

A Faculty and Undergraduate Student Collaboration: Are Banks' Changes in Held-to-Maturity Securities Related to Incoming Capital Requirements?

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This research paper represents the culmination of a joint faculty and undergraduate student collaboration that addresses comments in the financial press asserting banks are categorizing a greater percentage of their debt investments as held-to-maturity (HTM) rather than available-for-sale (AFS) in preparation of the Basel III Accord regulations. If a decline in the market values of AFS securities is anticipated, then banks will be more inclined to categorize their debt investments as HTM to avoid decreases to their capital ratios. An alternative explanation is that banks are increasing their liquidity in response to the tightening of monetary policy. Results support the alternative explanation.

INTRODUCTION

Recent incoming changes to the Basel III Accord increases the capital requirements of banks' tangible common equity, Tier 1 capital, and total capital to a minimum of 7.0%, 8.5%, and 10.5% of risk-adjusted assets, respectively by 2018 (Gombola et al. 2016). Articles in the financial press assert that one reaction by the banks for this incoming change is to categorize a greater percentage of their debt investments as held-to-maturity (HTM) rather than available-for-sale (AFS) (Rapoport 2015; Shenn 2014). The reason cited for this change in categorization is due to the differences in accounting for HTM and AFS securities under generally accepted accounting principles (GAAP). On the one hand, HTM securities are recorded at amortized cost which means changes in the market value are not reflected in earnings and do not affect the asset's cost base. On the other hand, AFS securities are adjusted to market value each reporting period with changes in the assets' values recorded in other comprehensive income, a component of stockholders' equity. Thus, under the AFS category changes in the debt investments' market values directly impact the banks' capital and its capital ratios for regulatory purposes. If greater volatility in the market prices of debt investments is anticipated, then banks will be more inclined to categorize their debt investments as HTM to avoid potential decreases to their capital ratios. Further, downward pressure on the market prices of debt investments occurs when interest rates are expected to rise because new debt issues will offer higher interest rates and the existing debt investments will appear unattractive. During 2014 and 2015, the Federal Reserve hinted at increasing interest rates (Janosky 2014; Yellen 2015).

Banks have been inclined in the past to react to changes in conditions, both economic or in the regulatory environment, by adjusting their accounting methods. Prior academic research has investigated banks' reaction to these changes. Kim and Kross (1998) investigate banks' use of accounting accruals to manage their capital ratios when regulatory changes to the calculation of capital ratios occurred in 1989. Their findings show differences in accounting for loan loss provisions and write-offs between the periods prior to the change (1985 to 1988 period) and after the change (1990 to 1992 period) for banks with low capital ratios. Further, Gombola et al. (2016) find banks earnings management behavior is significantly positively related to liquidity during the post-financial crisis period. The authors' study covers the pre- and post-financial crisis periods (1999 to 2013), periods of increasing capital regulatory requirements (e.g. Basel III Accord).

The purpose of this study is to investigate whether or not the banks are responding to changes in the capital regulatory environment by increasing their holdings of HTM securities as suggested by the financial press. If the reason suggested cannot be substantiated, then another reason will be provided to explain the banks' behavior of increasing the percentage of debt investments recorded on their books as HTM.

Results indicate that the banks are well-capitalized and are not acting in the manner suggested by the financial press. Rather, banks are liquidating AFS securities to increase their liquidity. By increasing their liquidity, the banks will be well-positioned for the anticipated decrease in customers' deposits. Customers' deposits will decline because the cash withdrawals would be used by depositors to reduce their debts that will become more expensive with the increase in interest rates due to the increase in the Federal Funds rate. Overall, the results provide evidence of an alternative explanation for the increased proportion of banks' debt investments held in the HTM category.

The results of this research study adds to the stream of literature pertaining to banks' dealing with changes in the economic or regulatory environment by making accounting choices. Regulators, accounting academics, and auditors will find the results of this study useful in their work. Regulators can consider these results when setting new policy. Accounting academics can use these results as a springboard for further investigation. Auditors can consider these results in the context of their risk assessments during the audit planning stage.

The research paper is organized as follows:

1. Background information and literature review;
2. Research design;
3. Results; and
4. Conclusion.

BACKGROUND INFORMATION AND LITERATURE REVIEW

Recent articles in the financial press provide commentary on the banks' reaction to the more stringent Basel III Accord's capital ratio requirements. Shenn (2014) states, "the largest U.S. lenders are moving assets into the 'held-to-maturity' columns of their books." The reason for this shift of debt investments to the HTM category is explained by Shenn (2014) as follows:

In July, agencies including the Fed and FDIC, in implementing parts of the Basel III accord negotiated by international regulators, included a change requiring gains and losses on AFS holdings to be included in capital, a switch being phased in through 2018.

Coupled with the anticipated increases in the Federal Funds rate, banks' capital would be more susceptible to decline as the market value of AFS securities declines with increases in interest rates. Banks can avoid this "hit" to their capital by increasing the proportion of debt investments held in the HTM category. Under GAAP, HTM securities are not adjusted to market value each financial reporting period, but are recorded at amortized cost. The implication is that declines in the market value of a debt

investment are booked against a bank's capital with the AFS classification, but not under the HTM classification.

Rapoport (2015) reaches a similar conclusion in a Wall Street Journal article. Rapoport (2015) states:

The big shift in securities portfolios shows banks increasingly striving to keep their financial ratios strong in a new rising-interest rate environment, while also being responsive to any new regulations.

Increases in interest rates are expected because of the comments by Janet Yellen, Chair of the Federal Reserve. Janosky (2014) states, "Newly installed Fed Chair Janet Yellen told the market to expect an increase in the federal funds rate near mid-2015, and each institution needs to have a plan suited to their specific needs that accounts for this scenario." Further Yellen (2015) states, "Based on my outlook, I expect that it will be appropriate at some point later this year to take the first step to raise the federal funds rate and thus begin normalizing monetary policy." Thus, the more stringent capital requirements stipulated by Basel III coupled with the expectation of higher interest rates, lead to the logical conclusion drawn by the financial press that the higher proportion of HTM securities are the banks' response to these changes in circumstances.

The accounting academic research is rich in investigating banks' accounting choices. Kim and Kross (1998) investigate banks' use of accounting accruals to manage their capital ratios. In 1989, bank regulators including the Office of the Comptroller of the Currency (OCC), Federal Deposit Insurance Corporation (FDIC), and the Board of the Governors of the Federal Reserve System (FRB), changed the determination and the minimum level of banks' capital ratios. Prior to 1989, increases in a bank's "loan loss provision" account increased the bank's regulatory capital, whereas after 1989, an increase in the loan loss provision account decreased the bank's regulatory capital. Thus, banks have an incentive to reduce their loan loss provisions after 1989. Kim and Kross (1998) find this result, especially for banks with "low capital ratios." The authors use a threshold of 2½% above the minimum primary total capital ratio as a method of defining a bank with a low capital ratio.

Banks can suffer adverse consequences if they do not meet the minimum regulatory capital requirements. Wall and Koch (2000) state banks with insufficient capital are considered "undercapitalized" and are under greater scrutiny by bank regulators (e.g. FDIC). Further, undercapitalized banks may suspend dividend payments to investors and management fees to holding companies. The undercapitalized banks' share prices could decline making it more difficult for these banks to raise capital in the market. Also, even the banks' creditworthy customers may find it more difficult to obtain loans from these banks. Taken together, there are numerous adverse consequences if a bank cannot satisfy the minimum regulatory capital requirements.

The current bank regulatory environment in the U.S. consists of a combination of U.S. and international standards (Wall and Koch 2000). U.S. standards include regulations under the OCC, FDIC, FRB, and the 2010 Dodd-Frank Wall Street Reform and Consumers Protection Act (Dodd-Frank). The primary international regulation falls under the Basel Committee on Banking Supervision, with the most recent important standard consisting of the Basel III Accord. Among other requirements these standards address banks' risk taking by requiring more stringent capital ratios and tightening the definition of banks' capital. Under Basel III, the tightening of banks' capital components results in three definitions of capital — common equity capital, Tier 1 capital, and total capital. By 2018, the minimum threshold for each category of capital is 7%, 8.5%, and 10.5% of risk weighted assets respectively (Gombola et al. 2016). Given the consequences of failing to meet the regulatory requirements, banks are inclined to move in the direction of satisfying the Basel III requirements.

Meder (2015) discusses the interaction of banks accounting for debt investments and monetary policy. The author states that under the Financial Accounting Standards Board's (FASB) Statement of Financial Accounting Standards No. 115 (SFAS 115) firms' debt investments are classified as trading, AFS, or HTM. The classification is dependent on a firm's intent on how long they intend to hold the security. Securities held for short-term trading gains are classified as trading securities whereas securities

held until their maturity date are classified as HTM. Securities that do not fit into these two categories are considered AFS. A reduction in the market value of a security results in a decrease in net income (trading security) and other comprehensive income (AFS security), respectively. In both cases, declines in the security's market value results in a decrease in stockholders' equity under both the trading and AFS categories. Under the HTM classification, changes in a security's market value do not affect current earnings or stockholders' equity. Generally, firms are not supposed to switch their original classification of a debt investment as trading, AFS, or HTM. However, Meder (2015) notes that exceptions are provided under SFAS 115 to switch classification. One of the reasons identified is an increase in the required capital regulations. Thus, the incoming changes to the Basel III Accord provide banks with an incentive to alter the mix of their holdings of debt investments.

Meder (2015) notes that prior research into implementing monetary policy shows that higher balance sheet liquidity strengthens loan growth and alleviates reductions in lending due to the tightening of monetary policy (Bernanke and Blinder 1992). Meder (2015) states, "Specifically, marketable securities that are classified as HTM become effectively illiquid due to that classification, while non-HTM securities maintain their liquidity." Banks need to increase liquidity in a period of anticipated increases in interest rates. Two explanations are: (1) borrowers may choose to increase their debt level with fixed rate debt prior to further increases in interest rates; and (2) borrowers may reduce their deposits to pay down their debts. In either case, banks need to keep adequate funds on hand to satisfy the demands for cash.

Meder (2015) examines the changes in deposits and marketable securities during monetary tightening and non-tightening periods. The author finds transactional deposits and non-HTM securities significantly decrease during tightening periods. Meder (2015) concludes, "These results are consistent with banks facing a decline in transactional deposits that are partially replaced by liquidating salable (non-HTM) securities." Overall, Meder (2015) provides an alternative explanation why banks shift the mix of their debt investments, resulting in a higher percentage of HTM securities on the balance sheet.

Gombola et al. (2016) examine the effect of leverage and liquidity on earnings and capital management for U.S. commercial banks. Their study covers the period from 1999 to 2013. Gombola et al. (2016) define leverage by the three capital ratios (Tier 1 capital, total capital, and tangible common equity) resulting in the independent variables Lev 1, Lev 2, and Lev 3, respectively. Liquidity is defined two ways — Liq 1 (liquid assets / deposits) and Liq 2 (liquid assets / total assets). The authors hypothesize that bank leverage is negatively associated with earnings and capital management. That is, banks with low leverage (weak capital ratio) are more likely to manage earnings and capital. Further, the authors hypothesize that liquidity is negatively associated with earnings and capital management. Finally, the authors hypothesize that banks' earnings management behavior differs between the pre-financial crisis (1999 to 2006) and post-financial crisis (2009 to 2013) periods. The authors use the loan loss provision, net charge off, and abnormal loss provision as the measures for earnings and capital management. Their findings are divided into pre- and post-financial crisis periods. The post-financial crisis results are pertinent to this study and are discussed next. Gombola et al. (2016) find earnings management and liquidity are significantly positively associated. Further, the authors find that the earnings management measures are significantly negatively associated with leverage during the *pre*-financial crisis period, but not during the *post*-financial crisis period, except for Lev 3 which is significantly positively associated during the post-financial crisis period. These results conflict with the authors' first two hypotheses, but support their third hypothesis that the post-financial crisis period differs from the pre-crisis period. More importantly, these results indicate a shift in banks' concerns during the post-financial crisis period. That is, banks are less likely to manage their capital ratios during the post-financial crisis period as evidenced by the lack of statistically significant associations between the Lev 1 and 2 and the earnings management variables. An explanation for this behavior is that banks could be well-capitalized during the post-financial crisis period because of the increased regulation and monitoring (e.g. Dodd-Frank) and have no need to manage their capital ratios. Thus, banks position themselves to take advantage of lending opportunities in the current circumstances by focusing on their liquidity.

Overall, there are two logical explanations in the current economic and monetary environment to explain the higher proportion of banks' debt investments classified in the HTM category. On the one

hand, as suggested by the financial press, banks are choosing to categorize debt investments as HTM to reduce the risk of declines in the assets' market values adversely affecting their capital ratios. Under GAAP, declines in assets' market values do not impact a bank's capital with the HTM classification for its debt investments. With the incoming Basel III requirements and expected increases in interest rates, a bank does not want to trigger an investigation by a regulatory authority.

On the other hand, the post-financial crisis period differs from prior periods. Generally, banks are well-capitalized due to increasing regulation during the post-financial crisis period (e.g. Dodd-Frank). During this period, banks are more inclined to respond to changes in monetary policy with the expectation of increasing interest rates. Prior literature shows that banks liquidate AFS securities in this situation to replace customers' deposits and increase their liquidity.

RESEARCH DESIGN

Sample Selection

The sample data consists of thirty of the largest U.S. financial institutions for the years 2014 and 2015 with complete financial data to run the statistical tests required for this study. These firms fall under the SIC codes 6021 (national commercial banks), 6022 (state commercial banks), 6035 (savings institution, federally chartered), and 6141 (personal credit institutions) and were selected because of their significant position in the U.S. economy. The sample is drawn from, "Insured U.S.-Chartered Commercial Banks That Have Consolidated Assets of \$300 Million or More, Ranked by Consolidated Assets," at <https://www.federalreserve.gov/releases/lbr/current/> as at June 30, 2016. Table 1 shows the list of firms and their SIC codes. The firms' financial data is obtained from the firms' 10-K annual reports filed with the Securities and Exchange Commission's (SEC) and is accessed through the "Edgar" data base at <https://www.sec.gov/edgar.shtml>. The two year study period for the thirty firms results in a total of sixty observations.

Hypotheses and Research Models

The hypotheses reflect the sentiment suggested by the financial press that banks are categorizing a greater percentage of their debt investments as HTM rather than AFS. The conjecture is that banks are responding to the increasing capital ratio requirements stipulated by the Basel III Accord and the prospect of increases to the federal funds rate. First, increases in the federal funds rate makes new-issue debt investments offering higher interest rates more attractive when compared to existing debt securities. Existing AFS securities held on the banks' books will decline in value with the related losses reported in comprehensive income and stockholders' equity. Banks' reported capital will decline along with their capital ratios. A federal funds rate increase would not have this effect on banks' HTM holdings because these securities are recorded at amortized cost. Second, banks have shown in the past (e.g., Kim and Kross 1998) that they react to changes in capital ratio requirements. Kim and Kross (1998) find banks with low capital ratios are more likely to respond to the changes. Thus, banks with declining capital ratios have a greater likelihood to increase their HTM holdings. The first research hypothesis is stated as:

H₁: Decreases in banks' total capital ratios are associated with increases in their reported HTM holdings.

Prior research shows banks respond when their reported capital ratios approach the regulatory thresholds or limits (e.g., Kim and Kross 1998). Banks need to function above the regulatory limits, otherwise they run the risk of being investigated by the regulatory agencies (e.g., FDIC). Adverse consequences result from the perception that banks are undercapitalized (Wall and Koch 2000). These consequences include suspension of dividend payments to investors and a reduction of management fees paid to holding companies. Further, share prices could decline making it more difficult for these banks to raise capital in the financial markets. Thus, the second hypothesis is expressed in the following form:

H₂: *Banks are more likely to increase their reported HTM holdings as they approach the well-capitalized capital ratio threshold.*

The regression model used to test this study's hypotheses is as follows:

$$\Delta\text{HTM}_{it} = \beta_0 + \beta_1 (\Delta\text{CAP}_{it}) + \beta_2 (\text{THRESH}_{it}) + \beta_3 (\Delta\text{AFS}_{it}) + \beta_4 (\text{YEAR}_i) + \beta_5 (\text{SIZE}_{it-1}) + \beta_6 (\text{LEVER}_{it-1}) + \varepsilon_{it} \quad (1)$$

where:

$\Delta\text{HTM}_{it} = (\text{HTM}_{it} / \text{Total Debt Investments}_{it}) - (\text{HTM}_{it-1} / \text{Total Debt Investments}_{it-1})$;

$\Delta\text{CAP}_{it} = (\text{CAP}_{it} - \text{CAP}_{it-1})$, that is the change in a bank's total capital ratio;

THRESH_{it} = an indicator variable; 1 if the bank's total capital ratio is within 4% of the well-capitalized bank ratio (i.e., 10%), otherwise = 0;

$\Delta\text{AFS}_{it} = (\text{AFS}_{it} - \text{AFS}_{it-1}) / \text{Total Assets}_{it-1}$;

YEAR_i = an indicator variable; 1 if the bank's data relates to 2014 and 0 if the bank's data relates to 2015; SIZE_{it} = the natural log of the bank's total assets at $t - 1$;

LEVER_{it} = the ratio for the bank's total liabilities to total assets at $t-1$; and

ε_{it} = error term.

This model tests the hypotheses that are put forth in this research study. An explanation follows. The first hypothesis is testing whether decreases in banks' total capital ratios are associated with increases in reported HTM holdings. Banks experiencing declines in their capital ratios would be inclined to increase their share of HTM holdings because of the combination of higher incoming capital ratio standards under the Basel III Accord and the expectation of rising interest rates. Thus, these factors would result in banks shifting the categorization of their debt investments from AFS to HTM. The coefficient of interest is β_1 as it captures the change in a bank's total capital ratio. If a change is negative, then the total capital ratio has declined during the year and banks would be inclined to increase their holdings of HTM. Thus, the relationship between β_1 and the dependent variable is expected to be negative.

Kim and Kross (1998) used thresholds in their research design to categorize "low capital banks." In their study, low capital banks for the 1985 to 1988 period possess an adjusted Tier 1 capital ratio less than or equal to 6.5%. For the 1990 to 1992 period, the regulatory threshold was 8.0% (Kim and Kross 1998, p. 76). Low capital banks during the 1990 to 1992 period are defined as banks operating with a total capital ratio of less than or equal to 10.5%. The cut-off used in their study amounts to 2.5% (i.e., 10.5% - 8.0%). Thus, banks possessing a total capital ratio within 2.5% of the regulatory standard are considered low capital banks.

Since the implementation of Dodd-Frank, banks have improved their capital position. No bank in this study possesses a total capital ratio within 3% of the total capital ratio standard of 8.0% or within 1% of the well-capitalized bank ratio of 10.0%. That is, each bank possesses a total capital ratio of at least 11.0% during the two year study period (i.e. 2014 and 2015). For this study, the threshold chosen is 4% above the well-capitalized bank ratio of 10.0%. The well-capitalized ratio of 10.0% is an appropriate standard for this study because the upcoming total capital standard under the Basel III Accord is 10.5%. Banks operating below the 4% threshold and closer to the 10.0% well-capitalized standard are more likely to reduce the adverse effects of holding AFS securities on their total capital ratio and to increase their holdings of HTM securities. Thus, a positive association is expected between β_2 and the dependent variable.

Meder (2015) finds banks liquidate their non-HTM securities during a period of tightening monetary policy. This means that AFS securities are liquidated to increase banks' available cash because depositors would draw upon the cash to reduce outstanding loan balances. As a result, the percentage of HTM to total debt investments increases because of the liquidation of AFS securities and the author provides an alternative explanation for the increasing percentage of HTM securities to total debt investments. Banks

responding to a tightening of monetary policy indicates β_3 would be negatively associated with the dependent variable.

The variable YEAR indicates whether a particular year (2014 or 2015) is associated with banks' changes in their holdings of HTM securities. A positive relation between β_4 and the dependent variable indicates how far in advance (e.g., 2014 fiscal year) banks react to changes in the regulatory requirements. No prediction is offered for this variable.

SIZE and LEVER represent control variables. Since all the banks included in this study are large U.S. commercial banks, no statistical association between SIZE and the dependent variable is predicted. Future studies incorporating a variety of banks by size (e.g. regional banks) may find differences in the strategy of holding HTM and AFS securities. For LEVER, banks with higher debts would incur higher interest costs in an environment of increasing interest rates. Higher interest costs would increase earnings volatility. These banks may be inclined to increase their HTM holdings and decrease their AFS securities to reduce the exposure to earnings volatility. Thus, the coefficient for LEVER (β_6) is expected to be positive. Overall, the predicted signs for the regression coefficients are provided in Table 2.

RESULTS

Preliminary Analysis

Descriptive statistics are presented in Table 3. Total debt investments is the sum of HTM and AFS securities. On average, banks are increasing their holdings of HTM securities as a percentage of total debt investments as illustrated by the mean of the dependent variable. The mean's increase is 0.5% (mean = 0.0050060). Banks' total capital ratios on average declined over the study period by 0.43% (mean = -0.004297). From the 60 total observations, firms exhibited 37 declines in their total capital ratios (results not shown). On average, banks increased their holdings of AFS securities over the study period (mean = 0.007854). In addition, the mean assets size and debt to asset ratios are \$101, 158.08 million and 88.2%, respectively.

Table 4 presents the Pearson correlations. On the one hand, these results indicate little correlation between the capital ratio related variables (CAP and THRESH) and the dependent variable. The correlations are 0.146 and 0.002 respectively. On the other hand, the AFS related variable is significant and negatively correlated with the dependent variable. The Pearson correlation is -0.599. Overall, the preliminary findings would not suggest support for the two hypotheses, but support the alternative explanation provided by Meder (2015).

Primary Analysis

Table 5 reports the regression results for the primary research model. The coefficient β_1 that is related to changes in the banks' total capital ratios is positive and not significant. The expected sign on the coefficient is negative. Thus, H_1 is unsupported because decreases in banks' total capital ratios are not associated with increases in their reported HTM holdings.

The results for H_2 are also not supported. The coefficient for β_2 is positive but insignificant. There is no statistically significant association between banks' total capital ratios approaching the 10.0% well-capitalized mark and changes in their holdings of HTM securities. Overall, these results do not support the assertions of the financial press that banks are increasing their reported HTM holdings in response to the upcoming Basel III requirements.

The alternative explanation for banks changing their HTM holdings is that banks are responding to anticipated changes in monetary policy. Janosky (2014) and Yellen (2015) suggest increases in the federal funds rate will commence in 2015. Table 6 provides a recent history of the federal funds rate. Increases in the federal funds rate occurred during 2015 and 2016. Thus, the expected increases in the federal funds rate did materialize.

The results related to coefficient β_3 are significant and negative. These results show banks' holdings of AFS securities decline with increases of HTM securities during the study period. These results coupled with the increases in the federal funds rate support Meder's (2015) conclusion that banks are

responding to the tightening of monetary policy and not the capital ratio requirements of the Basel III Accord. Further, the results indirectly support Gombola et al.'s (2016) findings that banks' management of capital ratios has declined during the post-financial crisis period. A reasonable explanation for this change is that the effect of the increased regulation during the post-financial crisis period (e.g., Dodd-Frank, Basel III Accord, etc.) has improved banks' total capital ratios significantly. That is, banks total capital ratios exceed the well-capitalized ratio mark by a significant margin. Thus, banks have little incentive to manage their total capital ratios prior to the Basel III Accord's full implementation.

In addition to the coefficient related to AFS securities, the coefficient β_6 (LEVER) is significant and positive. Banks with higher debt are more inclined to increase their HTM holdings. These banks are responding to increased earnings volatility due to higher expected interest costs from servicing the debt. Increasing their HTM holdings is their response to a period of rising interest rates.

The coefficients β_4 and β_5 form the YEAR and SIZE variables are not significant indicating no statistically significant relationship between these variables and the dependent variable. Changes in the dependent variable are neither related to a particular year nor the banks' asset size.

Overall, the results do not support the conjecture of the financial press regarding banks' categorizing a greater share of their debt investments as HTM because of the incoming capital requirements stipulated by the Basel III Accord. A more practical explanation for the increased HTM holdings as a percentage of total debt investments is that banks are liquidating AFS securities in anticipation of increases to the federal funds rate. Banks will require more cash on hand because the banks' depositors would be inclined to use cash to pay down their existing debts or the banks' lending customers would be inclined to borrow and lock in their interest rates before further increases in the federal funds rate. In either case, banks would be required to carry cash to satisfy these demands.

One limitation of this study is that the sample consisted of large U.S. commercial banks by asset size. These banks tend to be well-capitalized and consequently are less likely to manage their capital ratios. Thus, the results cannot be generalized to foreign or smaller size banks.

CONCLUSION

This paper provides an example of a faculty and undergraduate student research collaboration and provides evidence of the extent of research that can be accomplished during a spring semester. The selection of the student collaborator, the development of the research questions and research model, the collection of the data, the processing of the statistical results, and the preparation of a poster for the university's undergraduate research symposium was completed in a single spring semester. A timeline of events is provided in Appendix A. Organization is the key element for a faculty member that wishes to undertake a faculty and undergraduate student research study in one semester. The work is demanding but the undergraduate student(s) participating in the research study would find it extremely fulfilling. The compiling and writing of this research paper occurred during the following summer and fall semesters.

This faculty and undergraduate student collaboration examines whether banks are categorizing their debt investments as HTM securities in anticipation of the upcoming changes to the Basel III Accord. Articles in the financial press suggest that banks would categorize a greater percentage of their debt investments as HTM rather than AFS (Rapoport 2015; Shenn 2014). The reason cited for this change is because of the differences in accounting for HTM and AFS securities under GAAP. On the one hand, HTM securities are recorded at amortized cost; thus, changes in the assets' market values are not reflected in earnings. Banks' capital ratios are unaffected by the changes in assets' market values under this accounting treatment. On the other hand, AFS securities are adjusted to market value; thus, the differences from changes in market values are recorded in other comprehensive income which impacts banks' capital ratios. Coupled with the anticipation of increases to the federal funds rate, asset values under the AFS classification would likely decline resulting in charges to other comprehensive income and a decline in the banks' reported capital ratios. Banks management can act opportunistically to avoid these potential adverse results by categorizing a greater percentage of the debt investments as HTM.

Results for 2014 and 2015 show large U.S. commercial banks are not acting in this opportunistic manner. The assertions of the financial press are unsupported. Rather, banks are well-capitalized and are reducing their holdings of AFS securities for liquidity reasons as the demand for cash increases during a period of monetary tightening (Meder 2015).

The results of this research study adds to the stream of literature pertaining to banks' accounting choices when encountered with changes in the economic or regulatory environment. Regulators, accounting academics, and auditors will find the results of this study useful in their work.

TABLE 1
LIST OF SAMPLE FIRMS

<u>Company Name</u>	<u>SIC</u>
1. Associated Banc Corp.	6022
2. Bank of America Corporation	6021
3. The Bank of New York Mellon	6022
4. BB&T Corporation	6021
5. BOK Financial Corporation	6021
6. Capital One Financial Corporation	6021
7. CIT Group Inc.	6021
8. Citigroup Inc.	6021
9. Cullen / Frost Bankers Inc.	6021
10. Discover Financial Services	6141
11. Fifth Third Bancorp	6022
12. First Citizens Bancshares Inc.	6022
13. First Niagara Financial Group Inc.	6021
14. First Merit	6021
15. Hancock Holding Company	6022
16. Huntington BancShares Incorporated	6021
17. JP Morgan Chase & Co.	6021
18. KeyCorp	6021
19. M&T Bank Corporation	6022
20. Northern Trust Corporation	6022
21. People's United Financial Inc.	6035
22. The PNC Financial Services Group Inc.	6021
23. Prosperity BancShares Inc.	6022
24. Regions Financial Corporation	6021
25. State Street Corporation	6022
26. Umpqua Holdings Corporation	6035
27. U.S. Bancorp	6021
28. Valley National Bancorp	6021
29. Webster Financial Corporation	6021
30. Wells Fargo & Company	6021

SIC: 6021 — national commercial bank; 6022 — state commercial bank; 6035 — savings institution, federally chartered; 6141 — personal credit institution

Source: "Insured U.S.-Chartered Commercial Banks That Have Consolidated Assets of \$300 Million or More, Ranked by Consolidated Assets," as at June 30, 2016: Website: <https://www.federalreserve.gov/releases/lbr/current/>

TABLE 2
PREDICTED SIGNS FOR THE REGRESSION COEFFICIENTS

<u>Variable</u>	<u>Coefficient</u>	<u>Predicted Sign</u>
ΔCAP_{it}	β_1	-
$THRESH_{it}$	β_2	+
ΔAFS_{it}	β_3	-
$YEAR_i$	β_4	?
$SIZE_{it}$	β_5	?
$LEVER_{it}$	β_6	+

Variable Definitions:

- $\Delta CAP_{it} = (CAP_{it} - CAP_{it-1})$ that is the change in a bank's total capital ratio;
- $THRESH_{it}$ = an indicator variable; 1 if the bank's total capital ratio is within 4% of the well-capitalized bank ratio (i.e., 10%), otherwise = 0;
- $\Delta AFS_{it} = (AFS_{it} - AFS_{it-1}) / Total Assets_{it-1}$;
- $YEAR_i$ = an indicator variable; 1 if the bank's data relates to 2014 and 0 if the bank's data relates to 2015;
- $SIZE_{it}$ = the natural log of the bank's total assets at t - 1;
- $LEVER_{it}$ = the ratio for the bank's total liabilities to total assets at t-1.

TABLE 3
DESCRIPTIVE STATISTICS FOR DEPENDENT AND INDEPENDENT VARIABLES

<u>Variable</u>	<u>Mean</u>	<u>Minimum</u>	<u>Maximum</u>	<u>Standard Deviation</u>
ΔHTM_{it}	0.0050060	-0.18974	0.18790	0.00938721
ΔCAP_{it}	-0.0042967	-0.04500	0.02160	0.01045757
$THRESH_{it}$	0.4200000	0	1.00000	0.49700000
ΔAFS_{it}	0.0078539	-0.09063	0.10553	0.03020999
$YEAR_i$	0.5000000	0	1.00000	0.50400000
$SIZE_{it}$	25.3399503	23.17738	28.57614	1.53667804
$LEVER_{it}$	0.8820188	0.81070	0.92315	0.02364261

Variable Definitions:

- $\Delta HTM_{it} = (HTM_{it} / Total Debt Investments_{it}) - (HTM_{it-1} / Total Debt Investments_{it-1})$;
- $\Delta CAP_{it} = (CAP_{it} - CAP_{it-1})$ that is the change in a bank's total capital ratio;
- $THRESH_{it}$ = an indicator variable; 1 if the bank's total capital ratio is within 4% of the well-capitalized bank ratio (i.e., 10%), otherwise = 0;
- $\Delta AFS_{it} = (AFS_{it} - AFS_{it-1}) / Total Assets_{it-1}$;
- $YEAR_i$ = an indicator variable; 1 if the bank's data relates to 2014 and 0 if the bank's data relates to 2015;
- $SIZE_{it}$ = the natural log of the bank's total assets at t - 1;
- $LEVER_{it}$ = the ratio for the bank's total liabilities to total assets at t-1.

TABLE 4
PEARSON CORRELATIONS BETWEEN THE REGRESSION VARIABLES

	ΔHTM_{it}	ΔCAP_{it}	THRESH_{it}	ΔAFS_{it}	YEAR_i	SIZE_{it}	LEVER_{it}
ΔHTM_{it}	1.000						
ΔCAP_{it}	0.146	1.000					
THRESH_{it}	0.002	-0.265 **	1.000				
ΔAFS_{it}	-0.599 ***	-0.176 *	0.016	1.000			
YEAR_i	0.085	-0.140	0.237 **	-0.138	1.000		
SIZE_{it}	0.278 **	0.154	-0.341 ***	-0.166	0.032	1.000	
LEVER_{it}	0.330 ***	0.018	0.129	-0.052	0.032	0.206 *	1.000

* indicates correlation is significant at the 10 percent level.

** indicates correlation is significant at the 5 percent level.

*** indicates correlation is significant at the 1 percent level.

Variable Definitions:

- $\Delta\text{HTM}_{it} = (\text{HTM}_{it} / \text{Total Debt Investments}_{it}) - (\text{HTM}_{it-1} / \text{Total Debt Investments}_{it-1})$;
- $\Delta\text{CAP}_{it} = (\text{CAP}_{it} - \text{CAP}_{it-1})$ that is the change in a bank's total capital ratio;
- THRESH_{it} = an indicator variable; 1 if the bank's total capital ratio is within 4% of the well-capitalized bank ratio (i.e., 10%), otherwise = 0;
- $\Delta\text{AFS}_{it} = (\text{AFS}_{it} - \text{AFS}_{it-1}) / \text{Total Assets}_{it-1}$;
- YEAR_i = an indicator variable; 1 if the bank's data relates to 2014 and 0 if the bank's data relates to 2015;
- SIZE_{it} = the natural log of the bank's total assets at t - 1;
- LEVER_{it} = the ratio for the bank's total liabilities to total assets at t-1.

TABLE 5
REGRESSION RESULTS

$$\Delta\text{HTM}_{it} = \beta_0 + \beta_1 (\Delta\text{CAP}_{it}) + \beta_2 (\text{THRESH}_{it}) + \beta_3 (\Delta\text{AFS}_{it}) + \beta_4 (\text{YEAR}_i) + \beta_5 (\text{SIZE}_{it-1}) + \beta_6 (\text{LEVER}_{it-1}) + \varepsilon_{it} \quad (1)$$

Variable	Parameter	Parameter Estimate	Standard Error	T-stat.
Constant	β_0	-0.878	0.282	-3.110 ***
ΔCAP_{it}	β_1	0.206	0.742	0.277
THRESH_{it}	β_2	0.005	0.017	0.286
ΔAFS_{it}	β_3	-1.345	0.252	-5.342 ***
YEAR_i	β_4	-0.001	0.015	-0.083
SIZE_{it}	β_5	0.006	0.005	1.214
LEVER_{it}	β_6	0.825	0.324	2.549 **

* indicates significant at the 10 percent level.
 ** indicates significant at the 5 percent level.
 *** indicates significant at the 1 percent level.

Variable Definitions:

- $\Delta\text{HTM}_{it} = (\text{HTM}_{it} / \text{Total Debt Investments}_{it}) - (\text{HTM}_{it-1} / \text{Total Debt Investments}_{it-1})$;
- $\Delta\text{CAP}_{it} = (\text{CAP}_{it} - \text{CAP}_{it-1})$ that is the change in a bank's total capital ratio;
- THRESH_{it} = an indicator variable; 1 if the bank's total capital ratio is within 4% of the well-capitalized bank ratio (i.e., 10%), otherwise = 0;
- $\Delta\text{AFS}_{it} = (\text{AFS}_{it} - \text{AFS}_{it-1}) / \text{Total Assets}_{it-1}$;
- YEAR_i = an indicator variable; 1 if the bank's data relates to 2014 and 0 if the bank's data relates to 2015;
- SIZE_{it} = the natural log of the bank's total assets at t - 1;
- LEVER_{it} = the ratio for the bank's total liabilities to total assets at t-1.

TABLE 6
HISTORY OF THE FEDERAL FUNDS RATE—JANUARY 1, 2013 TO MARCH 16, 2017

Period	Target Rate/Range (percent)
January 1 to December 31, 2013	0.00 to 0.25
January 1 to December 31, 2014	0.00 to 0.25
January 1 to December 16, 2015	0.00 to 0.25
December 17 to December 31, 2015	0.25 to 0.50
January 1 to December 14, 2016	0.25 to 0.50
December 15 to December 31, 2016	0.50 to 0.75
January 1 to March 15, 2017	0.50 to 0.75
March 16, 2017 to March 31, 2017	0.75 to 1.00

Source: "Federal Reserve Bank of New York." Website: <https://apps.newyorkfed.org/markets/autorates/fed-funds-search-page>

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APPENDIX A

Timeline and Schedule of Activities for Faculty/Student Research Project

<u>Date</u>	<u>Activity</u>
January 23, 2017	<ul style="list-style-type: none">• Send out memo to undergraduate business students requesting participation in research project• Candidates are to prepare a one page memo describing why they want to participate and what they expect to learn from the project
January 30, 2017	<ul style="list-style-type: none">• Select student
February 2, 2017	<ul style="list-style-type: none">• First meeting; future meetings are scheduled for Thursday's at 2:00PM• Discuss purpose of research project and student's expectations• Develop general "idea" of the research questions• Explain the importance of the literature review and process of selecting articles• Assign preliminary readings
February 9, 2017	<ul style="list-style-type: none">• Discuss basics of multiple regression and how to employ statistics in a research study• Discuss sample
February 16, 2017	<ul style="list-style-type: none">• Refine research questions and translate into testable hypotheses• Develop multiple regression model for the study
February 23, 2017	<ul style="list-style-type: none">• Discuss literature review in greater detail, focusing on literature streams that need to be addressed in the research paper• Develop detailed outline of research paper
March 2, 2017	<ul style="list-style-type: none">• Sample selection — 30 large banks' financial results for 2 years (60 firms); collect data
March 13, 2017	<ul style="list-style-type: none">• Run regression model; interpret and discuss results
March 16, 2017	<ul style="list-style-type: none">• Student registers for university symposium; title of research paper is, "Are banks' changes in held-to-maturity securities related to incoming capital requirements?"; abstract developed and submitted• Note: deadline for registering for university symposium is March 17th
March 24 to end of semester	<ul style="list-style-type: none">• Student prepares poster
April 13, 2017	<ul style="list-style-type: none">• Presentation at university symposium
