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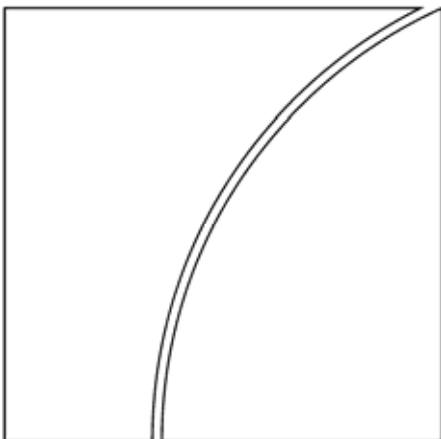
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# Do accounting changes affect the economic behaviour of financial firms?

by Anne Beatty

Monetary and Economic Department

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## **Foreword**

On 11-12 November 2005, the BIS held a Workshop on “Accounting, risk management and prudential regulation”, which brought together a multi-disciplinary group of around 35 external participants including senior accounting practitioners, standard setters, finance academics, supervisors and central bank officials. The workshop programme is attached. This paper was presented at the workshop. The views expressed are those of the author(s) and not those of the BIS.



## **Abstract**

This study examines whether accounting changes result in changes in the economic behaviour of financial institutions. The results of several papers examining how banks respond to accounting changes that affect their regulatory capital ratios are consistent with Furfine's (2000) summary that "capital regulation, broadly speaking, can significantly influence bank decision-making." These papers do not attempt to disentangle the effects of capital regulation versus market discipline. This paper examines banks' response to recent changes in accounting for Trust Preferred Securities that effect how these securities are reported in the balance sheet but do not change the calculation of Tier 1 capital. This provides a good setting to examine whether accounting changes induce changes in banks' economic behaviour in the absence of an effect on regulatory capital. I test five hypotheses related to banks' decisions to issue Trust Preferred Stock during the period from 1997 through 2004. Specifically, I examine whether there was an overall decrease in banks' propensity to issue these securities after the accounting change, whether publicly traded banks and those that access the external debt markets were more likely to issue these securities before the accounting change but not after, and whether banks with low regulatory capital ratios and with high marginal tax rates were more likely to issue these securities both before and after the accounting change. The results suggest that accounting changes can lead to changes in banks' economic behaviour even when the change in accounting does not affect regulatory capital calculations. This is consistent with bank managers acting as if they are concerned with the markets' response to the numbers reported after the accounting change.



# Workshop on “Accounting, risk management and prudential regulation”

Room D, Bank for International Settlements  
11-12 November 2005, Basel

Friday, 11 November 2005

Welcome by Malcolm Knight, General Manager, BIS

**Session 1: Chairperson: William White, BIS**

**Paper 1: “Including estimates of the future in today’s financial statements”**

by Mary Barth, Professor of Accounting, Stanford University

Discussants: Russell Picot, Group Chief Accounting Officer, HSBC Holdings London  
Arnold Schilder, Executive Director of Supervision, Netherlands Bank

**Paper 2: “Fair value accounting for financial instruments: some implications for bank regulation”**

by Wayne Landsman, Professor of Accounting, University of North Carolina

Discussants: James O’Brien, Senior Economist, Division of Research and Statistics, Board of Governors of the Federal Reserve System  
Thomas Daula, Chief Risk Officer, Morgan Stanley New York

**Session 2: Chairperson: Sylvie Mathérat, French Banking Commission**

**Paper 3: “Institution-specific value”**

by Ken Peasnell, Professor of Accounting and Finance, Lancaster University Management School

Discussants: Philip Lowe, Assistant Governor, Financial System, Reserve Bank of Australia  
David Andrews, Director, Fitch Ratings Ltd

**Paper 4: “Do accounting changes affect the economic behaviour of financial firms?”**

by Anne Beatty, Professor of Accounting, Ohio State University

Discussants: Patricia Jackson, Ernst and Young, London  
Gerard Gil, Group Chief Accountant, BNP Paribas

## **Saturday, 12 November 2005**

**Session 3: Chairperson: José Maria Roldán, Banco de España**

**Paper 5: “Implications of marking to market for market/system behaviour”**

by Hyun Shin, Professor of Finance, London School of Economics

Discussants: Mauro Grande, Director, Financial Stability and Supervision,  
European Central Bank  
Richard Herring, Professor of Finance,  
Wharton University of Pennsylvania

**Paper 6: “Risk in financial reporting: status, challenges and suggested directions”**

by Claudio Borio, Head of Research and Policy Analysis and  
Kostas Tsatsaronis, Head of Financial Institutions and Infrastructure,  
Bank for International Settlements

Discussants: Gerald Edwards, Jr, Financial Stability Forum  
Philippe Jorion, Professor of Finance, University of California – Irvine

**End of Conference**



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# Do accounting changes affect the economic behaviour of financial firms?<sup>1</sup>

Anne Beatty<sup>2</sup>

## Introduction

The introduction of explicit numerical regulatory capital requirements by US federal banking agencies in 1981 created a direct link between financial reporting standards and regulatory capital adequacy. This link was strengthened by the requirement in the Federal Deposit Insurance Corporation Improvement Act of 1991 (FDICIA) that regulatory accounting standards be no less stringent than Generally Accepted Accounting Principles (GAAP). The use of reported accounting numbers in determining capital adequacy creates an incentive for banks to alter their economic behaviour when there are changes in accounting standards. Evidence consistent with banks responding to this incentive has been documented for the change in accounting from amortised cost to fair value accounting for investment securities and for the change in accounting standards requiring consolidation of banks' asset-backed commercial paper conduits.

Banks may have additional incentives to alter economic behaviour in response to accounting changes even in circumstances where the change in accounting standards are not incorporated explicitly in regulatory capital ratios. These incentives will depend on the response of market participants to the changes in financial reports resulting from changes in accounting standards. Caruana (2004) discusses the importance of accounting standards in facilitating "market discipline by promoting transparent financial reporting of banks' financial position and performance, risk exposures and risk management activities." The Basel II capital accord incorporates these ideas by including market discipline as one of the three pillars of effective bank supervision. There is less evidence about whether accounting changes induce changes in economic behaviour in non-regulated firms or in banks when their regulatory capital ratios are unaffected by the accounting change.

I examine this issue by focusing on recent changes in the accounting for Trust Preferred Securities (TPS). McKinnon and Hitt (2002) report that these securities were invented in 1993 by Goldman Sachs to provide an "irresistible combination" of debt and equity. "For the tax man, it resembled a loan, so that interest payments could be deducted from taxable income. For shareholders and rating agencies, who look at overleveraged companies, it resembled equity." The October 1996 Federal Reserve ruling that allowed TPS to be included in Tier 1 capital provided an additional inducement for banks to offer these securities.

Two changes in accounting standards adopted in 2003 eliminated the potential financial reporting advantages of TPS. First, the adoption of SFAS 150 in May of 2003 required bank holding companies to reclassify mandatorily redeemable capital securities such as TPS from the equity to the liabilities section of the balance sheet. Dividends paid on these financial instruments, previously classified as non-interest expense, were required to be reclassified

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<sup>1</sup> I would like to thank Jennifer Altamuro, Mary Barth, Dan Bens, Shane Heitzman, Alan Jagolinzer, Cathy Schrand, Joe Weber and seminar participants at the University of Arizona for their helpful comments.

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as interest expense. Second, FIN 46R, which was effective 31 December 2003, required the deconsolidation of trusts that issued trust preferred securities. By reclassifying these securities from the equity to the liabilities section of the balance sheet, these accounting changes took away the financial reporting benefit of issuing these securities. However, the regulatory capital advantages of these securities were not affected by the accounting changes because the FED allowed the continued inclusion of these securities in the calculation of Tier 1 capital.

The difference between the financial reporting and regulatory capital treatment of TPS after these accounting changes makes this a good setting to examine whether accounting changes induce changes in banks' economic behaviour in the absence of a regulatory capital effect. To mitigate concerns that observed changes might be driven by changes in the demand for TPS, I examine not only the average change in behaviour but also how changes in behaviour vary cross-sectionally with banks' financial reporting and regulatory capital characteristics. While this analysis cannot eliminate the possibility that observed changes are driven by changes in demand it makes it less likely that the results were driven by a reduction in the real economic benefits of issuing TPS.

I test five hypotheses related to how banks' financial reporting, regulatory capital and tax concerns affected their decision to issue TPS during the period from 1997 through 2004. Specifically, I examine whether there was an overall decrease in banks' propensity to issue these securities after the accounting change, whether banks required to file with the SEC and those that access the external debt markets were more likely to issue these securities before the accounting change but not after, and whether banks with low regulatory capital ratios and high marginal tax rates were more likely to issue these securities both before and after the accounting change. I focus primarily on the decision to issue new TPS rather than on the decision to redeem existing TPS because issuers are typically prohibited from calling the TPS during the first five years after the issuance date. This restriction prevents banks from redeeming recently issued TPS even if they have the economic incentives to do so. I conduct a supplementary analysis of redemptions that occurred after the accounting change.

I perform a logistic regression of the decision to issue TPS on the hypothesised factors along with several control variables designed to capture shifts in behaviour caused by macro-economic changes during the period of the accounting changes. The results of these tests suggest that there was a decline in the issuance of TPS after the change in the accounting standards. Banks that are not required to file with the SEC were less likely to issue these securities in the period before the accounting changes, but this differential was eliminated after the accounting changes. Similarly, banks that access external debt markets were more likely to issue trust preferred shares prior to the accounting changes, but not after. Finally, banks with low regulatory capital were more likely to issue TPS before and after the accounting change.

These results suggest that accounting changes can lead to changes in banks economic behaviour even when the change in accounting does not affect regulatory capital calculations. This is consistent with bank managers acting as if they are concerned with the markets' response to the numbers reported after the accounting change. The results of this paper should be of interest to accounting standard setters who are concerned with the effects of changing accounting standards on economic behaviour and to bank regulators interested in the effectiveness of market discipline as part of the supervision and regulation of banks.

The rest of this paper is organised as follows. In the next section I provide background on TPS and discuss related research. Section 3 develops hypotheses, and section 4 discusses the research design. In section 5, I describe the sample selection and provide descriptive statistics. Section 6 includes the results and Section 7 contains conclusions.

## Background

### Accounting changes and economic behaviour

Critics of changes in accounting standards, which are often designed to improve the information available to users of the financial statements, often argue against the changes because they will result in changes in the reporting firms' economic behaviour. A recent example of these arguments occurred during a Congressional Hearing of the Committee on Financial Services. In that hearing, US Representative Royce argued that "Economic behaviour has already changed as a result of the FASB's employee stock option expensing proposal." An earlier example can be found in a 1990 letter from Federal Reserve Chairman Alan Greenspan to the chairman of the SEC when they were considering fair value accounting for investment securities. He states that "the adoption of market-value accounting for the investment securities portfolio might also affect the amount of securities that banks are willing to hold. Many institutions would likely reduce their holdings of marketable instruments, thereby having the undesired effect of reducing the liquidity of banking organisations." Similar concerns have been expressed about many other proposed accounting changes.

Consistent with these concerns Sandy Burton, former SEC Chief Accountant is quoted in a Forbes.com (3/15/77) article as saying "There is no doubt that measurement standards have an impact on behaviour. That impact cannot be ignored in setting measurement standards. There's a delicate balance you have to have."

Despite these frequently raised concerns there has generally been very little published research in accounting that has documented that firms actually change their economic behaviour in response to accounting changes. Less than ten percent of the studies focusing on FASB accounting standards published in the top three academic accounting journals (ie Accounting Review, Journal of Accounting and Economics and Journal of Accounting Research) examine the effects that these accounting standards have on firms' economic behaviour. A majority of the studies consider valuation issues and roughly a quarter of the studies examine accounting choices firms make when adopting the standard. More than half of the studies of changes in economic behaviour focus on SFAS 2, requiring the expensing of Research and Development expenditures, with mixed results. Some studies report findings supporting a shift in economic behaviour and others are unable to document any change in behaviour.

The explanation for why there is so little emphasis on this seemingly important research question is not obvious. One possibility is that this research has been undertaken but that accounting changes do not actually lead to changes in economic behaviour. A bias against publishing null results may have led to few of these studies appearing in these journals. Another possibility is that the difficulty in documenting these changes in behaviour convincingly may be too discouraging. In any event, generally there is very little evidence on changes in firm behaviour in response to accounting changes.<sup>3</sup>

### Banks' responses to accounting changes that affect regulatory capital ratios

A large number of papers have examined how banks respond to changes in regulatory capital requirements. In their review of the literature examining the impact of the Basel accord on bank behaviour, Jackson et al. (1999) emphasise the difficulty in disentangling the

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<sup>3</sup> Two current working papers by Altamuro (2005) and Marquardt and Wiedman (2005) examine how non-financial firms' economic behaviour changes in response to accounting changes.

effects of capital regulation and market discipline. In discussing this literature, Furfine (2000) states that these papers lend support to the notion that “capital regulation, broadly speaking, can significantly influence bank decision-making. These results suggest that any debate on new capital regulations should consider the possible impact of changing the economic incentives given to the banks being regulated.” In addition to these papers that have looked at how banks respond to changes in capital regulation, several papers have examined how banks respond to accounting changes that affect their regulatory capital ratios. Two of these papers examine how banks responded to a change in accounting standards requiring fair value accounting for investment securities. At the time that this standard was adopted, the Board of Governors of the Federal Reserve System had proposed that capital requirements be amended to include unrealised holding gains on losses on available-for-sale securities in Tier 1 capital. Beatty (1995) finds that bank holding companies decreased both the proportion and maturity of investment securities held in the quarter when they adopted SFAS 115. These results suggest that banks’ behaviour does respond to changes in accounting standards if those changes are expected to affect regulatory capital ratios. Using a slightly different research design, Hodder, Kohlbeck and McAnally (2002) reach similar conclusions.

Further evidence suggesting that banks alter their economic behaviour in response to accounting changes that affect regulatory capital ratios is provided by Bens and Monahan (2005). They examine changes in banks’ asset-backed commercial paper conduits after the change in accounting standards requiring consolidation of variable interest entities. At the time that this accounting change took effect the Federal Reserve ruled that, although the reported assets resulting from consolidating these entities would receive a zero weight in determining risk based capital ratios, the resulting increase in assets would be included in calculating the leverage ratio. They find a decline in the volume of US banks’ sponsorship in asset-backed commercial paper that corresponds to this accounting change and that US banks entered into “costly restructuring arrangements to avoid having to consolidate their conduits.”

These papers suggest that changes in capital regulation including those caused by changes in the accounting standards that are included in determining capital ratios can result in changes in economic behaviour. These studies do not explore whether accounting changes that are not included in regulatory capital ratios will also result in changes in bank behaviour due to the effect that these accounting changes have on market discipline.

### **Trust preferred stock**

Crain and Jackson (1996) provide a nice summary of the basic structure of TPS. First the parent company sets up a one hundred percent owned limited life corporation. This subsidiary sells preferred shares to individual investors. The proceeds of the sale are loaned to the parent. The parent pays interest on the loan which can then be used to pay dividends on the preferred shares. Since the subsidiary has a limited life it is not consolidated for tax purposes, the parent receives a tax deduction for the interest paid to the subsidiary.

Prior to the change in accounting standards in 2003, the subsidiary was consolidated for financial reporting purposes eliminating the intercompany debt. The parent reported the preferred shares issue by the subsidiary to outside investors as minority interest, which was typically classified either in the equity or mezzanine sections of the balance sheet. SFAS 150, which was issued in May 2003, changed the balance sheet classification of TPS by requiring that mandatorily redeemable financial instruments be classified as a liability of the issuing company if the issuer is unconditionally obligated to redeem the shares by transferring assets at a specified or determinable date. FIN 46, which was issued in December of 2003, further changed the accounting for TPS by requiring that the trusts be deconsolidated in the financial statements, since the majority of the risks inherent in the trust are borne by the holders of the TPS. The result of deconsolidation is for the parent to report

the subordinated debt issue in liabilities and to report any equity investment in the trust as investments in unconsolidated subsidiaries.

Poppa (2004) discusses that this change in accounting rules raised the question of whether the Federal Reserve would change its capital guidelines with respect to TPS, because the subordinated debt shown on the balance sheet would ordinarily only qualify as tier 2 rather than tier 1 capital. In May of 2004 the Federal Reserve Board issued a proposed rule that would continue to allow trust preferred securities to be included in tier1 capital. The final ruling confirming that position was issued in March of 2005.

### **Literature review**

Engel, Erickson, and Maydew (1999) examine the financial reporting and tax benefits of trust preferred stock for a sample of 158 issuances made between 1993 and December of 1996 by industrial and financial firms. Based on their analysis of 44 issuances that were used to retire debt they conclude that firms are willing to incur “substantial costs” to “manage the balance sheet classification of a security.” The costs include direct costs of issuing the trust preferred stock and the indirect costs of paying a higher yield than on the debt that was being retired. They also document that firms that issue the securities and retire preferred stock are able to achieve “substantial tax savings.”

Benston, Irvine, Rosenfeld and Sinkey (2003) examine whether issuing TPS enhances stockholder wealth and why some bank holding companies issue and others do not. Their sample is comprised of publicly traded bank holding companies with data on CRSP and includes 224 observations in 1996 and 256 observations in 1997. Of these sample companies 25 issued trust preferred in 1996 and 40 issued trust preferred in 1997. They consider five hypotheses related to the issuance of trust preferred. Specifically, they examine tax savings, reduction in costs of financial distress, growth opportunities, moral-hazard and transactions costs hypotheses. They find a positive stock-market reaction to both the Fed’s ruling to allow trust preferred as tier 1 capital and the trust preferred filings. The stock price reaction is significant for the 54 banks that use the proceeds to increase tier 1 capital and not significant for the 11 who do not. Banks that issue trust preferred were larger in asset size, paid more taxes, had more foreign deposits, had higher asset growth, and had lower capital ratios.

Harvey, Collins and Wansley (2003) examine the stock and debt markets’ reactions to the Federal Reserve’s announcement that trust preferred shares would be included as a component of Tier 1 capital. They argue that the stock market should respond favourably to the associated tax savings while the debt market should respond favourably if the trust preferred stock provides a cushion for debt with higher seniority. They find a positive stock price reaction, but document little reaction in the debt market.

Krishnan and Laux (2005) examine the short-run and long-run stock price reaction to 210 issuances of trust preferred shares made between 1993 and 2000. They find that there is a short-run market misreaction to the announcement for issues that do not have focal benefits, which are the benefits that are prominent in the design and marketing to issuers of TPS.

It is not obvious based on the results of these studies whether the change in accounting for TPS is likely to result in a change in banks’ decisions to issue these securities. To the extent that banks were incurring substantial costs to manage the balance sheet classification of the security, it seems likely that the change in accounting for these securities would lead to a reduction in the extent to which banks issue TPS. Alternatively, if the market reaction to these securities was not related to the balance sheet classification, then it is unclear whether banks would alter their behaviour as a result of the accounting changes.

## Hypothesis development

Mckinnon and Hitt (2002) report that “Lynn Turner, the SEC's chief accountant from 1998–2001, said TPS are an example of the aggressive accounting that grew in frequency during the 1990s while regulators dawdled. ‘As a result, we have balance sheets getting much better credit ratings than they should, and companies looking more liquid and in much better financial shape than they are,’ he said.”

The changes in the accounting for TPS resulting from the adoption of SFAS 150 and FIN 46R eliminated any financial reporting advantage associated with classifying these securities as equity rather than liabilities. To the extent that the accounting treatment of TPS was important in the decision to issue these securities that incentive would be reduced by these accounting changes. This argument yields the following hypothesis:

*H1: Companies will be more likely to issue TPS during the period when the TPS can be classified as equity compared to the period when it must be classified as debt on the balance sheet.*

Previous research finds that financial reporting incentives differ for publicly traded firms versus those that are privately held. Beatty and Harris (1999) find that publicly traded bank holding companies are more likely to recognise gains on sales of securities to smooth reported earnings than are privately held firms. Beatty, Ke and Petroni (2002) find that publicly traded bank holding companies are more likely to use the loan loss provision and gains on sales of securities to meet earnings benchmarks. The results of both of these studies indicate that the accounting treatment of TPS may be more important in the decision to issue these securities for publicly traded companies. These arguments lead to the following hypothesis:

*H2: Publicly traded companies will be more likely than those that are privately held to issue TPS during the period when trust preferred stock could be classified as equity on the balance sheet, but not in the period after the accounting change.*

The Basel Committee on Banking Supervision has identified market discipline as one of the three pillars of effective regulatory oversight. When discussing the bank safety net, Greenspan (2001) states that “we need to adopt policies that promote private counterparty supervision as the first line of defence for a safe and sound banking system.” Meyer (1999) discusses two types of market discipline, direct and indirect. Direct market discipline is exerted when the expected cost of issuing financial instruments increases with risk. Indirect market discipline is exerted when other parties such as regulators monitor the markets’ risk assessment and take actions when risk rises.

Although much of banks’ liabilities are comprised of insured deposits, which pay interest rates that do not reflect the banks’ riskiness, market discipline can arise in the non-insured liabilities of banks. Flannery and Nikolova (2003) discuss that the notion that uninsured obligations would reflect risk may not be as obvious for banks as it is for other industries for two reasons. First, they argue that risk will only be incorporated in the rates if regulators require private investors to bear the costs of their bank becoming more likely to fail. They state that “obviously, a supervisory system that provides implicit guarantees against creditor losses cannot expect to secure much benefit from market discipline.” Second, they argue that banks may be inherently more difficult to understand from the outside than are firms in other industries because the nature of banks’ business and the accounting for banks may be less transparent. In the extreme these possibilities might result in banks’ uninsured liabilities being as insensitive to risk as their insured obligations. However, the empirical findings summarised by Flannery and Nikolova (2003) suggest that this is not the case. They discuss the results of a number of studies that have found evidence that the rates on banks’ uninsured subordinated notes and debentures, uninsured CDs, and federal funds reflect differences in credit risk across borrowers. Although these studies document that banks’



uninsured liabilities are sensitive to risk, they do not attempt to establish whether the market incorporates the risk correctly.

Nier and Bauman (2003) argue that the extent to which market discipline affects bank behaviour is an important question for bank regulators. They argue that “to the extent that the New Basel Accord shifts some of the burden of bank oversight from supervisors to markets, it is important to ascertain whether market discipline can be effective, and under what conditions it might not be.” They further argue that the “theoretical framework suggests that the effectiveness of market discipline in containing excessive risk-taking hinges on 1) the extent of the government safety net 2) the degree to which the bank is financed by uninsured liabilities and 3) the extent of observability of bank risk choices.” Within the US the extent of the government safety net is not likely to vary across banks. I therefore focus on the second and third factors. Specifically, market discipline should be more important for firms with more uninsured liabilities when risk is more difficult to assess.

*H3: Companies that access the external debt market will be more likely to issue TPS during the period when TPS could be classified as equity on the balance sheet, but not in the period after the accounting change.*

Dobbins (2000) outlines the following characteristics required for TPS to qualify for inclusion in Tier 1 capital under the Fed’s October 1996 ruling: 1) Ability to defer payment of cash distributions to security holders for up to five years 2) Cumulative cash distributions to shareholders of longest maturity date available (at least 30 years) 3) Deep subordination to the issuer’s other debt 4) Issuance cannot exceed 25 percent of bank holding companies’ tier 1 equity.

On 4 May 2004 the Fed issued a press release requesting comments on a proposed rule that would retain TPS in tier 1 capital. The Fed stated that the proposal was issued to address “supervisory concerns, competitive equity considerations, and recent changes in accounting for trust preferred securities under generally accepted accounting principles (GAAP).” On 1 March 2005 the Fed announced the adoption of a final rule that allows the continued inclusion of TPS in tier 1 capital.

In discussing the regulatory treatment of TPS the Fed stated that

“The change in the GAAP accounting of a capital instrument does not necessarily change the regulatory capital treatment of that instrument. Although GAAP informs the definition of regulatory capital, the Federal Reserve is not bound by GAAP accounting in its definition of tier 1 or tier 2 capital because these are regulatory constructs designed to ensure the safety and soundness of banking organisations, not accounting designations designed to ensure the transparency of financial statements. The current definition of tier 1 capital differs from GAAP equity in a number of ways that the Federal Reserve has determined are consistent with its responsibility for ensuring the soundness of the capital bases of banking organisations under its supervision. These differences do not constitute differences between regulatory reporting and GAAP accounting requirements, but rather are differences only between GAAP equity and the concept of tier 1 capital as used in the Board’s regulatory capital requirements for banking organisations.”

The regulatory capital treatment of TPS provides an incentive for banks with lower regulatory capital to issue TPS to maintain capital adequacy. Since the regulatory treatment of TPS was unaffected by the accounting treatment for these securities this incentive should be similar across both accounting regimes.

*H4: Companies with lower regulatory capital will be more likely to issue TPS during both accounting periods.*

Engel, Erickson and Maydew (1999) document that firms also issue TPS to achieve “substantial tax savings.” The tax treatment of TPS when compared to that of other preferred stock provides an incentive for firms with higher marginal tax rates to prefer TPS.

*H5: Companies with higher marginal tax rates will be more likely to issue TPS during both accounting periods.*

## Research design

To test these five hypotheses I run the following logistic regression:

$$\begin{aligned} \text{Issue} = & \alpha + \beta_1 \text{Post} + \beta_2 \text{Public} + \beta_3 \text{Public} * \text{Post} + \beta_4 \text{Debt} + \beta_5 \text{Debt} * \text{Post} + \beta_6 \text{Capital} \\ & + \beta_7 \text{Capital} * \text{Post} + \beta_8 \text{LowCap} + \beta_9 \text{LowCap} * \text{Post} + \beta_{10} \text{Tax} + \beta_{11} \text{Tax} * \text{Post} \\ & + \beta_8 \text{Loans} + \beta_9 \text{Size} + \beta_{10} \text{NoPool} + \varepsilon \end{aligned}$$

### *Variable definitions*

All variables other than the issue variable are calculated as of the beginning of the period to ensure that the measurement of the variables is not affected by the TPS issuance:

**Issue:** a dichotomous variable equal to 1 if TPS (BHCKA507) is reported in the current year and not in the previous year and equal to zero if TPS equals zero.

**Post:** dichotomous variable equal to 1 if the observation is from 2004 and equal to zero otherwise.

**Public:** dichotomous variable equal to one if the company files with the SEC (RSSD9056=1) and equal to zero otherwise.

**Debt** the sum of commercial paper, subordinated notes and debt, and other short-term and long-term borrowed money divided by total liabilities ((BHCK2309+BHCK4062+BHCK2332+BHCK2333)/(BHCK2170-BHCK3210)).

**Capital:** the leverage ratio (BHCK8274)/(BHCKA224).

**Lowcap:** dichotomous variable equal to one if Capital is less than the sample median value (8.6%) and equal to zero otherwise.

**Tax:** the ratio of tax expense to pretax income (BHCK4302/ (BHCK4302 + BHCK4340)).

**Loans:** total loans divided by total assets (BHCK2122/BHCK2170).

**Size:** log of total assets (BHCK2170).

**NoPool:** a dichotomous variable equal to 1 for years prior to 2000, which is the year of the first Trust Preferred Pool offering.

The logit regression is estimated using data from 1997, the first year after the Fed allowed TPS to be included in tier 1 capital, through 2004. Since there are multiple years in the pre-accounting change period one observation per firm not issuing TPS is randomly drawn for that period. This reduces concerns about lack of independence in the observations.

Three control variables are included in the model in addition to the variables included to test the five hypotheses. Specifically, the fraction of assets held in loans is included to capture macro-economic changes during the period, the log of total assets is included to control for differences in bank size, and a dichotomous variable set equal to one for 1997-1999 is included to capture the fact that pooled trust security offerings did not yet exist during these two years.

## Sample selection and descriptive statistics

A sample of bank holding companies was identified from the consolidated financial statement for the bank holding companies report (FR Y-9C) filed with the Federal Reserve System during 1997–2004. All companies that report data for item BHCKA507 on Schedule HC-IC – Additional Detail on Capital Components are retained in the sample.

Table 1 provides descriptive statistics for the sample firms. The number of companies issuing TPS increases monotonically from 1997 through 2002 and then declines in 2003 and 2004. There are very few redemptions of TPS until 2004 when the number increases by nearly a factor of 10. Given the typical 5 year call protection on TPS, a small increase in redemptions through time would be expected, but, all else equal, the increase in redemptions should be proportionate to the increase in issuances outstanding for 5 years. The increase in redemptions in 2004 appears to be disproportionate. The average asset size of sample companies stays fairly flat over the period examined. The fraction of sample companies that are publicly traded fell throughout the period from nearly 38% at the beginning of the sample period to less than 23% by the end of the period. The fraction of liabilities that are funded by debt also rose throughout the period starting at less than 4% in 1997 and ending at 6.5% in 2004. The average capital ratio increases somewhat during the 2002–2004 period relative to 1997–2001. Consistent with this average increase, the fraction of banks with a low capital ratio decreases in the latter years. The ratio of tax expense to pre-tax income declines throughout the sample period. The fraction of assets held in loans, although somewhat lower in 1997 and 1998, is fairly consistent across the sample period.

## Results

### Univariate analysis

Panel A of Table 2 provides the results of tests of differences between the mean values of financial reporting variables for sample companies that issue TPS versus those that do not for the period prior to and subsequent to the accounting change for TPS. Companies that issue TPS are more likely to be publicly traded in the period before the accounting change but not in the post accounting change period. Companies that issue TPS also have a higher fraction of liabilities funded by debt in the pre-accounting change period but not in the period after the accounting changes. For both of these variables the differences in the period when TPS can be classified as equity is consistent with the accounting treatment being important in the decision to issue TPS.

Panel B of Table 2 reports the results of the tests of pre and post accounting change differences between TPS issuing and non-issuing companies for the regulatory capital variables. In both periods the companies that issue TPS have lower regulatory capital ratios and are more like to have regulatory capital ratios that fall below the median than are companies that do not issue TPS. These results are consistent with companies issuing TPS to increase regulatory capital during both reporting regimes.

Panel C of Table 2 reports the pre and post accounting change differences in the ratio of tax expense to pre-tax income. While there is no significant difference in the pre period, in the post period firms that issue TPS have higher tax expenses than those that do not.

Panel D of Table 2 reports the differences for the control variables. The fraction of assets held in loans is consistently higher for TPS issuing companies in both reporting periods while the size of companies issuing TPS is significantly higher in the pre but not in the post reporting period.

Correlations between the financial reporting, regulatory capital and control variables are reported in Table 3. Publicly traded companies are larger, have a higher fraction of debt included in total liabilities, have higher tax expenses, and hold a higher fraction of assets in loans. In addition to the correlation with trading status, size is positively related to the fraction of debt in total liabilities and to tax expenses, and is negatively correlated with the amount of regulatory capital and the fraction of assets held in loans.

### **Logistic regression**

The results of the logistic regression of the determinants of the decision to issue TPS are reported in Table 4. The negative coefficient on the Post variable indicates that the number of companies issuing TPS declined significantly in the period after the change in accounting for TPS. This suggests that even after controlling for the financial reporting, regulatory capital and other control variables companies were less likely to issue TPS when the accounting rules required companies to report the securities as debt.

The coefficients on the financial reporting variables are also consistent with companies responding to the change in the accounting for TPS. The positive coefficient on the Public variable reflects a higher rate of TPS issuance by companies with publicly traded equity during the period that TPS could be classified as equity. The negative coefficient on the Public variable when interacted with the Post variable indicates that this difference in the propensity to issue TPS between publicly traded versus privately held companies is reduced (and virtually eliminated) after the accounting change. The positive coefficient on the Debt variable indicates that firms with greater external debt financing were more likely to issue TPS when those securities could be reported as equity. The negative coefficient on the Debt variable interacted with the post variable indicates that this is no longer the case once the TPS must be reported as debt. Taken together the results from these variables suggest that the financial reporting treatment of TPS was important in the decision to issue these securities.

The coefficients on the regulatory capital variables indicate that the decision to issue TPS was influenced by their affect on regulatory capital in both the period before and after the accounting change. The insignificance on the regulatory capital variables when they are interacted with the Post variables indicates that there was no significant change in the importance of regulatory capital in the decision to issue TPS after the accounting change. These results are consistent with the inclusion of TPS in tier 1 capital both before and after the accounting changes.

The coefficient on the tax variable is marginally significant indicating that firms with higher tax expense were more likely to issue TPS. The importance of taxes appears to increase in the Post accounting change period.

The logit model correctly classifies 84.4 percent of the observations compared to a naïve classification rate of 67.6 percent, and the pseudo r-squared of the model is 27.5 percent.

### **Sensitivity analyses**

I conducted a number of sensitivity tests to ensure that the reported results were not affected by the assumption made in their estimation.

1. In both the univariate and multivariate analyses reported in tables 2 and 4 one observation per bank was randomly selected to reduce potential dependence in the data. The results of both analyses are very similar if all observations are included.
2. The logit regression reported in table 4 includes both a continuous and a dichotomous variable measuring the regulatory capital motive for issuing TPS. Including either of these variables separately produces similar results.

3. Allowing the coefficients on the size and loans variables to differ in the post period produces insignificant coefficients on the interacted variables and does not alter the inferences on the other variables included in the logit model.

### **Supplemental analysis**

For banks that had outstanding trust preferred securities the change in accounting treatment might create an incentive to redeem the securities. However, this possibility is only available after the call protection on the TPS has expired. Ideally, I would like to compare the banks that redeemed their TPS to those that could have redeemed their TPS but chose not to. Unfortunately, I do not have data on the TPS call dates. As an alternate supplemental analysis I compare the characteristics of the banks that issue TPS versus those that redeemed the securities during the post accounting change period. Table 5 reports univariate comparisons of the differences in means for financial characteristics for these two samples. Because the number of redemptions was very low in the period prior to the accounting change these comparisons are made only in the post accounting change period. Banks that redeemed their trust preferred were less likely to be publicly traded and used external debt financing to a greater degree than the banks that did not redeem their trust preferred. These differences are consistent with the elimination of the financial reporting benefits of TPS by the accounting change.

Redeeming banks also had lower capital and paid lower taxes. These differences suggest that banks with lower regulatory and tax benefits were more likely to redeem their TPS during the post period.

The results for the multivariate comparison of banks that issue TPS versus those that redeem TPS are provided in Table 6. The results, which are similar to those in the univariate comparisons, suggest that financial reporting issues were important in the decision to issue versus redeem these securities. Specifically, publicly traded companies with more external debt were less likely to issue TPS and more likely to redeem TPS after the financial reporting benefits were eliminated. The regulatory capital and tax benefits that remained in the post accounting change period resulted in banks with low capital and higher tax expense being more likely to issue and less likely to redeem TPS.

This logit model correctly classifies 69.5 percent of the observations compared to a naïve classification rate of 61.2 percent, and the pseudo r-squared of the model is 8.4 percent. Although the tests reported in Table 6 are not as powerful as those reported in Table 4, similar conclusions can be drawn from the two analyses.

### **Concluding remarks**

Although it is commonly assumed that changes in accounting standards lead to changes in firms' economic behaviour, there is relatively little evidence that this is the case. Typically studies that have examined this issue have focused on settings where the reported numbers were used directly in regulatory or contractual arrangements. Specifically, there is an extensive literature that has examined changes in economic behaviour due to changes in tax accounting and a more limited literature that has examined changes in economic behaviour associated with accounting changes that affect regulatory capital ratios or compliance with debt covenants. Papers that examine whether accounting changes lead to changes in economic behaviour in the absence of explicit arrangements using reported numbers have been relatively rare and the results have been mixed.

In this paper I examine whether banks altered their economic behaviour in response to an accounting change that did not affect regulatory capital ratio calculations. Specifically, I examine changes in accounting that required Trust Preferred Securities to be reclassified

from the equity to the liabilities section of the balance sheet. I find evidence consistent with an overall decline in the use of TPS after the accounting changes. Furthermore, I find that publicly traded banks were more likely to issue TPS prior to the accounting change but not after and that the extent to which the bank had uninsured liabilities was important in the TPS issuance decision prior to the accounting change but not after. Taken together these results suggest that banks may change their economic behaviour in response to accounting changes even in the absence of a regulatory capital effect.

The issue of whether accounting standard setters should consider resulting changes in economic behaviour when writing accounting standards is controversial. The views of Sandy Burton that the impact on behaviour cannot be ignored when establishing accounting standards is not shared by all standard setters. For example, Leisenring (1990), former vice-chair of the Financial Accounting Standards Board states that

*“Unfortunately, it is once again fashionable to suggest that the FASB should abandon the notion that decision-useful information must be neutral and should consider the ‘economic consequences’ of its decisions. Some would even assert that the FASB should try to determine in advance who will be relatively helped or hurt by the result of applying a particular accounting standard, and consider ‘public policy implications’ when it establishes accounting standards. In a word, bias the information reported to influence the capital allocation or other economic decisions toward some predetermined objective, thereby undermining the proper functioning of the capital markets and impairing investors’ and creditors’ capital allocation decisions.”*

Regardless of this controversy, it seems like standard setters should be interested in how economic behaviour changes as a result of their standards even if the standards do not take these changes of behaviour into account.

The results of this paper should also be of interest to bank regulators when considering the likely affect of market discipline on the supervision of banks. The change in bank behaviour associated with the changes in accounting for TPS suggests that the banks were concerned that the market’s interpretation of their risk would be influenced by the classification of these securities on their balance sheets. Given that the change in the accounting standards did not affect the economics of the transaction this suggests that banks believe that the market may not be able to appropriately assess the underlying risks of the transaction, which is critical for effective market discipline.

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## Tables

Table 1

**Descriptive statistics for sample of bank holding companies for 1997–2004.**

Variable/Year	1997	1998	1999	2000	2001	2002	2003	2004
# Firms issuing TPS	39	40	45	76	151	258	197	107
# Firms redeeming TPS	na	4	4	7	12	8	19	169
# Firms with no TPS	1,245	1,292	1,377	1,412	1,125	1,300	1,309	1,475
Mean assets (000,000)	1,159	998	1,302	953	1,123	1,032	1,007	881
Fraction public	0.377	0.383	0.366	0.343	0.303	0.310	0.279	0.228
Debt	0.039	0.044	0.061	0.061	0.057	0.061	0.061	0.065
Capital	0.092	0.092	0.092	0.092	0.092	0.095	0.097	0.097
Low capital	0.339	0.345	0.370	0.375	0.372	0.343	0.294	0.265
Tax	0.471	0.335	0.317	0.301	0.283	0.291	0.273	0.258
Loans	0.619	0.612	0.638	0.652	0.643	0.635	0.629	0.658

### Variable definition

Public: dichotomous variable equal to one if the company files with the SEC (RSSD9056=1) and equal to zero otherwise.

Debt: the sum of commercial paper, subordinated notes and debt, and other short-term and long-term borrowed money divided by total liabilities ((BHCK2309+BHCK4062+BHCK2332+BHCK2333)/(BHCK2170-BHCK3210)).

Capital: the leverage ratio (BHCK8274)/(BHCKA224).

Lowcap: dichotomous variable equal to one if Capital is less than the sample median value (8.6%) and equal to zero otherwise.

Tax: the ratio of tax expense to pretax income (BHCK4302/ (BHCK4302 + BHCK4340)).

Loans: total loans divided by total assets (BHCK2122/BHCK2170).

Table 2

Panel – variable type	Variable	Period	Issue	No-TPS	Difference	t-statistic	
A – Financial Reporting	Public	– Pre	0.423	0.338	0.085	4.20	
		– Post	0.234	0.227	0.007	0.16	
	Debt	– Pre	0.077	0.051	0.026	9.29	
		– Post	0.064	0.062	0.002	0.38	
	B – Regulatory Capital	Capital	– Pre	0.079	0.094	-0.016	-9.01
			– Post	0.082	0.097	-0.016	-7.76
Lowcap		– Pre	0.730	0.450	0.280	13.09	
		– Post	0.645	0.399	0.246	7.67	
C – Tax		Tax	– Pre	0.318	0.321	-0.003	-0.32
			– Post	0.311	0.254	0.058	3.68
D – Control	Loans	– Pre	0.684	0.630	0.055	10.33	
		– Post	0.702	0.640	0.062	4.42	
	Size	– Pre	13.111	12.787	0.324	6.61	
		– Post	12.837	12.739	0.099	0.82	

Pre and post TPS accounting change differences and t-statistic of differences between mean values of sample of bank holding companies characteristics for companies with and without trust preferred stock for a sample of 796 TPS issuances and 1314 non-issuances in the pre period and 107 issuances and 1475 non-issuances in the post period

### Variable definitions

All variables other than the issue variable are calculated as of the beginning of the period to ensure that the measurement of the variables is not affected by the TPS issuance:

Issue: a dichotomous variable equal to 1 if TPS (BHCKA507) are reported in the current year and not in the previous year and equal to zero if TPS equals zero.

Post: dichotomous variable equal to 1 if the observation is from 2004 and equal to zero otherwise.

Public: dichotomous variable equal to one if the company files with the SEC (RSSD9056=1) and equal to zero otherwise.

- Debt: the sum of commercial paper, subordinated notes and debt, and other short-term and long-term borrowed money divided by total liabilities  $((\text{BHCK2309} + \text{BHCK4062} + \text{BHCK2332} + \text{BHCK2333}) / (\text{BHCK2170} - \text{BHCK3210}))$ .
- Capital: the leverage ratio  $(\text{BHCK8274}) / (\text{BHCKA224})$ .
- Lowcap: dichotomous variable equal to one if Capital is less than the sample median value (8.6%) and equal to zero otherwise.
- Tax: the ratio of tax expense to pretax income  $(\text{BHCK4302} / (\text{BHCK4302} + \text{BHCK4340}))$ .
- Loans: total loans divided by total assets  $(\text{BHCK2122} / \text{BHCK2170})$ .
- Size: log of total assets  $(\text{BHCK2170})$ .

Table 3

**Correlations between bank holding company characteristics**

	Public	Debt	Capital	Lowcap	Tax	Loans	Size
Public	1.000						
Debt	0.160	1.000					
Capital	-0.015	-0.130	1.000				
Lowcap	-0.012	0.119	-0.713	1.000			
Tax	0.142	0.037	-0.017	0.012	1.000		
Loans	0.049	0.093	-0.220	0.128	0.128	1.000	
Size	0.364	0.223	-0.084	0.094	0.128	-0.077	1.000

**Variable definitions**

All variables other than the issue variable are calculated as of the beginning of the period to ensure that the measurement of the variables is not affected by the TPS issuance:

Public: dichotomous variable equal to one if the company files with the SEC (RSSD9056=1) and equal to zero otherwise.

Debt: the sum of commercial paper, subordinated notes and debt, and other short-term and long-term borrowed money divided by total liabilities  $((\text{BHCK2309} + \text{BHCK4062} + \text{BHCK2332} + \text{BHCK2333}) / (\text{BHCK2170} - \text{BHCK3210}))$ .

Capital: the leverage ratio  $(\text{BHCK8274}) / (\text{BHCKA224})$ .

Lowcap: dichotomous variable equal to one if Capital is less than the sample median value (8.6%) and equal to zero otherwise.

Tax: the ratio of tax expense to pretax income  $(\text{BHCK4302} / (\text{BHCK4302} + \text{BHCK4340}))$ .

Loans: total loans divided by total assets  $(\text{BHCK2122} / \text{BHCK2170})$ .

Size: log of total assets  $(\text{BHCK2170})$ .

Table 4

Variable	Predicted Sign	Coefficient	t-statistic
Intercept	+/-	-4.289	-5.17
Post	-	-2.423	-2.36
Public	+	0.366	3.21
Public*post	-	-0.608	-2.25
Debt	+	2.823	3.41
Debt*post	-	-4.947	-2.55
Capital	-	-20.482	-5.63
Capital*post	+/-	-4.695	-0.51
Lowcap	+	0.369	2.29
Lowcap*post	+/-	-0.201	-0.56
Tax	+	0.525	1.65
Tax*post	+/-	1.303	1.85
Loans	+/-	2.840	7.08
Size	+/-	0.291	5.99
NoPool	-	-1.623	-12.65
Correctly predicted		84.4%	
Pseudo R-square		27.5%	

Coefficients and t-statistics from a logistic regression of the decision to issue TPS in the pre versus post TPS accounting change period for a sample of 903 TPS issuances and 2,789 non-issuances.

## Variable definitions

All variables other than the issue variable are calculated as of the beginning of the period to ensure that the measurement of the variables is not affected by the TPS issuance:

Issue: a dichotomous variable equal to 1 if TPS (BHCKA507) are reported in the current year and not in the previous year and equal to zero if TPS equals zero.

Post: dichotomous variable equal to 1 if the observation is from 2004 and equal to zero otherwise.

Public: dichotomous variable equal to one if the company files with the SEC (RSSD9056=1) and equal to zero otherwise.

Debt: the sum of commercial paper, subordinated notes and debt, and other short-term and long-term borrowed money divided by total liabilities ((BHCK2309+BHCK4062+BHCK2332+BHCK2333)/(BHCK2170-BHCK3210)).

Capital: the leverage ratio (BHCK8274)/(BHCKA224).

- Lowcap: dichotomous variable equal to one if Capital is less than the sample median value (8.6%) and equal to zero otherwise.
- Tax: the ratio of tax expense to pretax income ( $BHCK4302 / (BHCK4302 + BHCK4340)$ ).
- Loans: total loans divided by total assets ( $BHCK2122 / BHCK2170$ ).
- Size: log of total assets ( $BHCK2170$ ).
- NoPool: a dichotomous variable equal to 1 for years prior to 2000, which is the year of the first Trust Preferred Pool offering.

Table 5

Category	Variable	Period	Issue TPS	Redeem TPS	Difference	t-statistic
A – Accounting	Public	– Post	0.234	0.385	-0.151	2.51
	Debt	– Post	0.064	0.082	-0.006	-2.26
B – Regulatory Capital	Capital	– Post	0.082	0.085	-0.003	-1.40
	Lowcap	– Post	0.645	0.539	0.106	1.76
C – Tax	Tax	– Post	0.312	0.254	0.057	2.80
D – Control	Loans	– Post	0.702	0.693	0.009	0.61
	Size	– Post	12.837	13.222	-0.385	-2.66

Post TPS accounting change differences and t-statistic of differences between mean values of sample of bank holding companies characteristics for 107 companies issuing versus 169 companies redeeming trust preferred stock.

### Variable definitions

All variables other than the issue variable are calculated as of the beginning of the period to ensure that the measurement of the variables is not affected by the TPS issuance:

Post: dichotomous variable equal to 1 if the observation is from 2004 and equal to zero otherwise.

Public: dichotomous variable equal to one if the company files with the SEC (RSSD9056=1) and equal to zero otherwise.

Debt: the sum of commercial paper, subordinated notes and debt, and other short-term and long-term borrowed money divided by total liabilities  $((bhck2309+bhck4062+bhck2332+bhck2333)/(bhck2170-bhck3210))$ .

Capital: the leverage ratio  $(BHCK8274)/(BHCKA224)$ .

Lowcap: dichotomous variable equal to one if Capital is less than the sample median value (8.6%) and equal to zero otherwise.

Tax: the ratio of tax expense to pretax income  $(BHCK4302/ (BHCK4302 + BHCK4340))$ .

Loans: total loans divided by total assets  $(BHCK2122/BHCK2170)$ .

Size: log of total assets  $(BHCK2170)$ .

Table 6

Variable	Predicted Sign	Coefficient	t-statistic
Intercept	+/-	2.267	1.00
Public	-	-0.557	-1.74
Debt	-	-4.167	-1.82
Lowcap	+	0.624	2.25
Tax	+	3.053	3.61
Loans	+/-	-0.348	-0.28
Size	+/-	-0.292	-2.01
Correctly predicted		69.5%	
Pseudo R-square		8.4%	

Coefficients and t-statistics from a logistic regression of the decision by 107 companies to issue TPS versus the decision by 169 companies to redeem TPS in the post accounting change period

### Variable definitions

All variables other than the issue variable are calculated as of the beginning of the period to ensure that the measurement of the variables is not affected by the TPS issuance:

Redeem: a dichotomous variable equal to 1 if TPS (BHCKA507) are zero in the current year and greater than zero in the previous year.

Public: dichotomous variable equal to one if the company files with the SEC (RSSD9056=1) and equal to zero otherwise.

Debt: the sum of commercial paper, subordinated notes and debt, and other short-term and long-term borrowed money divided by total liabilities ((BHCK2309+BHCK4062+BHCK2332+BHCK2333)/(BHCK2170-BHCK3210)).

Capital: the leverage ratio (BHCK8274)/(BHCKA224).

Lowcap: dichotomous variable equal to one if Capital is less than the sample median value (8.6%) and equal to zero otherwise.

Tax: the ratio of tax expense to pretax income (BHCK4302/ (BHCK4302 + BHCK4340)).

Loans: total loans divided by total assets (BHCK2122/BHCK2170).

Size: log of total assets (BHCK2170).