



# The effect of leverage and liquidity on earnings and capital management: Evidence from U.S. commercial banks



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## ABSTRACT

Prior research shows that firms can manage earnings aggressively through making accounting choices affecting discretionary current accruals surrounding equity offerings as a means of smoothing earnings over time. Some evidence indicates that aggressive earnings management carries over to aggressive management of capital structure in the form of higher leverage and aggressive management of working capital in the form of lower liquidity. Earnings management by banks is achieved instead by managing accruals dealing with payment behavior on loans: the loan loss provision and net charge-offs. A regulatory change expressed in the Basel III accords has tightened requirements on leverage and liquidity and could have affected earnings and capital management.

This study examines the effect of leverage and liquidity on the behavior of earnings and capital management in U.S. commercial banks over the period from 1999 to 2013. If aggressive earnings management behavior carries over to aggressive leverage and liquidity policies, we should expect a negative relation between earnings management measures and capital measures and a negative relation between earnings management and liquidity measures. We show that earnings and capital management measures consistently have a significant positive relationship with capital ratios and a significant negative relationship with liquidity ratios. These results suggest that regulators should be on guard for all forms of aggressive management behavior. In the post-crisis period, our results also show evidence of additional regulatory scrutiny with a significant positive relation between liquidity and earnings management, which could indicate that less liquid banks are prevented from engaging in earnings management by regulators.

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## 1. Introduction

Considerable evidence shows that managers engage in opportunistic earnings management practices in order to smooth earnings over time or to show higher earnings prior to an equity financing event (Teoh, Welch, & Wong, 1998a, 1998b; Rangan, 1998). Gao and Shreves (2002); Cohen, Dey, and Lys (2004); Cheng and Warfield (2005), and Bergstresser and Philippon (2006) all find that the use of discretionary accruals and earnings management is more common at firms where top management compensation is more closely tied to the value of stock and particularly when tied to options. When earnings management is particularly aggressive, managers and the company can be subject to civil or even criminal fraud charges (Karpoff, Lee, and Martin, 2008a, 2008b, 2007). Aggressive earnings management behavior could be linked to other aggressive management practices in managing the firm's working capital or its financial structure.

Non-financial firms can manage earnings through management of accruals or by management of real operations. Accruals management involves accounting choices in the timing of recognition of revenues and expenses and can be measured by some

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variation of the discretionary current accruals measure employed by Jones (1991) in a study of earnings-reducing accruals by companies lobbying in favor of tariff restrictions on foreign imports. Companies could also manage earnings through timing of real activities such as research and development in an effort to produce the desired earnings level.

Aggressive earnings management could be related to aggressive management practices in other firm policies, including financial leverage and working capital management. An aggressive leverage policy would be indicated by a high degree of financial leverage and an aggressive working capital policy would be indicated by a low level of liquid assets. In this case a positive relation between leverage and earnings management would be observed and a negative relation between liquidity and earnings management measures would be observed.

Bank managers share some of the same incentives for earnings management as non-financial companies with some of the same needs to generate consistently growing earnings that consistently meet or beat analyst estimates. The regulatory process under which banks operate places additional constraints and incentives for earnings management. The financial crisis and the central involvement of banks in that crisis have changed the regulatory environment in which they operate and could have changed some of the regulatory incentives and constraints.

Instead of managing earnings through discretionary accruals, banks can manage earnings through estimation of loan losses or by the timing of loan charge-offs. The two accrual items for banks include the loan loss provision (LLP) and the net charge-off (NCO). The loan loss provision is an estimate of future losses that will be suffered on outstanding loans. The loan loss provision is a relatively large accrual for commercial banks and, therefore, has a significant impact on banks' earnings and regulatory capital. In principle, the purpose of the loan loss provision is to adjust banks' loan loss reserves to reflect expected future losses on their loan portfolios (Ahmed et al., 1999). Net charge-offs is the result of considering a loan to be uncollectible. Considerable accounting and managerial discretion is available in the estimation of either of these accrual items for banks.

Several related studies that analyze the loan loss provision and net charge-off for U.S. banks prior to the 1989 regulatory change in bank capital ratio determination highlight that banks might have used discretionary net charge-offs for capital management (Moyer, 1990; Beatty et al., 1995; Collins et al., 1995; Kim and Kross, 1998). Net charge-off is deducted from loan loss reserve (loan loss reserve = lagged loan loss reserve + loan loss provision – loan charge-off). Therefore, banks were able to decrease their net charge-off in order to increase their regulatory capital. High loan loss reserves improve the banks' ability to absorb losses without becoming financially distressed or failing. However, the direct consequence of an increase in a bank's loan loss reserve is merely increasing the reserve and reducing reported net income. The reduction in net income has the direct effect of reducing a bank's retained earnings and owners' equity. On the other hand, the loan loss provision and capital requirements are linked through the coverage of credit risk.

Banks need to set a loan loss provision to face expected losses in their credit portfolio, whereas bank capital has to cover the unexpected component of loan losses (Abou El Sood, 2012). Bikker and Metzmakers (2005) indicate that there is a general agreement that unexpected losses should be covered by bank capital, whereas expected losses should be covered by loan loss provisions or by future margin income. The so-called "statistical provision" forces banks to set aside provisions for the expected losses that are embedded in their expanding credit portfolios during good times, and allows banks to use the reserve to cover realized losses during bad times (Wall and Koch, 2000). The banks should be concerned whether the loan loss provision can cover expected loan losses, and the influence of earnings' change in financial statements. Hasan (2006) presents the hypothesis that capital management can be implemented via the loan loss provision. This hypothesis is based on the concept that bank managers use the loan loss provision to avoid the costs associated with the violation of capital adequacy requirements.

The Basel Committee on Banking Supervision in their Basel III accords raised banks' required capital reserves at the end of 2010 and further strengthened capital requirements by increasing banks' capital requirements and liquidity in 2013. In addition, the Basel Committee enacted the countercyclical capital buffer requirement to mitigate the effects of procyclical capital buffer allowing banks to become vulnerable in the 2008 financial turmoil. According to Basel III, banks must adopt new technology or upgrade internal systems to manage liquidity risk, and reduce their financial leverage, both of which will restrict operational flexibility and affect earnings. Specifically, tangible common equity, Tier 1 capital and total capital must be at least 7%, 8.5% and 10.5% of risk weighted assets, respectively, by 2018. Two liquidity ratios, liquidity coverage and net stable funding were introduced to ensure the short-term and medium-term liquidity of the banking sector. These regulatory changes could change leverage and liquidity policies by banks. Furthermore, a poorly capitalized bank is subject to increased oversight by federal regulators, which suggests that the opportunity for earnings management is minimized. In contrast, a better capitalized bank experiences less scrutiny by regulators and can more easily manage earnings.

Our study employs data from 124 active U.S. commercial banks with 1890 observations during the period from 1999 to 2013. By incorporating a sample period within the financial crisis of 2008–2009, we can examine whether earnings management is observed during the crisis period, which could lead regulators to take action to reduce or eliminate the practice of inflating capital or managing earnings in a crisis period.

Section 2 discusses relevant prior literature. Section 3 develops testable hypotheses. Section 4 discusses the research methodology and variables used in the study. Section 5 explains the data and sample selection. Section 6 presents the results of the research and the final section presents the conclusions.

## 2. Literature review

### 2.1. Capital management (CM)

Prior to 1989, banks were required to hold primary capital (defined as Tier 1 capital to include book value of equity, loan loss reserve, perpetual preferred stock and mandatory convertible debt) exceeding 5.5% of total assets and total capital (total capital

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