

**Allied Academies
International Conference**

**New Orleans, Louisiana
April 7-10, 2004**

**Academy of Commercial
Banking and Finance**

PROCEEDINGS

Table of Contents

AN EMPIRICAL STUDY OF SOUTH CENTRAL U.S.
BANKS PROFITABILITY, CREDIT QUALITY AND
LOAN GROWTH 1
Donald J. Brown, Sam Houston State University
James Bexley, Sam Houston State University
Joe F. James, Sam Houston State University

THE BEHAVIOR OF CREDIT CARD
INTEREST RATES DURING THE DECLINE
IN OTHER INTEREST-RATE MARKETS 3
Stephen T. Evans, Southern Utah University

ANALYSIS OF THE RATIO ADJUSTMENT PROCESS
AND THE CONTRIBUTION OF FIRM-SPECIFIC
FACTORS: A PRELIMINARY REVIEW 9
Sharon S. Seay, Mississippi College
Sarah T. Pitts, Christian Brothers University
Rob H. Kamery, Christian Brothers University

A RESEARCH METHODOLOGY FOR ENHANCING
THE UNDERSTANDING OF THE RATIO
ADJUSTMENT PHENOMENON 15
Sharon S. Seay, Mississippi College
Sarah T. Pitts, Christian Brothers University
Rob H. Kamery, Christian Brothers University

EMPIRICAL DETERMINANTS OF SECURITIZATION
AND OFF-BALANCE-SHEET ACTIVITIES IN BANKING 21
Christopher Ngassam, Virginia State University

Authors' Index 29

AN EMPIRICAL STUDY OF SOUTH CENTRAL U.S. BANKS PROFITABILITY, CREDIT QUALITY AND LOAN GROWTH

Donald J. Brown, Sam Houston State University

fin_djb@shsu.edu

James Bexley, Sam Houston State University

fin_jxb@shsu.edu

Joe F. James, Sam Houston State University

fin_jfj@shsu.edu

ABSTRACT

The U.S. economy is in the recovery stage from a recession that apparently began in March 2001 and probably ended in the first half of 2002. Banks have remained very profitable over this recession and recovery period. However, there has been concern expressed that declining credit quality might become a problem.

This paper is an empirical analysis of the performance, credit quality and loan growth of banks located in the seven South-Central U.S. states, of Arkansas, Louisiana, Mississippi, Oklahoma, New Mexico, Tennessee and Texas. We used FDIC data, which we received from Stratis Technologies, of Louisville, Kentucky, to analyze performance ratios such as the Return on Assets and the Return on Equity which were then compared to the average for all U.S. banks. Non-performing loans and loan charge offs for these states were compared to the national average. Finally, the average loan growth rates for these states were then compared to the average loan growth of all U.S. banks.

Preliminary analysis of the performance, credit quality and loan growth of the banks in these seven South-Central states, shows that they compare favorably with the national averages in all the above areas. In fact in the credit quality and loan growth categories the majority these seven banks consistently exceeded the national averages.

THE BEHAVIOR OF CREDIT CARD INTEREST RATES DURING THE DECLINE IN OTHER INTEREST-RATE MARKETS

Stephen T. Evans, Southern Utah University
evans_s@suu.edu

ABSTRACT

The three-year period beginning in December 2000 saw historic declines in the interest rates in most financial markets including 15 reductions in the key rates established by the Federal Reserve. However, interest rates in the credit-card industry gave mixed signals with some rates remaining "sticky" or inelastic.

While other studies have identified the mathematical relationships between credit-card interest rates and the discount rate, federal funds rate, and prime rate, this study looks at both the "introductory rates" charged by credit-card providers as well as the "ongoing rates" following the introductory period. It also focuses solely on the rates contained in the mailed advertising materials sent by national credit-card marketers.

The evidence shows that "introductory rates" have declined at approximately the same rate as other interest-rate markets. However, the "ongoing rates" have been independent of other rate declines and, in fact, have increased during the three-year period.

INTRODUCTION

Although some consider 1949 to be the beginning of the modern credit-card era (Brooker, 2004), the genesis of this innovation certainly goes back to the early 1900s. In 1914, for example, Western Union was using metal cards to allow its best customers to defer payments, and the cards became known as "Metal Money" (ETI, 2003).

The use of credit cards was prohibited during World War II. But the practice re-emerged in the late 1940s, especially when the Diner's Club card was instituted to allow customers to use one card to charge purchases from many retailers. The success of this "one card for many businesses" encouraged others, and the 1950s was really the period when financial intermediaries began handling credit cards for other organizations.

In the 1960s, credit-card organizations emerged that issued licensing agreements to other financial intermediaries. The Bank of America, for example, created the Bank-Americard (later known as Visa) and it licensed its use to other banks. The 1970s saw the main movement in credit-card internationalization, and the 1980s were characterized by the development of ATM machines. Credit-card usage exploded in the 1990s with the computer revolution and Internet, and the trend continues into the 21st Century.

The credit-card phenomenon has consistently grown faster than the economy as a whole and has had a powerful impact on it. By 2002, "well over one billion cards (were) in circulation (with) the average household (having) about a dozen credit cards" (CFA, 2003). In 2003, for the first time in history, Americans bought more with cards than with cash" (Brooker, 2004), and the industry now generates \$2 trillion in transactions per year (Brooker, 2004), facilitating nearly 20 percent of the economy.

While a positive impact on the economy, there is also great concern because credit use has grown fastest among debtors with the lowest incomes. For example, "by 2000, about one-third of lower income families spent more than 40% of their income on debt repayment" (CFA, 2003). The numbers paint a sad picture of low, moderate and middle income citizens caught in impossible burdens of debt plus mounting fees and late charges" (Nader, 2004). The high credit-card interest rates is a cause for concern, but an additional problem is the fact that the credit-card rates do not respond to interest-rate declines in other markets, and this "stickiness" of interest rates has been the focus of much research.

LITERATURE SEARCH

In an early study on interest rates, it was recognized that the industry is a paradox with near-perfect competition but with interest rates that are unresponsive to the markets (Ausubel, 1991). Possible reasons cited are cardholders who don't expect to pay on unpaid balances (Ausubel, 1991), high search and switch costs in other forms of borrowing (Calem and Mester, 1995), and transaction costs in other options (Brito, 1995).

As to the actual relationship between traditional interest rates and credit-card rates, one author found mathematical evidence that the federal funds rate affects credit-card rates to a small degree, but the prime rate and cost of funds have no impact on credit-card rates (Yu Hsing, 2003). And finally, a more recent article provided evidence that showed drops of 4.75% in the rates set by the Federal Reserve but only a 1.35% decline in credit-card rates (CFA, 2003).

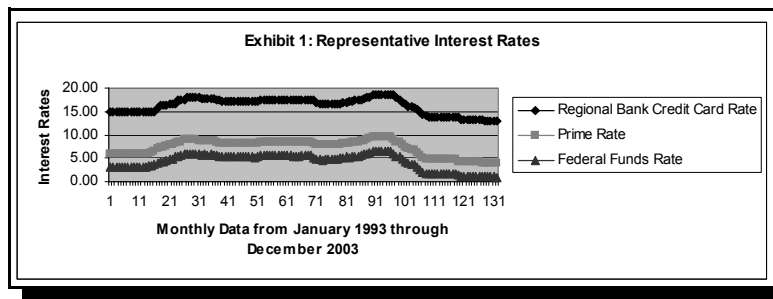
METHODOLOGY

Building on the solid contributions of other researchers, this study focused solely on the advertising materials that have been sent from the national advertisers of credit cards as opposed to industry data for all providers. Also, other studies have focused almost solely on the so-called regular interest rates charged over time, but this study also focused on the introductory rates that are contained in the advertising materials. Using a sample of 120 advertising flyers from 30 national marketers received over the 36-month period from 2001 through 2003 (when other rates were falling), the credit-card rates were compared to interest rates in other markets.

The four hypotheses were that (1) "introductory rates" have been declining over the three-year period in question, (2) these "introductory rates" have been declining faster than other general interest rates in society, (3) the "ongoing rates" following the introductory periods have not been declining, and (4) the "ongoing rates" have actually been rising during the period of decline for other interest rates.

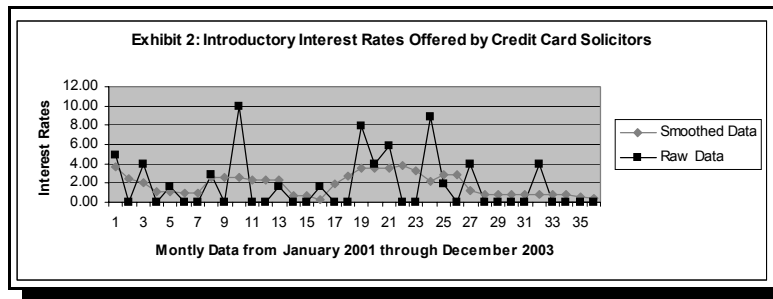
THE RESEARCH

It seemed crucial to begin the analysis by establishing the general pattern of interest rates, and that did prove helpful both for its orientation and for identifying the most fertile period of time for analysis. Over an 11-year period from January 1993 through December 2003, the federal funds rate (that banks charge each other), and the prime rate (that banks charge their best customers) were selected for their representative characteristics. Also, credit-card interest rates charged by a mid-sized, regional bank with local ties to customers were also selected to represent typical credit-card interest rates (as opposed to the industry segment with aggressive national solicitors). These three rates are shown in Exhibit 1 and show a strong lock-step relationship.



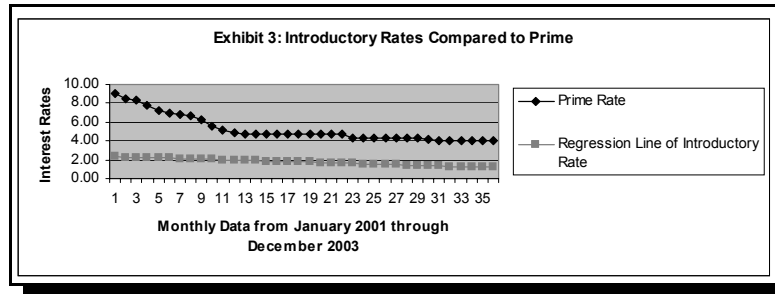
It can also be readily observed in Exhibit 1 that the period of time from January 2001 (data point #97) through December 2003 saw a significant drop in interest rates in other financial markets. That provided an opportunity to observe whether credit-card rates generally respond to declines in other interest rates.

As previously mentioned, both the introductory interest rates shown in the advertising flyers as well as the ongoing rates after the introductory period were the focus of this study, and the information shown below in Exhibit 2 shows the average introductory interest rates advertised each month over the 36-month evaluation period.

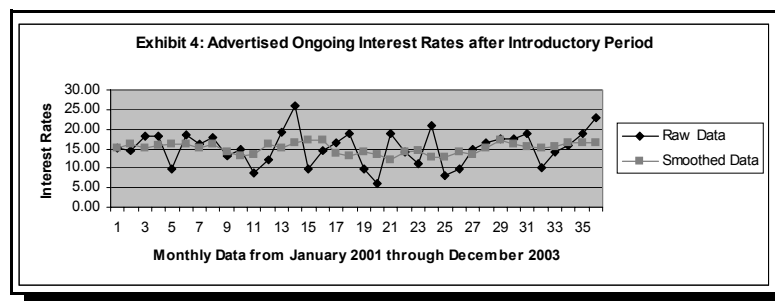


Notice that the introductory rates "jump around" a lot because each of the companies has a different strategy with some using low introductory rates as enticements and others using other enticements. Even with the smoothing technique that has been added (five-month running averages), it is not easy to see the trend, but the regression line for the introductory rates is shown in Exhibit 3 along with actual prime rate data for the same 36-month period. As shown, both rates

have declined during the period but there is a slightly different pattern. The decline is steeper for the prime rate in 2001, but both are more comparable in 2002 and 2003.



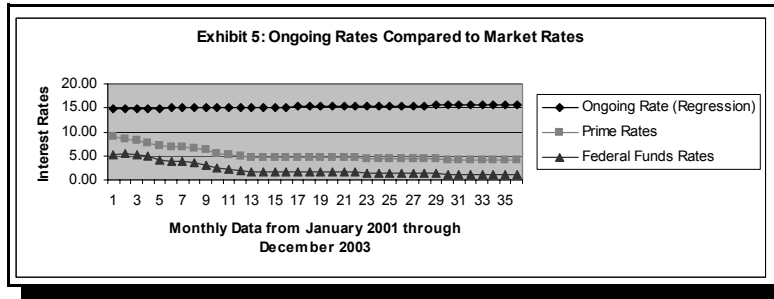
The correlation coefficient of the introductory-rate is only $+0.122547$, so it would be hard to use the data to predict a rate offer for a given month, but the 120 randomly selected data points do provide sufficient information to make inferences about the trend. The calculated y-intercept is $+2.350635$, the value of the slope is -0.032317 , and the data is statistically significant in confirming the first hypothesis that the introductory rates charged by the national credit-card marketers did drop significantly during the 36-month period. But the data analysis did not provide conclusive evidence relating to the second hypothesis. For the entire 36 months, the introductory rates dropped less statistically than the prime rate, but part of that was the fact that there was not much more room to go when many of the rates were already at zero. Also, during the last two years the slopes were comparable, so the data on the second hypothesis was considered inconclusive.



As to the advertised "ongoing interest rates" (after the introductory periods), the rates also "jumped all over" because of differing marketing strategies used by the marketers. Consequently, the data, with a low correlation coefficient of $+0.056764$ would hardly be helpful in predicting a rate offer for a specific month, but the sum total of the 120 randomly selected data points is statistically significant in defining the ongoing trend. With a smoothing procedure added, the data is shown above in Exhibit 4.

For the data on ongoing rates, a regression analysis identified the Y-intercept as $+14.80467$ and the slope as $+0.023802$. This regression line is shown in Exhibit 5 on the following page along with data for the Prime Rate and Federal Funds Rate. The data is statistically significant in confirming the third hypothesis—namely that the ongoing interest rates charged by the national marketers of credit cards have been unresponsive to declines in interest rates in other markets and

remain at a fairly high level. The positive value for the slope also shows a slight increase over the three-year period, but the data was not considered significant enough statistically to confirm the fourth hypothesis. The evidence does not support the idea that the increase in interest rates is part of an industry trend.



Summary of Regression and Correlation Values				
		Intercept	Slope	Correlation Coefficient
Data for 36 months	Ongoing Rates	+14.80467	+0.023802	+0.056764
	Prime Rate	+7.454508	-.119718	+0.872041
	Federal Funds Rate	+4.416365	-.118332	+0.869246
	Introductory Rates	+2.350635	-.032317	+0.122547

A summary of the statistical data is shown in the table above, and the data does provide clear evidence of a continuing decline in the introductory rates and inelasticity in the ongoing rates. Other evidence suggests that introductory rates have declined partly because of declines in other interest markets but probably more because of competitive pressures in competing for new customers. But that is not true of the ongoing rates. Surveys show that a majority of cardholders are not even aware of the ongoing rates that they pay, so there is no incentive for the credit-card providers to lower the rates.

SUMMARY AND CONCLUSION

The focus of this study was 120 randomly selected advertising flyers from national credit-card marketers from January 2001 through December 2003 (a period of decline in other interest rates). As to the hypotheses that were tested, (1) the "introductory rates" offered by these companies have declined significantly in the 36-month period; (2) there is insufficient statistical evidence that the "introductory rates" have declined faster than general interest rates; (3) the

"ongoing interest rates" after the introductory periods have remained unaffected by declines in other interest rates, and (4) although there was a slight increase in ongoing rates, the increase over the 36-months was not strong enough to conclude that it is a statistically significant upward trend.

REFERENCES AVAILABLE UPON REQUEST

ANALYSIS OF THE RATIO ADJUSTMENT PROCESS AND THE CONTRIBUTION OF FIRM-SPECIFIC FACTORS: A PRELIMINARY REVIEW

Sharon S. Seay, Mississippi College

seay@mc.edu

Sarah T. Pitts, Christian Brothers University

spitts@cbu.edu

Rob H. Kamery, Christian Brothers University

Rkamery@cbu.edu

ABSTRACT

This paper seeks to enhance the understanding of the ratio adjustment phenomenon by investigating the association between certain firm-specific factors and the rates of ratio adjustment (\ddot{e}) and of expectation (target) adjustment (\ddot{a}). The firm-specific factors considered here are supported by agency arguments and have been used in prior research dealing with the earnings effects of accounting choice. The hypothesized relationships between the firm-specific factors and ratio adjustment were tested on a random sample of U.S. corporations over an 18-year period ending in 1988.

INTRODUCTION

A two-stage regression procedure was employed in this study. In stage one, the Marquardt nonlinear regression procedure was used to estimate the components of ratio and expectation adjustment (\ddot{e} and \ddot{a}) for each firm across the 18-year period for each of the seven financial ratios tested. A partial adjustment adaptive expectations model was employed in stage one. In stage two, stage one results (\ddot{e} and \ddot{a}) were regressed on four firm-specific variables (size, market share, beta, and debt/equity) to assess the association between firm-specific factors and the two components of ratio adjustment (\ddot{e} --the speed of adjustment to the target, and \ddot{a} --the speed with which managers adjust their expectations regarding stability of the target measure). Initially, the industry mean was chosen to proxy for the target measure. To assess the sensitivity of the empirical results to this measure, the same tests were repeated using the median as the target. Also, the sensitivity of the ratio adjustment measures to different measurement periods was assessed by repeating the tests on the same sample of firms but including only the most recent 10 years of data. The results did provide moderate support for the association between firm-specific factors and ratio adjustment. The median proved to be a slightly better target measure than the mean as evidenced by higher R^2 's and F-statistics. Results obtained from reducing the sample to include only 10 years of data indicated higher R^2 's than those achieved for the full sample, yet lower than those achieved when the median is employed as the target measure.

EARLY USE OF RATIO ANALYSIS

A preponderance of evidence suggests that since the late 1800s, ratio analysis has been widely used in the analysis and valuation of published financial data. During much of this time, security analysis firms (e.g., Dun & Bradstreet) have published, and presumably have profited from publishing, listings of annual financial ratio values for various firms and industries. The literature on financial statement analysis, as well as accounting and finance textbooks, emphasizes the use of ratio analysis. Additionally, auditors are now required under *SAS No. 56, Analytical Procedures*, to use analytical procedures in the planning and final review stages of a financial statement audit. Ratio analysis is an analytical procedure that can assist the auditor in evaluating the reasonableness of financial statement amounts. The demand for financial ratio data provides some supportive evidence of the utility of this information.

Ratios derived from financial statements are used extensively by both practitioners and researchers (Gibson, 1982; Whittington, 1980). Whittington (1980) identified two principal uses of financial ratios: “the traditional, normative use of the measurement of a firm’s ratio compared with a standard (usually an industry norm), and the positive use in estimating empirical relationships, usually for purposes of prediction.” This positive use of financial ratios has typically been of two types: (1) by accountants and analysts in evaluating firm performance and forecasting future financial variables for the firm, and (2) by researchers in statistical models for mainly predictive purposes, such as bankruptcy prediction (Altman, 1968; Ohlson, 1980), credit rating (Pinches & Mingo, 1973), security analysis (Reilly, 1986), audit evaluation (Altman & McGough, 1974), assessment of risk (Beaver, 1966), identification of the characteristics of takeover targets (Rege, 1984; Belkaoui, 1978), and the assessment of the incremental information content of earnings- and nonearnings-based financial ratios (Hopwood & Schaefer, 1988).

Despite the extensive use of ratio information, little progress has been made in providing a satisfactory theory of financial ratios as called for by Horrigan (1968). The inclusion of selected financial ratios in research studies has been largely *ad hoc* with little theoretical or empirical validation. Traditionally, ratios have been used by the practitioner to compare individual firms with industry norms. Yet, few guidelines exist in the accounting and finance literature for determining the location measure most appropriate as a standard or norm for comparative analysis. Tradition and convenience have made the ratio method an appealing means of analyzing financial data. However, frequently the methodological assumptions implicit in the ratio specification are unknown and overlooked.

PROBLEM STATEMENT

There is considerable evidence that financial ratios are widely used by managers, analysts, creditors, and investors. A survey by Gibson (1982) of the views of financial executives on important issues relating to financial ratios indicated that financial ratios are an important tool in managing a company and analyzing its financial results. In addition, 93 of the 100 respondents to the survey indicated that their firms use financial ratios as part of their corporate objectives. Further, evidence exists which suggests that firms adjust their financial ratios to industry norms. Previous research into the ratio adjustment phenomenon has found that firms, even within an industry, vary

in the rate of adjustment. This study seeks to enhance the understanding of the ratio adjustment phenomenon by examining the association between certain firm-specific factors and the rates of ratio adjustment and of expectation (target) adjustment. The firm-specific factors to be considered are supported by agency arguments and have been used in prior research dealing with the earnings effects of accounting choice. The hypothesized relationships between these factors and ratio adjustment will be tested on a random sample of U.S. corporations over an 18-year period ending in 1988.

Even though ratios derived from financial statements are used extensively by practitioners and researchers for purposes of performance evaluation and prediction, little is known about the nature of financial ratio information, i.e., its distributional properties, industry norm or target selection, the ratios which best represent financial ratio information classification category, and the ratio adjustment process itself.

Since ratio information is often used, it is imperative that a theory of financial ratios be developed so that we may better understand what drives the financial ratio adjustment process. Usefulness of ratio information derived from financial statements hinges on understanding how and why ratios change over time. By understanding the factors driving ratio adjustment to target levels, we can gain insights into the utility of ratio information for performance evaluation and prediction purposes. The objectives of this preliminary study are:

- (i) To investigate the association between firm-specific factors and the ratio adjustment process.
- (ii) To provide descriptive evidence of the rate of ratio adjustment across different financial ratios.
- (iii) To assess the sensitivity of the ratio adjustment measures to different time periods and target measures.

By contributing to the understanding of the ratio adjustment process, this paper may provide information useful in the development of a theory of financial ratios. A by-product of this paper will be the insights and implications regarding the stationarity of the partial adjustment adaptive expectation model and the stability of the industry target over time.

A model is only useful for predictive purposes if the underlying relationships and parameters are stable over time. Since one use of financial ratio data is for prediction, an important issue is how these ratios change over time. The study will address this issue and provide a further basis for the formulation of testable hypotheses about the predictive and descriptive utility of financial statement information.

FIRM-SPECIFIC FACTORS AND RATIO ADJUSTMENT

Although prior research provides evidence of size and industry effects on the rate of ratio adjustment, results do not show a unique industry effect on the adjustment pattern of all financial ratios tested. When industry-wide factorial control is implemented, there still exists variation across firms within the same industry in the pattern of ratio adjustment to the assumed target. Variations exist in the speed of adjustment to the norm (target) as well as in the rate at which firms adjust their expectations regarding the stability of the norm. Since firms within the same industry do not show a unique industry effect on the adjustment pattern of all financial ratios, further research is needed to examine whether important firm-specific factors such as size, risk, contractual relations, and

ownership control may directly contribute to the variations in adaptation and adjustment and better explain the pattern of ratio adjustment.

One implication of this study is an assessment of the effect of the rate of ratio adjustment on our understanding of the determinants of accounting choice. Since the selection of accounting rules depends on the expected accounting numbers or ratios (Givoly, 1985), it is anticipated that accounting actions will also vary across firms. There is variation across firms in the process of adjusting financial ratios to the assumed target. Adaptive expectations vary across firms of different sizes and industries (Lee & Wu, 1988). Thus, the present study has implications for understanding accounting choices.

In traditional financial analysis, firms' financial ratios are related to predetermined targets that are usually based on industry norms. Empirical evidence by Lev (1969), Frecka and Lee (1983), Lee and Wu (1988), Fieldsend, Longford and McLeay (1987), and Tippett (1990) has generally indicated that firms adjust their financial ratios to industry norms. The mechanisms used to affect this adjustment have usually been attributed to active attempts by management or passive industry-wide effects operating on the firm.

The use of accounting choice among alternative accounting procedures is only one way to adjust financial ratios to predetermined targets. Managers can include the desired ratios in their operating plans and then regulate business operations such that the resultant ratios will conform with the target levels. For example, a firm might change its terms of credit sales to achieve a more desirable current ratio. Lease vs. purchase choices, make vs. buy decisions, and the degree of operating and financial leverage employed by the firm could also be examples of investment and financing techniques used by managers to adjust their ratios to target levels. Moreover, when the target is an industry average, ratios can be adjusted to some extent by allowing industry-wide effects to operate on them. This is a passive adjustment, as opposed to the active techniques described above.

CONCLUSION

In this study, industry-wide effects are controlled for. The focus of this research is the effect of firm-specific factors on the ratio adjustment process. This research may also enhance our understanding of accounting choice. The existing research on earnings-based accounting choice does not consider ratios. It is reasonable to believe that managers consider both. Significant results from the current research may indicate our theory of accounting choice is incomplete.

REFERENCES

- Altman, E.I. (1968). Financial ratios, discriminant analysis and the prediction of corporate bankruptcy. *Journal of Finance*, 9, 589-609.
- Altman, E.I. & T.P. McGough (1974). Evaluation of a company as a going concern. *Journal of Accountancy*, 12, 50-57.
- Beaver, W. (1966). Financial ratios as predictors of failure: Empirical research in accounting, selected-studies 1966. Supplement to *Journal of Accounting Research*, 71-111.

- Belkaoui, A. (1978). Financial ratios as predictors of Canadian takeovers. *Journal of Business, Finance and Accounting*, Spring, 93-107.
- Frecka, T. & C.F. Lee (1983). Generalized financial ratio adjustment processes and their implications. *Journal of Accounting Research*, Spring, 308-316.
- Gibson, C.H. (1982). How industry perceives financial ratios. *Management Accounting*, 4, 13-19.
- Givoly, D. (1985). The formation of earnings expectations. *The Accounting Review*, 7, 372-386.
- Hopwood, W.S. & T.F. Schaefer (1988). Incremental information content of earnings and nonearnings-based financial ratios. *Contemporary Accounting Research*, Fall, 318-42.
- Horrigan, J.O. (1968). A short history of financial ratio analysis. *Accounting Review*, 4, 284-294.
- Lee, C.F. & C. Wu (1988). Expectation formation and financial ratio adjustment processes. *The Accounting Review*, 4, 292-306.
- Ohlson, J.A. (1980). Financial LRatios and the probabilistic prediction of bankruptcy. *Journal of Accounting Research*, Spring, 109-131.
- Pinches, G.E. & K.A. Mingo (1973). A multivariate analysis of industrial bond ratings. *Journal of Finance*, 3, 1-18.
- Rege, U.P. (1984). Accounting ratios to locate takeover targets. *Journal of Business, Finance and Accounting*, Autumn, 391-311.
- Reilly, F.K. (1986). *Investments*. New York: The Dryden Press.
- Tippett, M. (1990). An induced theory of financial ratios. *Accounting and Business Research*, 21 (81), 77-85.
- Whittington, G. (1980). Some basic properties of accounting ratios. *Journal of Business, Finance and Accounting*, Summer, 219-232.

A RESEARCH METHODOLOGY FOR ENHANCING THE UNDERSTANDING OF THE RATIO ADJUSTMENT PHENOMENON

Sharon S. Seay, Mississippi College

seay@mc.edu

Sarah T. Pitts, Christian Brothers University

spitts@cbu.edu

Rob H. Kamery, Christian Brothers University

rkamery@cbu.edu

ABSTRACT

A two-stage regression procedure was employed in this study, which seeks to enhance the understanding of expectations (targets) adjustment and of the ratio adjustment phenomenon by investigating the association between certain firm-specific factors and the ratio adjustment. In stage one, the Marquardt nonlinear regression procedure was used to estimate the components of ratio and expectation adjustment (\bar{e} and \bar{a}) for each firm across the 18-year period for each of the seven financial ratios tested. A partial adjustment adaptive expectations model was employed in stage one. In stage two, stage one results (\bar{e} and \bar{a}) were regressed on four firm-specific variables (size, market share, beta, and debt/equity) to assess the association between firm-specific factors and the two components of ratio adjustment (\bar{e} --the speed of adjustment to the target, and \bar{a} --the speed with which managers adjust their expectations regarding stability of the target measure). Initially, the industry mean was chosen to proxy for the target measure.

SAMPLE SELECTION

A random sample of firms was obtained from Standard and Poor's COMPUSTAT file for the period 1969-1988. The following restrictions were applied to the sample: 1. Restriction A: The sample is restricted to firms with no missing data for the entire 20-year period. 2. Restriction B: The sample is restricted to industries with at least ten firms.

COMPUSTAT's four-digit industrial classification was used as the basis for identifying industry groups. The first restriction was required because least-squares regressions are applied in this study to each individual firm. A small number of observations that were incomplete due to missing data could render the results statistically meaningless. The second requirement, restricting the sample to large industries (as measured by the number of firms), was imposed so that the industry mean would be less sensitive to the individual firms' ratios which are used to compute the mean. In the case of less concentrated industries, the effect of any firm's ratio on the mean is negligible.

RATIO SELECTION

The seven ratios to be included in empirical analyses are in Table 1.

Table 1 Ratio Selection	
<u>Category</u>	<u>Ratio Chosen</u>
Short-term Liquidity	1. Current ratio
Return on Investment	2. Net income/total assets
Financial Leverage	3. Liabilities/total stockholders' equity
Cash Position	4. Cash/total assets
Inventory Intensiveness	5. Inventory/sales
Capital Intensiveness	6. Sales to total assets ratio
Receivables Intensiveness	7. Receivables/inventory

One representative ratio from each category is generally considered sufficient, since ratios within a category have been found to be highly correlated with each other. The ratios were chosen from the seven-factor classification system developed by Pinches, Mingo, and Caruthers (1973), who employed factor analysis in examining the interrelationships among financial ratios. These classifications summarize empirical relationships among financial ratios, but they are essentially independent and have been determined to have long-term stability, even when the magnitudes of the financial ratios are undergoing change. Initially, arithmetic means for each industry group proxy for the target ratio, although, the sensitivity of the empirical results to this measure were assessed.

CHOICE OF INDUSTRY NORM (TARGET)

Determination of the correct target ratios is important for the analysis of financial ratio adjustment. Waud (1966) and Doran and Griffith (1978) have shown that the way managers forecast desired targets can affect the pattern of the ratio adjustment process.

The choice of an industry standard depends to a large extent on the cross-sectional distributional properties of financial variables. However, available theories pertaining to the use of financial variables rarely specify a unique industry measure. Although little is known about these distributional properties, Deakin's study (1976) indicates that assumptions of normality for financial accounting ratios would not be tenable except in the case of total debt/total assets. Transformation of the data (square roots and the natural logs of the data) does achieve normality in certain cases. There is also an indication that financial accounting ratios might be more normally distributed within a specific industry group. Lev and Sunder (1979) indicate the appropriateness of the mean for normally distributed variables and the median for lognormally distributed variables as the most representative industry-wide measures of location.

Tippett (1990) and Fieldsend, Longford, and McLeay (1987) support the computation of the industry target as the geometric mean (median) of the individual firm ratios. The median of the industry ratio distribution is often used as a standard for ratio evaluation such as in Dun and Bradstreet's *Key Business Ratios*. The reasons given for this choice of the median are generally related to its robustness to outliers and measurement errors. Unfortunately, for some standard cases, the distribution of the median is not known. This places limits on the relevance of the median as an industry norm.

This study uses both the mean and the median as targets to see if results differ with the different targets. The mean has been used in previous studies on the ratio adjustment process (Lev, 1969; Frecka and Lee, 1983; Lee and Wu, 1988). Using the mean as the industry target in the proposed study is consistent with previous studies and facilitates comparisons of this study's results with earlier studies. Use of the median as the industry target provides a basis to discern whether comparisons exist with results obtained using the mean as the target. Use of both parameters will provide more information and facilitate comparisons between the parameters themselves and between this study's results and results from earlier studies. This may provide useful insights regarding parameter choice in developing a theory of financial ratios.

FIRM-SPECIFIC VARIABLES

Firm-specific variables used to proxy for political costs, contractual relations, and ownership control are described in Table 2:

<u>Variable</u>	<u>Operational Definition</u>
Size	Measured by total assets
Market share	Calculated as firm sales/industry sales
Risk	Measured by the beta of the firm's stock
Debt/equity ratio	Total debt/equity
Ownership control	Largest percentage held by a single party Officers and directors as a group

Information regarding ownership control will be collected from proxy statements filed with the SEC.

ESTIMATION PROCEDURES AND STATISTICAL TESTS--STAGE ONE

A two-stage regression procedure is employed. First, the Marquardt nonlinear least-squares regression method is used to estimate the structural parameters of the generalized model, equation (9). These least-squares regressions will be used to estimate the coefficients of

$$y_t = a_0 + \lambda \bar{\delta}_t + (2 - \lambda - \delta)y_{t-1} - (1 - \lambda)(1 - \delta)y_{t-2} + u_t$$

$$t = 3, \dots, 20$$

for ratios 1-7 for each of the firms in the sample. Y_t , which could also be written $y_{k,t}$, is the firm's financial ratio k for the year t ; x_t , which could also be represented by $x_{k,t}$, is the arithmetic mean of the ratio k for the industry in the year t ; y_{t-1} or $y_{k,t-1}$ is a firm's financial ratio k lagged by one year ($t - 1$); y_{t-2} or $y_{k,t-2}$ is a firm's financial ratio k lagged by two years ($t - 2$); u_t is an error term; a_0 is the intercept; $\bar{\delta}$ equals the speed of the partial adjustment coefficient; and $\bar{\alpha}$ equals the speed of the expectation adjustment coefficient. ($k = 1, \dots, 7$ represents the seven financial ratios tested.)

The overall results for the full sample will be summarized to present the cross-sections distribution of parameter estimates obtained when equation (9) is applied to the data. Results will be studied for each of the seven financial ratios tested.

Industry Norms

There are numerous commonalities in accounting techniques, production technologies, and socioeconomic constraints for firms in the same industry. Cross-sectional differences in many financial ratios were related to industry characteristics. Ratios are used to control for (hold constant) factors (e.g., technology) which affect all firms within a homogenous group such as an industry. This is generally done by incorporating in the analysis industry-wide standards, such as the industry mean or median ratios, intended to enable the investigator to focus on the firm-specific component of the ratio after the common effects of various factors on all firms within the group have been accounted for. The frequently used financial analysis technique of comparing the ratios of individual firms to an industry standard and drawing inferences from the sign and size of the differences provides one example of control for the effect of factors common to all firms within the specified group. Such a method is employed in this study.

Stage Two

Once $\bar{\delta}$ and $\bar{\alpha}$ estimates are obtained for each of the seven financial ratios, then $\bar{\delta}$ and $\bar{\alpha}$ will each be regressed on the five firm-specific explanatory variables as shown below in the second stage of the two-stage regression procedure. The multivariate tests will employ ordinary least-squares regression with and as the dependent variable respectively:

$$\begin{aligned} &= c_0 + c_1 \text{ SIZE} + c_2 \text{ MKSH} + c_3 \text{ BETA} + c_4 \text{ DEBT} + c_5 \text{ OWN} + u \\ &= d_0 + d_1 \text{ SIZE} + d_2 \text{ MKSH} + d_3 \text{ BETA} + d_4 \text{ DEBT} + d_5 \text{ OWN} + u \end{aligned}$$

CONCLUSION

Equation (9) was estimated by the Marquardt nonlinear least-squares regression method. These least-squares regressions were used to estimate the coefficients of the model ($\bar{\delta}$ and $\bar{\alpha}$) for each of the firms in the sample.

The overall results of the nonlinear regressions show evidence of both partial adjustment and adaptive expectations. The explanatory power of the model is relatively high, as indicated by the values of R^2 . Most of the intercept estimates are quite small and statistically insignificant.

REFERENCES

- Doran, H.E. & W.E. Griffith (1978). Inconsistency of the OLS estimator of the partial adjustment adaptive expectations model. *Journal of Econometrics*, 4, 133-146.
- Fieldsend, S., N. Longford & S. McLeay (1987). Ratio analysis: A variance component analysis. *Journal of Business, Finance and Accounting*, Winter, 497-517.
- Frecka, T. & C.F. Lee (1983). Generalized financial ratio adjustment processes and their implications. *Journal of Accounting Research*, Spring, 308-316.
- Lee, C.F. & C. Wu (1988). Expectation formation and financial ratio adjustment processes. *The Accounting Review*, 4, 292-306.
- Lev, B. (1969). Industry averages as targets for financial ratios. *Journal of Accounting Research*, Autumn, 290-299.
- Lev, B.B. & S. Sunder (1979). Methodological issues in the use of financial ratios. *Journal of Accounting and Economics*, 1, 187-210.
- Pinches, G.E. & K.A. Mingo (1975). A multivariate analysis of industrial bond ratings. *Journal of Finance*, 3, 1-18.
- Pinches, G.E., A. Eubank, K. Mingo & J. Caruthers (1975). The hierarchical classification of financial ratios. *Journal of Business Research*, 10, 295-310.
- Pinches, G.E., K. Mingo & J. Caruthers (1973). The stability of financial patterns in industrial organizations. *Journal of Finance*, 5, 295-296.
- Rege, U.P. (1984). Accounting ratios to locate takeover targets. *Journal of Business, Finance and Accounting*, Autumn, 391-311.
- Reilly, F.K. (1986). *Investments*. New York: The Dryden Press.
- Ronen, J. & S. Sadan (1975). Classificatory smoothing: Alternative income models. *Journal of Accounting Research*, Spring, 133-149.
- Ronen, J. (1981). Accounting classification as a tool for income prediction. *The Journal of Accounting, Auditing, and Finance*, Spring, 339-353.
- Schiff, M. (1966). Accounting tactics and the theory of the firm. *Journal of Accounting Research*, Spring, 62-67.
- Siegfried, J. (1975). The determinants of antitrust activity. *Journal of Law and Economics*, 10, 559-581.
- So, J. (1987). Some empirical evidence on the outliers and non-normal distribution of financial ratios. *Journal of Business, Finance and Accounting*, Winter, 483-496.
- Smith, C.W. & J.B. Warner (1979). On financial contracting: An analysis of bond covenants. *Journal of Financial Economics*, 7(6), 117-161.
- Tippett, M. (1990). An induced theory of financial ratios. *Accounting and Business Research*, 21 (81), 77-85.
- Waud, R.N. (1966). Small sample bias due to misspecification in the "partial adjustment" and "adaptive expectations" models. *Journal of the American Statistical Association*, 12, 1130-1152.

EMPIRICAL DETERMINANTS OF SECURITIZATION AND OFF-BALANCE-SHEET ACTIVITIES IN BANKING

Christopher Ngassam, Virginia State University
cngassam@vsu.edu

ABSTRACT

One important recent trend in bank structure has been increasing utilization of standby letters of credit, loan sales, and other securitized instruments. Previous attempts to explain this growth can be separated into two distinct approaches: Theories which attempt to explain what incentives exist for banks to securitize and theories which attempt to explain the incentives for borrowers to select securitize debt. The bank incentive theories provide testable implications about how banks which securitize should differ in structure from those which do not. Borrower incentive theories may be tested by examining the relative riskiness (quality) of borrowers who securitize their debt and those who use traditional debt financing.

This research presents empirical evidence on these theories utilizing data on standby letters of credit (SLCs). Results from analysis of bank financial statement data fail to verify the implications of either the regulatory costs hypothesis of Baer and Pavel (1988) or the collateralization hypothesis of Benveniste and Berger (1986). Tests using bond rating data on municipalities tends to support the empirical implications of the Greenbaum and Thakor (1987) model as well as implications of the collateralization hypothesis derived by James (1988).

INTRODUCTION

One of the most momentous changes in the structure of financial institutions in the past two decades has been the increasing popularity of securitized instruments. Beginning in the 1970's banks began to dramatically increase the amount of services that they provided "off balance sheet." That is, in addition to their more traditional loan and deposit services, they were increasingly engaged in contingent commitment banking activities and other fee revenue services. These contingent commitments are not represented as liabilities on the banks' balance sheets. Banks also increased the volume of loans that they sold to investors, removing the loan from the assets of the bank and turning loan generation into a fee revenue service.

Theorists and empiricists alike have studied this phenomenon. There has been a great deal of attention paid to the rapid growth of loan sales and standby letters of credit, for example, and many different theories have been developed to explain both the causes and implications of this growth. This paper provides evidence regarding several alternative theories of securitization, most especially the regulatory costs hypothesis of Baer and Pavel (1988), the collateralization hypothesis of Benveniste and Berger (1986) and James (1988) and the signalling hypothesis of Greenbaum and Thakor (1987).

This research reports the results of tests which focus on bank issuance of standby letters of credit (hereafter SLCs). This relatively new financial product has grown in use dramatically in the

last fifteen years, so that now over half of all banks in the U.S. issue SLCs. SLCs allow banks to separate the funding function from other loan servicing functions. In an SLC backed loan, the bank underwrites the credit risk, and may perform other services to the borrower, but the funds are obtained directly from investors. This allows the bank to earn fee income without putting an asset (and corresponding liability) on its balance sheet which would be subject to capital adequacy guidelines and other regulatory taxes. The next two sections of this paper briefly describe hypotheses which attempt to explain the presence and growth of SLCs, as well as the empirical implications of each. Section 4 outlines several experiments we have conducted in order to test these implications. Section 5 presents the results and compares them to the theoretical predictions. Section 6 summarizes and concludes.

THEORIES OF BANK CHARACTERISTICS

Regulatory costs hypothesis

According to Baer and Pavel (1988), banks' increasing utilization of SLCs, loan sales, and other innovative securitized products is motivated by a desire to offset increasing regulatory costs. Specifically, they argue that banks began issuing these products in direct response to the attempts of regulators to increase banks' equity capital requirements, and that the amount of SLCs issued by a bank is determined by the extent to which these requirements imposed costs on that bank. Baer and Pavel present empirical results which support this conclusion. Baer and Pavel find that the volume of SLCs issued by a bank (relative to its assets) is negatively related to the market value of equity capital relative to its assets and the amount of required reserves. SLC volume is found to be positively related to asset size, the relative volume of commercial and industrial loans owned by the bank and the implicit regulatory tax on capital. This final variable is uniquely derived by Baer and Pavel and is supposed to measure the tax burden associated with holding the mandated amount of capital, and is a positive function of the amount of equity in the banks market value capital structure.

Baer and Pavel conclude that differences in the impact of regulatory taxes account for the differences in SLC volume among their sample of banks. However, their highly restricted sample gives rise to natural concerns as to the generality of the results. As they do not examine any banks which do not issue SLCs, they cannot explain the choice between issuance and non-issuance. Additionally, their sample size is only 33 banks, because of the need for market equity data to derive some of their independent variables. This sample necessarily comprises the largest banks, including the multinationals. If one believes that there are fundamental differences between the operations of these multinationals and the operations of community, regional, and even the super-regional banks, then it is difficult to generalize these results to the determinants of SLC issuance for the thousands of smaller banks which use these instruments.

Another serious concern with Baer and Pavel's results is that they focus on the changes in equity capital regulation that began in late 1981, and was extended to multinationals in 1983. They duly note that the period which followed was marked by dramatic growth in SLCs. They fail to mention, however, that the decade preceding this regulation was also one of growth in SLCs. SLCs first appeared in 1973 and in the eight years 1973-1981 SLC volume grew by an annual compound rate of 27.45%. By comparison, in the years 1981-1985 the growth rate was only 18.56% (see Table

1). Therefore, although the Baer and Pavel model exhibits excellent explanatory power within sample, it cannot be said to explain the introduction and growth of the SLCs overall or to explain the choice of banks whether or not to issue SLCs.

The collateralization hypothesis

This hypothesis, as explained by Benveniste and Berger (1986) suggests that banks that are very risky will shift their uninsured depositors to SLCs so that if the bank should fail the investor will still have a direct claim on the borrower. Although this may not at first sound like a very appealing argument, James (1988) explains that this is simply the natural extension of Myers' (1977) underinvestment problem to banks. That is, for any firm with risky debt outstanding, acceptance of positive NPV projects may reduce the riskiness of the debt and hence result in a transfer of wealth from stockholders to bondholders. For most firms, collateralized debt can mitigate the underinvestment problem. Banks, for the most part, are prohibited from issuing collateralized debt, and for them SLC's (and loan sales) may serve as a less than perfect substitute.

This theory contains two distinct empirical implications with respect to the characteristics of banks which issue SLCs. Both implications have relate to factors that increase the risk of the bank's debt. First, banks with less capital, *ceteris paribus* have more risky debt, hence SLC issuance and volume should be negatively related to equity capital ratios. Secondly, banks with more risky asset portfolios should issue relatively more SLCs. Thus there should be a positive relationship between the risk of a banks assets and the amount of SLCs issued. Benveniste and Berger (1986) find mixed support for the first implication. They use logistic regressions to determine the relationship between probability of SLC issuance and bank risk, where bank risk is measured by it's capital ratio and a dummy variable which is one when capital is judged adequate, zero otherwise. Based on their results, Benveniste and Berger conclude that banks with more leverage are more likely to issue SLCs. However, they also find that, among banks that issue SLCs, the volume of SLCs is negatively related to leverage. These two results seem to be contradictory. In this paper the Benveniste and Berger tests are replicated and their findings are essentially confirmed. However a more rigorous analysis of the data will suggest that the relationships are not economically significant. In addition, this paper presents the results of tests of the second implication.

THEORIES OF BORROWER CHARACTERISTICS

The collateralization hypothesis revisited

James (1988) uses a two-period model with future investment opportunities to model the aforementioned underinvestment problem for banks. He shows that, if the bank has risky debt outstanding, it may forego positive net present value investment opportunities if the gain from undertaking the opportunity will accrue primarily to existing debtholders (depositors). Securitization then provides for banks much the same benefits as does collateralized debt for non-regulated firms. This model implies that banks with debt that is relatively more risky will issue relatively more SLCs, as mentioned in the preceding section. However, James points out that this hypothesis also contains a testable implication about which borrowers are likely to be the purchasers of these SLCs. Because

the underinvestment problem is not likely to be serious for loans with very high NPV (high risk), SLCs are likely to be used for low-risk loans to high quality borrowers. That is, *ceteris paribus*, borrowers who borrow using SLCs should be of lower default risk than those who do not.

The signalling hypothesis

Greenbaum and Thakor (1987) have offered an explanation for securitization that is different from these other theories in an important respect. Their model is primarily focused on which borrowers might benefit from purchasing insurance from banks and borrowing directly from investors as opposed to borrowing from banks which investors deposit their funds in. This is an important distinction, as other theories have focused on the bank's choice of whether to make loans or issue SLCs.² Their model does not rely on any particular assumptions regarding the banking environment, but, in fact, shows that even in a world of *laissez faire* the use of SLCs offers greater contract design flexibility and a (potentially) less costly resolution of informational asymmetry, but at the cost of less efficient risk sharing.

Greenbaum and Thakor model the borrowers choice of whether to purchase insurance (an SLC) in a utility maximization framework where banks are risk neutral, borrowers are either risk neutral or risk averse, and investors (depositors) are risk averse. If there exists an asymmetry of information regarding the quality of the borrower, Greenbaum and Thakor show that an equilibrium exists where good quality borrowers signal their low risk by purchasing SLCs. They demonstrate that the equilibrium is incentive compatible and that there exists a fee schedule charged for the SLCs such that each borrower's utility maximizing choice of insurance coverage (from 0 to 100 percent) fully reveals to the bank and investors the quality (default risk) of the borrower. Thus, for a given borrower, the higher its credit rating, the more likely it should be to purchase an SLC. This implication is explicitly tested in procedures explained in the following section.

DATA AND METHODOLOGY

Tests of bank characteristics

The first set of experiments is designed to test whether there is an economically significant relationship between the amount of SLCs issued by a bank and observable characteristics of that bank. These tests provide information on the validity of both the regulatory costs hypothesis and the collateralization hypothesis. Data for these experiments are obtained from the Federal Financial Institutions Examination Council Consolidated Reports of Condition and Income for the years 2000, 2001 and 2002. These reports include information as to the amount of SLCs outstanding for each bank, although these are considered "off-balance sheet" items. Following the lead of Benveniste and Berger (1986, 1987) two dependent variables related to SLC issuance are examined. The variable LOGSLC is an indicator variable that is equal to one if the bank has any SLCs outstanding, zero otherwise.

This is regressed on the explanatory variables of interest and several control variables a series of logistic regressions. This permits a test of whether there are systematic differences between issuing and non-issuing banks. The second dependent variable of interest is SLCVOL, defined as

the amount of SLCs outstanding divided by the total assets of the bank. This variable is regressed on the explanatory variables in a series of ordinary least squares (OLS) regressions. These experiments examine the determinants of variation in SLC volume among those banks which issue SLCs. Thus only banks with SLCs outstanding (have a value of one for LOGSLC) are included in the OLS regressions.

Table 2 contains definitions of all of the variables used in the study and the correlation matrix of the variables used in the regressions. There are two independent variables of interest, XCAP and LNRESV. The first is used to measure the financial leverage of the bank. XCAP (excess capital), is computed as a bank's primary capital ratio minus the regulatory required minimum capital ratio. The regulatory minimum was 5 percent for all banks in 2000 (although only implicitly for the multinationals) and 5.5 percent for 2001 and 2002. The second independent variable of interest is LNRESV (loan loss reserves). This is an attempt to measure the riskiness of the banks' assets, or, equivalently, the quality of the banks' customers. Suppose that the quality of a banks customers may be measured by examining the quality of loans to those customers.

In addition to one of the two explanatory variables of interest, each regression includes several control variables; the natural logarithm of total assets (SIZE), operating costs as a percentage of total assets (OPCOSTS), and indicator variables which are none if the bank is owned by a multibank holding company (MBHC), has foreign deposits (FNDEP), or is based in a unit-banking state (UNIT), zero otherwise. Benveniste and Berger (1986) have established the theoretical and empirical necessity of including these control variables. The correlation matrix of the regression variables is given in Table 2.

Tests of borrower characteristics

The other tests performed in this study are concerned with characteristics of borrowers who purchase SLCs. Municipalities comprise a large portion of the entire market for SLCs, and they are the focus of this part of the study. The sample used here is selected randomly from among all municipalities. It consists of the first 1000 cities or countries in the 2000 Moody's Municipal and Government Manual which had general obligation debt rated by Moody's. This sample is also separated into two subsamples, comprised of the first and second 500 municipalities. For each municipality, two items are collected; the general obligation debt rating, and whether that municipality has purchased an SLC for any of its outstanding bonded debt. In order to determine whether a relationship existed between the credit risk of a borrower and the probability of purchasing SLCs logistic regression is employed. The bond rating of municipalities are converted to an ordinal variable according to the schedule in Table 6 (Aaa=7, Aal=6, Aa=5, etc.). This variable, RATING, is regressed on PURCHASE, which is an indicator variable which is one if the borrower purchases an SLC for any of its debt, zero otherwise. Descriptive statistics and frequency distributions for RATING are also presented for both the sample of SLC purchasers and the remaining non-purchasers. These allow for a conclusion as to whether there is a significant difference in the distribution of bond ratings for purchasers and non-purchasers as implied by the collateralization hypothesis and the signalling hypothesis.

RESULTS

Logistic regressions on bank data

Table 3 contains results from the logistic regressions performed on the bank balance sheet data. In the top panel are the results from the 2000 data. Neither XCAP nor LNRESV are statistically significant, failing to support the implications of either the regulatory costs or the collateralization hypothesis. In the middle and bottom panels, 2001 and 2002, XCAP has a significantly negative coefficient, indicating a positive relationship between financial leverage and SLC issuance, consistent with the collateralization hypothesis. In neither case is LNRESV significant, despite the argument made above that the collateralization hypothesis would imply a negative relationship between loan loss reserves and SLCs. Hence it may be concluded that there is some relationship between bank leverage and SLC issuance, but that it is not pervasive across all years of the sample, and measures associated with the asset risk of the bank (as measured by loan loss reserves, additions to loan loss reserves, charge-offs, or non-performing assets) are not related to SLC issuance.

Ordinary least squares regressions

Table 4 reports the results of our OLS regression analysis. These results confirm the Benveniste and Berger finding that leverage is negatively related to SLC volume among SLC issuers. The coefficient on XCAP is significantly positive in all years. This result appears to conflict with the results of the logistic regressions, where the effect of XCAP was found to be negative. In the regressions using LNRESV as the explanatory variable of interest, the coefficient is of unstable sign and is significant only in 2000. In stepwise regressions used to validate the selection of the control variables, SIZE had the most explanatory power, accounting for nearly all of the model r-squared.⁶ Other independent variables, including the variables of interest, added negligible explanatory power to the model. That is, including XCAP or LNRESV into the model did not provide any measurable increase in the adjusted r-squared of the model⁷ after the inclusion of SIZE. This caused concern as to whether the high significance levels for these coefficients are, at least in part, an artifact of the very large sample size (14,356 in 2001, for example). This concern was found to be quite valid in tests described in subsequent sections.

Multinationals

One interesting subset of banks is the multinationals. The results show that there are dramatic differences in the explanatory power of the model for this specialized sample of banks. These results are summarized in Table 5. The control variables MBHC and FNDEP are eliminated due to perfect collinearity with the intercept, that is, all of the multinationals are owned by multibank holding companies and have foreign deposits. It is evident that neither XCAP or LNRESV have any significant relationship with the relative volume of SLCs among multinationals. This is especially surprising when considering the Baer and Pavel (1986) results that, in their sample of 33 large, publicly traded banks, capital ratios were an important determinant of SLC volume. Like the Berger

and Benvensite (1986) tests, Baer and Pavel's regressions included two variables related to equity capital; in the case of Baer and Pavel the two are the equity capital ratio and the capital regulatory tax. Although both are increasing in the amount of equity capital, the former is found significantly negative and the latter significantly positive. The confounding problem of these two variables may explain, in part, their results. Based on the results of the tests on bank balance sheet data, it may be concluded that size is the most effective variable in discriminating between SLC issuers and non-issuers. Theories which make strong predictions as to the likely characteristics of SLC issuers, the collateralization or regulatory costs hypotheses, for example, are not supported by such a finding. A weak implication of both the collateralization and the signalling hypothesis, namely that banks with greater asset risk would tend to issue more SLCs, was completely unsupported by the data

Municipal SLC purchasers

The tests run on the municipal bond data are the most direct tests of the signalling hypothesis. As noted before, both the Greenbaum and Thakor (1987) model and the collateralization hypothesis as stated by James (1989) imply that higher quality (investment grade and above) borrowers which have lower default probability are more likely to purchase SLCs, although this is a direct implication of the signalling hypothesis and only an indirect implication of the collateralization hypothesis. These experiments test that precise notion. Table 6 presents the descriptive statistics for the general obligation bond ratings of 1000 municipalities, as well as for the two subsamples of size 500. It may be concluded from these measures of central tendency that the debt ratings of SLC purchasers differ on average from the debt ratings of the non-purchasers.

Table 7 presents results of the logistic regressions. In the entire sample and both subsamples, RATING is significantly positively related to the probability of purchasing an SLC. The r-squared is very low, as would be expected. It is not suggested by the theory that credit rating is the sole determinant of SLC purchases. There is also a problem of time, in that some of the SLCs may have been purchased when the municipality had a general obligation bond rating different from the one it had in 2000, and this may interfere with our attempt to measure this relationship. A further concern, given the low explanatory power of the model, is that the significance levels may be in part due to the large sample size, rather than an economically significant difference in means.

SUMMARY AND CONCLUSION

This paper presents new empirical evidence regarding SLC volume and issuance by commercial banks, as well as evidence regarding the credit ratings of municipalities, one of the largest markets for SLC purchases. We have considered carefully the empirical implications of several theories set forth to explain the dramatic increase in SLC issuance. We find that, contrary to earlier conclusions, support for the regulatory costs hypothesis and the collateralization theory, its predictions with regards to which types of banks issue more SLCs were not confirmed.

On the other hand, predictions of the collateralization theory with respect to differences among purchasers were found to be supported. Borrowers who choose to purchase SLCs were found to be significantly higher in quality than those who did not. This is also support for the Greenbaum and Thakor (1988) signalling hypotheses, which makes the same prediction based on a very different

approach. The key result of this paper is to illustrate that theories which purport to explain the recent trend towards securitization should examine the incentives for borrowers to securitize rather than obtaining debt funding in a more traditional manner.

REFERENCES

- Baer, Herbert L., and Pavel, Christine A. (1988). Does regulation drive innovation? Economic Perspectives, March/April, 3-15.
- Benveniste, Lawrence M. and Berger, Allen, N. (1986). An empirical analysis of standby letters of credit. Proceedings of Bank Structure and Competition conference, Federal Reserve Bank of Chicago, 387-412.
- Benveniste, Lawrence M. and Berger, Allen, N. (1987). Securitization with recourse: An instrument that offers uninsured bank depositors sequential claims. Journal of Banking and Finance, 11, 403-424.
- Federal Financial Institutions Examination Council, Consolidated Reports of Condition and Income, 1984-1986.
- Gilbert, R. Alton, Stone, Courtenay C., and Trebing, Michael E. (1985). The new bank capital adequacy standards. Federal Reserve of St. Louis Review, v67 n5, 12-20.
- Greenbaum, Stuart I., and Thakor, Anjan V. (1987). Bank funding modes: Securitization versus deposits. Journal of Banking and Finance, 11, 379-401.
- James, Christopher (1989). Off-balance sheet activities and the underinvestment problem in banking. Journal of Accounting, Auditing and Finance, 111-124.
- Kareken, John H. (1987). The emergence and regulation of contingent commitment banking. Journal of Banking and Finance, 11, 359-377.
- Moody's Municipal and Government Manual (1990). Moody's, New York.
- Myers, Stewart (1977) Determinants of corporate borrowing. Journal of Financial Economics, 5, 147-175. Pavel, Christine (1986). Securitization. Economic Perspectives, July/August, 16-31.
- Pavel, Christine and Phillis, David (1987). Why commercial banks sell loans: An empirical analysis. Economic Perspectives, May/June, 3-14.

Authors' Index

Bexley, J.	1
Brown, D.J.	1
Evans, S.T.	3
James, J.F.	1
Kamery, R.H.	9, 15
Ngassam, C.	21
Pitts, S.T.	9, 15
Seay, S.S.	9, 15