kong's currency board system: Looking through the prism of MS-VAR models with time-varying transition probabilities
- No 16 Philip Molyneux, Hong Liu and Chunxia Jiang: Bank capital, adjustment and ownership: Evidence from China
- No 17 Yin-Wong Cheung and Dagfinn Rime: The offshore renminbi exchange rate: Microstructure and links to the onshore market
- No 18 Marko Melolinna: What is the role of Emerging Asia in global oil prices?
- No 19 Yiwei Fang, Iftekhar Hasan and Lingxiang Li: Banking reform, risk-taking, and earnings quality - Evidence from transition countries

www.bof.fi/bofit

ISSN 1456-4564 (print) // ISSN 1456-5889 (online)