Factors Influencing a Firm's Adoption of New Reporting Requirements: SFAS 122 and Mortgage Servicers

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ABSTRACT

This paper examines commercial banks' reporting of mortgage servicing assets (MSAs) during the period surrounding the issuance of SFAS 122, "Accounting for Mortgage Servicing Rights." Although the statement mandated reporting of originated mortgage servicing assets, which are created when mortgages are originated and later sold, we find that most affected bank servicers did not begin to do so. Banks may have avoided booking mortgage servicing assets because they are particularly volatile and are expensive to periodically value and test for impairment (another SFAS 122 requirement) Not reporting these assets is likely an acceptable practice on the grounds of their immateriality: they make up only a small part of most banks' asset base and earnings. Using call report data which identifies the size of the servicing portfolio whether mortgage servicing assets are booked or not, we analyze the factors that influenced bank servicers' decisions to begin reporting mortgage servicing assets on the balance sheet. We find that the size of the servicing portfolio and its growth rate were positively related to the reporting decision, while the size of the bank and its demonstrated ability to hold related securities (interest rate derivatives) were not. Results are mixed on the impact of the materiality (size) of the portfolio relative to total assets and earnings, as well as on a proxy for the banks' willingness to engage in other fee-based activities.

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1. Introduction

From time to time, the Financial Accounting Standards Board (FASB) develops new or revised reporting requirements for the assets that firms own. As these new statements are issued, it is important to analyze their impact on the affected firms, so that any future standards will better reach their stated goals without unanticipated side effects. A number of papers have analyzed factors affecting the timing of a firm's adoption and the economic impact on the firm (see, e.g., Amir and Livnat (1997), Amir and Ziv (1997), Sami and Welsh (1992), and Tung and Weygandt (1994)). Others have examined the extent to which the new requirements succeed in improving the quality of publicly available information (see, e.g., Aly, et al (1992), Olsen (1985), Rezaee, et al (1993), and Ziebart and Kim (1987)). The purpose of this paper is to determine the factors that influence a firm's decision to adopt Statement of Financial Accounting Standards (SFAS) 122 and begin to book mortgage servicing assets, which are generally a small percentage of a firms' assets. We are able to detect this particular asset, whether firms report it on the balance sheet or not, because a large subset of affected firms are required to disclose it to federal banking regulators.

When it was issued in May 1995, SFAS 122, "Accounting for Mortgage Servicing Rights: An Amendment of FASB Statement No. 65," added a significant reporting requirement for mortgage servicers. The statement required "that a mortgage banking enterprise recognize as separate assets rights to service mortgage loans for others, *however those servicing rights are acquired*." [SFAS 122, summary, emphasis added]. Under the prior statement, SFAS 65, when an institution originated a mortgage and subsequently sold or securitized it while retaining the servicing rights (the right to collect a fee for processing

the borrower's payments, pursue any delinquencies, and provide customer service), the value of servicing was not recognized on the balance sheet. However, if an institution purchased servicing rights from another originator or servicer, the purchase cost was recognized on the balance sheet as a mortgage servicing asset (MSA). The MSA was amortized and was tested periodically for impairment.[1] SFAS 122 was designed to do away with this disparate treatment of virtually identical assets.

In this paper, we examine the impact that SFAS 122 had on the booking of MSAs at a subset of mortgage servicing operations: those of U.S. commercial banks. We selected commercial bank servicers for study because, since the mid 1980s, they have been required to report the total principal balance of all residential mortgages serviced for others on the mandatory Reports of Income and Condition (commonly referred to as the call reports) that they file quarterly with federal regulators. This call report information, which conforms to GAAP but adds some additional reporting requirements, allows us to identify banks that were servicing mortgages without booking servicing assets before SFAS 122 was issued and to examine the reporting of MSAs by those institutions in the years following. In short, our research takes advantage of the unusual opportunity to examine the behavior of a large number of firms that are known to hold a specific asset following the adoption of a statement requiring them to report the asset's value. Prior research has implicitly assumed that firms' balance sheets fully reflect the value of particular assets following the adoption of new reporting requirements (see, e.g., Benjamin, et al (1986), Gopalakrishnan and Sugrue

[1]Actually, mortgage servicing was booked as a mortgage servicing right (MSR) under SFAS 122, which was surprisingly short-lived. It was superseded by SFAS 125, "Accounting for Transfers and Servicing of Financial Assets and Extinguishments of Liabilities" in June 1996. Among other things, SFAS 125 retained the reporting requirements for mortgage servicing that were introduced in SFAS 122, while extending them to servicing of other assets. However, under SFAS 125, mortgage servicing is booked as a mortgage servicing asset (MSA), the name we use in this paper.

(1992), and Khurana (1991).) In contrast, we examine a case in which the majority of firms *did not* begin to book the value of certain assets following a new reporting requirement.

Banks had reasons to avoid booking MSAs because MSAs are particularly volatile (highly sensitive to changes in interest rates) and because SFAS 122 mandated periodic valuation and impairment testing of the portfolio, which might entail substantial expenditures for technology and personnel. For many banks, MSAs are only a small fraction of total assets or earnings; therefore, such banks could decline to report MSAs on the grounds of their immateriality. In our empirical investigation, we find that the decision to begin reporting MSAs during the two years following the adoption of SFAS 122 was positively related to the size of the servicing portfolio as well as its rate of growth. The decision was not related to the size of the firm. Two measures of the materiality of a servicing portfolio (relative to a firm's size and to income level) had mixed impacts on the reporting decision, as did the propensity of the firm to engage in other nontraditional, fee-based activities. Finally, although MSAs are subject to high levels of interest rate risk, firms that were willing and able to hold securities that were highly sensitive to interest rate risk were no more likely to report MSAs than those that were not.

The remainder of this paper is structured as follows. In section 2, we review the existing literature on reporting decisions and related topics. In section 3, we describe mortgage servicing assets and their particular risks and develop the specific hypotheses that we test. In section 4 we describe the call report data that we use and provide some summary statistics. In section 5 we describe and discuss our results. The final section is a brief conclusion.

2. New Standards and Reporting Decisions.

Each time that FASB issues a statement that adds to or revises reporting requirements, questions are raised about its ultimate impact on affected firms or industries and the reaction of the investing public for whom financial statements are ultimately intended (see, e.g., McDonald and Morris (1984) and Mittelstaedt, et al (1995)). These questions are worth answering because the information provided should improve FASB's future efforts and help firms and their stakeholders to better predict the results of ongoing changes in accounting standards. Previous studies have examined a number of issues surrounding the release of new standards, including the ability of the standard to elicit the intended disclosures (Haw and Lustgarten (1988)), the economic impact on affected firms (e.g., Garsombke and Allen (1983)), and the extent and timing of a firm's compliance (e.g., El-Gazzar and Jaggi (1997)).

While a primary goal of all new reporting requirements is to improve the quality or timeliness of information that is released to the public, the empirical evidence on this question is mixed. McAnally (1996) examined off-balance sheet disclosures required under SFAS 105 and found that the information in these disclosures, when added to previously available balance sheet information, was able to explain more of the observed variation in market-level and industry-level systematic risk (beta) across firms. The improvement in explanatory power, however, was relatively small. Wiedman and Wier (1999) found that SFAS 94, which mandated balance sheet consolidation requirements for subsidiaries, not only provided more information than previous, note-based disclosures, but the market's reaction to the disclosures also suggests that the information provided was previously unavailable to investors.

There is also disagreement at times about the impact of a particular statement. For example, Nelson (1996) found that SFAS 107-mandated disclosures of the fair value of loans were of no incremental benefit in explaining a firm's market value. Yet, in a similar paper, Barth, et al (1996) found that the newly available information, when properly conditioned, did in fact help to explain the market value of the institution.

Studies of economic impact examine the market's reaction, the firm's reaction, or both. A stock price's reaction to a change in accounting standards has often been found to vary considerably across industries and firms. For example, in one of a number of studies on the impact of SFAS 106, "Employers' Accounting for Postretirement Benefits Other than Pensions," Espanbodi, et al (1991) found that the statement had a negative effect on the equity prices of a broad cross-section of firms. In contrast, for rate-regulated public utilities, Khurana and Loudder (1994) found no price impact.

Some studies of economic impact examine a firm's decision to change its business activity in response to new reporting requirements. For example, Mittelstaedt, et al (1995) found that increased contracting costs related to SFAS 106 contributed to firms' decisions to reduce retiree benefits. Another example is Godwin, et al's (1998) study of property-casualty insurers' classification of investment assets into trading, available-for-sale, and held-to-maturity portfolios, as required under SFAS 115. Trading or available-for-sale classification requires fair value accounting, implying greater liquidity but higher income statement and balance sheet volatility; held-to-maturity classification requires historical cost accounting. The authors provide evidence that classification decisions were motivated by firms' tradeoffs between liquidity risk and concerns about accounting volatility.

Also of great interest is how quickly and how thoroughly firms with certain characteristics adopt new reporting requirements. A common motive for delayed adoption is to avoid weakening financial performance measures. El-Gazzar and Jaggi (1997) found that late adopters of SFAS 13 were motivated to avoid changes in various leverage ratios lest they increase the risk of being in technical default of GAAP-based debt covenants. Amir and Livnat (1996) and Amir and Ziv (1997) found that the timing of SFAS 106 adoption by firms was significantly related to the size of their undisclosed postretirement benefit obligation. These studies also found that the timing of adoption appeared to be related to earnings management.

Our paper is most related to the latter branch of the literature, in that we examine the impact of a firm's characteristics on MSA reporting following the adoption of SFAS 122. However, unlike these papers, we concentrate more on banks' decisions *whether* to begin reporting the value of their mortgage servicing rather than *when* to begin.

3. Mortgage Servicing.

A mortgage servicing asset (MSA) embodies the contractual right of a servicer to receive a stream of fees that are typically equal to a percentage of the outstanding principal balance of the mortgage plus any late payment fees and interest earnings on payment float or escrow. In return, the servicer provides a number of services including collecting and processing borrower payments, pursuing delinquent payments in a timely manner, providing information to borrowers, and managing foreclosure (when necessary). An

MSA is a tradable quasi-financial asset.[2] Any mortgage, or other loan, has a potential servicing asset which can be stripped and sold separately from the financial asset. Only in the case of single-family residential mortgages, however, has a large ongoing, liquid market for MSAs developed to date. Some mortgage originators hold their loans in portfolio and service them in-house; thus, the issue of a separate servicing asset does not arise. Others sell mortgages they originate but retain the right to service those mortgages for the new investors. (Such mortgages are said to be sold "servicing retained.") Still others sell their originations bundled together with the right to service them. (Such mortgages are sold "servicing released.")

From September 1982 until May 1995, SFAS 65, "Accounting for Certain Mortgage Banking Activities," governed the accounting treatment of MSAs. According to SFAS 65, an MSA was treated in one of two ways, depending on how the servicer came to own it. If the servicer originated the mortgage associated with the MSA, it was left off the balance sheet regardless of whether the mortgage asset was retained in portfolio, securitized, or sold to investors. If the servicer purchased the MSA, with or without its associated mortgage asset, then a balance sheet asset was created with a book value equal to the purchase price.[3] Over the life of the mortgage, a purchased MSA's value was amortized away against the servicing income earned. In summary, under SFAS 65, two MSAs owned by the same servicer and with

[2]We refer to MSAs as "quasi-financial" assets because the income stream from servicing fees has the structure of a financial derivative asset (e.g., a mortgage-backed interest-only strip security), but is earned only when the act of servicing is performed. In contrast, investment in a standard financial asset (e.g., a bond) is passive, requiring no ongoing activity.

[3]In the pre-SFAS 122 vocabulary there were two types of servicing rights: originated mortgage servicing rights, or OMSRs, and purchased mortgage servicing rights, or PMSRs.

otherwise identical characteristics were treated differently based on who originated the associated mortgage.

This disparity in accounting treatment created two significant problems. First, as the mortgage banking industry became more competitive throughout the 1980s and profit margins thinned, many originators who sold mortgage assets and retained servicing began reporting losses on these sales. They did so because the costs reported for mortgage origination were incurred in the process of producing both a mortgage asset and an MSA, but the income reported represented only the sale of the mortgage asset. The institution expected to earn back this loss, and eventually to book a profit, as net servicing income was received over the life of the mortgage. Second, some servicers sold originated MSAs to offset or reverse declines in reported income. Essentially, when faced with a decline in income, whether from a loss in the value of purchased MSAs or from any other source, a servicer could sell an MSA with a cost basis of zero and book the entire sales price as profit. Servicers made these sales regardless of the underlying economic gain or loss associated with the sale. Indeed, in some cases, servicers simply "churned" their books — selling originated MSAs with a zero cost basis to book the profit and purchasing MSAs from others to maintain efficient servicing volumes. Issued in May 1995, SFAS 122 was designed to solve these problems by requiring that all MSAs be recognized on the balance sheet, amortized against income, and tested periodically for impairments.[4]

[4]Pfeiffer (1998), provides evidence that, under SFAS 65, some independent mortgage banks used originated servicing to manage earnings. He also provides evidence that, despite being off-balance sheet, originated servicing was, to some extent, priced by external investors.

The value of an MSA is, in simplest form, the sum of the present values of income, defined as servicing fees, late payment fees, and other income expected to be earned, less the expected costs of providing the required services. The value of an MSA depends on a number of factors. Contractually, it will depend on the defined servicing fees, the principal balance of the mortgage, the mortgage's stated maturity; and it will depend on the servicer's ability to collect additional fees, sell related products, or earn float while holding borrower funds, as well as the servicer's obligations in the event of a default. The value will also depend on the discount rate used to value an MSA's expected net cash flows, which combines the market level of interest rates and a risk premium associated with mortgage servicing.[5]

But MSAs are not simple fixed-income assets whose values are inversely related to the level of interest rates. MSAs are extremely vulnerable to borrower prepayments. When a mortgage is repaid prior to its scheduled maturity date, the associated MSA loses all of its value immediately because there is no longer a loan to service. The rate or speed of prepayment in a mortgage portfolio is strongly and inversely related to changes in the level of interest rates — i.e., falling rates imply rising prepayment speeds and vice versa. The speed also depends on the characteristics of individual borrowers and general economic conditions.[6] Because of prepayments, MSA values are typically *positively* related to changes in the level

[5]MSA valuation models employed by large servicers today are still based on discounted cash flows. However, they are quite complex, including very detailed breakdowns of servicing income, expenses, timing of payments, etc.; they also incorporate option adjusted spread (OAS) and Monte Carlo simulation techniques and stochastic elements such as prepayment functions. However, for the purpose of understanding the risks of MSAs and for the purpose of this paper, the simplified discounted cash flow approach described in the text is sufficient.

[6]There have been two massive waves of refinance activity in the 1990s (1993 and 1998), as homeowners responded to falling interest rates and to the ease and low cost of refinancing brought about by intense competition in the mortgage market.

of interest rates. When interest rates decline, the added value that results from a lower discount rate is overwhelmed by the reduction in expected cash flows because of increased borrower prepayments.[7]

SFAS 122 required a large number of mortgage servicers to begin recognizing very risky assets on the balance sheet, either for the first time (if the institution's servicing was all originated in-house) or in greater volume. The statement and its June 1996 successor, SFAS 125, also required that servicers determine the fair market value of their servicing portfolio each quarter for purposes of impairment testing.[8] To meet this requirement, institutions that had not previously booked MSAs needed to develop or purchase sophisticated (and costly) valuation models and hire or train the staff necessary to run them. Institutions that already had PMSRs on the books had to refine their valuation techniques to meet the more stringent requirements of SFAS 122. In addition, because MSAs are highly sensitive to changes in market interest rates, the requirement to begin recognizing them might also induce servicers to actively hedge the interest rate risk embodied in the newly recognized asset.

Faced with SFAS 122's reporting requirements, a mortgage servicer that had not previously booked MSAs could have one of three responses:

1. Begin to sell all newly originated servicing.

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[7]In this way, MSAs have an interest rate sensitivity that is very similar to that of mortgage-backed interest-only (IO) strip securities.

[8]If the fair market value of the servicing portfolio falls below its amortized book value, the servicer must recognize an impairment which reduces the book value of servicing, adversely affects net income for the period, and must be separately disclosed in the footnotes of financial statements. SFAS 122 also imposed relatively detailed and stringent requirements for measuring fair market value.

2. Continue to retain newly originated servicing, but recognize its value by beginning to book MSAs.

3. Continue to retain newly originated servicing without booking MSAs, presumably because the value of the servicing portfolio is deemed immaterial from an accounting perspective.

For institutions that had not previously reported MSAs, the decision to begin reporting them (or not) was a complex one that likely weighed conflicting objectives. Although banks wanted to comply with the new accounting standard, they also wanted to avoid adding risky assets to the balance sheet, as well as the costly reporting and potential risk management requirements that came with them.[9]

We are unable to provide much evidence on the first of the three options, other than to examine trends in the number of institutions that experienced declines in the volume of mortgages serviced for others and trends in banks entering and exiting the mortgage servicing industry. However, regarding institutions that continued to retain originated servicing, we present a number of hypotheses about what might influence their decision to begin reporting MSAs or not. The testing of these hypotheses is the central empirical question addressed in this paper.

Hypothesis 1: Larger institutions are more likely to begin reporting MSAs. A larger institution generally engages in a broader range of activities. Through economies of scale and scope, it is more likely to have the information systems, valuation models, and technical expertise needed to comply with MSA reporting requirements and to conduct any necessary risk management activities. Therefore, the costs of beginning to report MSAs on the balance sheet should be lower for large banks.

[9]For a nontechnical summary of the impact of SFAS 122 on mortgage servicers, see Gilkeson and Stengel (1999).

Hypothesis 2: Institutions with larger or faster-growing servicing portfolios are more likely to begin reporting MSAs. An institution that is a bigger player in the industry or one that is increasing its presence through growth is more likely to have invested in the information systems, valuation models, and technical expertise needed to comply with MSA reporting requirements and to conduct the necessary risk management activities. In addition, as its stature in the industry grows, so too should the scrutiny of any failure to report MSAs on the balance sheet.

Hypothesis 3: Institutions for which mortgage servicing is a larger (more material) part of their operations are more likely to begin reporting MSAs. Materiality standards allow some latitude in reporting decisions, but the larger an institution's servicing activity relative to its size or earnings, the more difficult it should be to justify not reporting MSAs to internal or external auditors, shareholders, and analysts.[10]

Hypothesis 4: Institutions that also engage in relatively large amounts of nontraditional activities are more likely to begin reporting MSAs. If an institution has already signaled its participation in nontraditional activities (i.e., those that are substantially different from the traditional banking activities of deposit taking and loan making), it should be more willing to recognize its servicing on the balance sheet. Many of these activities are fee-based and thus add risks that may be similar to those of mortgage servicing.

[10]There are no fixed rules for determining materiality. Statement of Financial Accounting Concepts (SFAC) No. 2 finds materiality when "the magnitude of omission...makes it probable that the judgement of a reasonable person relying on the information would have been changed or influenced..." Arens and Loebbecke (1997) provide an illustrative materiality guideline which notes that cumulative misstatements exceeding 5-10 percent of operating income before taxes or 3-6 percent of total assets should be considered material.

A firm's stakeholders have already accepted such activities and their attendant risks.

Hypothesis 5: Institutions that already use derivatives to manage interest rate risk are more likely to begin reporting MSAs. The systems and staff necessary to actively hedge against interest rate risk using derivatives are costly. An institution that already has such a system and staff in place should face less of a hurdle in recognizing and managing the risks of MSAs.

4. Servicer Data.

Aside from a few industry-wide totals published by *Inside Mortgage Finance*, the data employed in this paper are drawn from the mandatory Reports of Income and Condition (call reports) filed quarterly with federal regulators by all commercial banks. Banks are required by law to provide accurate and timely information on the call report and face significant fines and penalties if they fail to do so. In recent years, the federal regulatory agencies have adopted GAAP as the reporting basis for balance sheet, income statement, and related schedules in the call report, eliminating most of the differences between regulatory accounting principles and GAAP that had existed in earlier years. Some differences still exist, most notably with regard to regulatory capital standards. There are also differences in reporting detail, such as the call report items for the principal balances of mortgage serviced for others, which are used extensively in this paper, but which are not recognized (required) for general-purpose financial statements under GAAP.[11]

[11]For a fuller discussion of GAAP, regulatory accounting principles, and the elimination of the differences between them, see FFIEC, "Revisions to the Reports of Condition and Income (call reports) for 1997," FIL-109-96, December 31, 1996.

Our initial data set consisted of 1,917 banks meeting the following criteria: (i) insured institutions with assets greater than zero; (ii) institutions reporting under the same charter number during each of the years studied; and (iii) institutions reporting mortgages serviced for others or MSAs in any one of the years studied. We selected a five-year period, 1993-1997, in order to give a baseline predating the implementation of SFAS 122.[12]

While the call report data are for only the commercial bank and bank subsidiary sectors of the mortgage banking industry, these firms control a substantial, representative, and growing market share. Using *Inside Mortgage Finance*'s estimates of total outstanding U.S. one- to four-family mortgage debt and call report data for total commercial bank whole mortgage loan and servicing portfolios, we estimate that commercial banking's share of the entire servicing market grew from 30.5 percent at year-end 1993 to 38.7 percent at year-end 1997. In addition, the commercial bank sector covers the range from community banks that service small, self-originated mortgage portfolios to such industry giants as Chase Manhattan, Nationsbanc, and Fleet mortgage companies, whose servicing portfolios topped $100 billion in the period under review. Thus, given the market share and diverse makeup, we believe that the behavior and decisions of commercial bank servicers can be viewed as representative of the servicing industry.[13]

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[12]FASB allowed retroactive adoption of SFAS 122 as early as January 1, 1995, and mandated adoption for fiscal years beginning after December 15, 1995.

[13] While there are regulatory data -- from the TFR and Y-9 reports -- for mortgage servicers owned by thrifts and bank holding companies, respectively, those data and the call reports are difficult to compare, precluding the data's inclusion in our study. Finally, the little data available on the unregulated sector, made up of independent mortgage banking firms, is far inferior to the call reports in scope, accuracy, and consistency.

Although it is the call report's inclusion of the balance of mortgages serviced for others that makes our examination possible, the data are not ideal for our purposes. In terms of useful variables, there is no coverage, for example, of the volume of mortgage originations or of loans purchased or sold. Despite those limitations, the material that follows demonstrates that it is nonetheless possible to draw meaningful inferences about the impact of SFAS 122 from that data.

The information that we collected for each bank includes year-end totals for assets, mortgages held in portfolio, mortgages serviced for others, MSAs, and interest rate derivatives not in the trading account. In addition, we collected data on pre-tax earnings and earnings from nontraditional sources such as fee income (other than from deposit accounts), trading income, and realized gains and losses in securities portfolios.

Table 1 is an overview of this paper's mortgage-servicer dataset. During the period under investigation, the number of banks reporting servicing for others increased gradually, both in numbers and as a proportion of the banking industry. Nevertheless, the number remained less than 20 percent at year-end 1997. An even smaller portion of the bank population reported MSAs on their balance sheets: less than 2 percent in the years prior to the adoption of SFAS 122 and about 5 percent or so in the two years following. Those reporting servicing for others were considerably larger in assets than the average for all banks, and those reporting MSAs were several times larger still. The average volume of reported MSAs doubled over the period to about $18 million.

It is clear from table 1 that many bank servicers began to report MSAs in the years following SFAS 122 adoption, a direct and expected result of the new reporting requirement. The number of banks reporting MSAs more than doubled in 1996, the first year following mandatory implementation, and increased an additional 24 percent the next year. However, a surprising and unexpected observation is the large number of banks that continued to service mortgages *without* reporting any servicing assets. While the proportion of servicers reporting MSAs increased throughout the period, and most rapidly in the years following SFAS 122, it barely exceeded one-third in 1997. The investigation of this unexpected finding is the focus of the empirical analysis that follows.

Banks' declining to report could be explained in a number of ways, the simplest being that many banks may have decided to cease servicing operations because of SFAS 122. That is, they might have declined to add new servicing assets and made it policy to liquidate their existing servicing portfolios through scheduled amortization and prepayments. However, the evidence in table 2 is contrary to this argument, at least for a substantial number of the nonreporting banks. The table lists the number of banks with mortgages serviced for others but no reported MSAs for each year, the number of nonreporting banks for which the servicing portfolio grew, and the number of non-reporting banks among new servicers. Clearly, if a bank's servicing portfolio grew from one year to the next, new servicing assets had to have been added to overcome amortization and prepayments in the underlying loan portfolio. Indeed, given typical mortgage prepayment rates of between 10 percent and 20 percent per year during this period, one could properly assume that servicing portfolios with only moderate declines (under 10 percent) added new servicing during the year. The fact that a number of banks reported servicing for the first time but did not

report MSAs suggests that banks viewed SFAS 122's reporting requirement as an option rather than as a mandate.[14]

At first, declining to report MSAs may not seem to be a "choice" that banks can make, since SFAS 122 requires the valuation and booking of the asset. The materiality of the MSAs, however, is the key to this paradox. In table 3, we estimate the value of MSAs that could have been booked by banks in our sample that experienced growth in their servicing portfolios between 1996 and 1997 but did not report MSAs at year-end 1997. The table demonstrates that the servicing assets that could have been booked were generally very small relative to the asset size and earnings of the nonreporting banks.

Using the estimates in table 3 based on the growth of the servicing portfolio, MSAs would have exceeded 1 percent of assets for only 0.4 percent of the nonreporting banks.[15] The mean value for those banks was 0.03 percent of assets, and the median was 0.01 percent. Estimated MSAs exceeded an amount equal to 5 percent of earnings for only 7.3 percent of the nonreporting banks. The mean for those banks was 2.0 percent of earnings and the median was 0.8 percent.

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[14]There are four possible explanations for a servicer to decline to report MSAs while adding to its servicing portfolio in the post-SFAS 122 period: accounting or reporting error, evasion of the requirement (fraud), subservicing of the portfolio, and a determination of immateriality. Given the large numbers of nonreporting banks that we find, the extent to which the new standard was covered in the trade press, and the nature and frequency of bank examinations, we believe it unlikely that error or fraud is a primary explanation. If the servicing portfolio is contracted to another servicer (subservicing) SFAS 122 still requires that an MSA be booked, although it has been suggested to us that some may not be aware of this requirement.

[15]A substantial portion of the servicing portfolios at these banks in 1997 were likely mortgages that were originated prior to SFAS 122, and MSAs would not have been booked. Therefore, the "MSA Growth" estimates in table 3 represent a better measure of the assets that could have been booked than the "MSAs," which are based on the entire servicing portfolio.

In addition, it appears from all measures in table 3 that the materiality of the MSAs, relative to assets and income, differs sharply between reporting and nonreporting banks. This lack of materiality may have been the basis for the decision by such a large number of banks not to report MSAs on the balance sheet.

Table 4 provides additional information about servicers whose portfolios grew or shrank during the period studied. While servicers with growing portfolios were much more likely to report MSAs, by year-end 1997 less than half did so, while almost 20 percent of servicers with declining portfolios reported MSAs. Table 4 also provides the number of banks that entered and exited the mortgage-servicing industry each year, defined, respectively, as those reporting mortgages serviced for others for the first time and those that had previously reported mortgages serviced for others but reported none at the end of the year. The larger number of entrants, coupled with the stability of the number exiting, suggests that SFAS 122 did not by itself drive servicers out of the industry or preclude new entry.[16] Of course, the increase in the number of banks with declining servicing portfolios may mean that some banks responded to SFAS 122's implementation by adopting a "slow exit" strategy.

5. Empirical Tests and Results.

In order to focus attention on the decision of whether to report MSAs or not in the post-SFAS 122 years, we examined the 1,442 commercial bank servicers that reported mortgages serviced for others in

[16]These findings conflict with some rather dire predictions in the mortgage banking press that SFAS 122 would make it difficult for small and mid-sized servicers to compete, leading to greater consolidation in the industry (see, e.g., Gerlach (1996), La Monica (1996), Oliver and Kogler (1996), Ryan (1995),or Staples (1996)).

1996 but had not reported MSAs in 1995. Of these, 268 reported MSAs in 1996. These tests were repeated for the 1,219 banks with servicing in 1997 but no reported MSAs in 1996. Of this sample, 120 reported MSAs in 1997. It is important to recognize that the 1997 sample does not include any of the 268 banks that first reported MSAs in 1996. Because of this, the factors influencing MSA reporting may change from 1996 to 1997.

In order to test our various hypotheses, we employed a logit regression model to estimate the following equation:

$$ln(p/(1-p)) = \alpha + \beta_1 \cdot ln(ta) + \beta_2 \cdot ln(mso) + \beta_3 \cdot msog + \beta_4 \cdot amat + \beta_5 \cdot emat + \beta_6 \cdot ndum + \beta_7 \cdot ddum + \varepsilon \quad (1)$$

where *p* is the estimated probability, ranging from 0 to 1, that a particular bank began to report MSAs in the year under consideration. Logistic regression is a common estimation technique in cases of qualitative, or dichotomous, dependent variables such as this; that is, the observed dependent variable can take on only two values, 1 if the bank began to report MSAs on the balance sheet during the year and 0 if it did not. The logit technique models the log of the odds ratio, *p/(1-p),* as a linear function of a set of independent explanatory variables.

The independent variables are

- *ln(ta),* the natural log of year-end total assets. As a measure of bank size, this variable tests

hypothesis #1.

- *ln(mso)*, the natural log of the total principal balance of mortgages serviced for others. As a measure of the size of the servicing portfolio, this variable tests hypothesis #2.

- *msog*, the growth rate of the servicing portfolio, measured as the percentage change in the total principal balance from the previous year. This variable also tests hypothesis #2.

- *amat*, the principal balance of mortgages serviced for others divided by total assets. As a measure of the materiality of servicing, this variable tests hypothesis #3.

- *emat*, the imputed value of mortgage servicing asset that could potentially have been booked by banks experiencing growth in their servicing portfolio. The imputation is carried out by taking 100 basis points (1%) of the increase in the servicing portfolio over the previous year, divided by pre-tax earnings for the year.[17] This second materiality measure also tests hypothesis #3.

- *ndum*, a dummy variable equal to one if the proportion of the bank's earnings before taxes that comes from non-traditional sources (fee income excluding service charges on deposit accounts, trading income, and realized gains on securities) is greater than the median for all banks in our sample. As a measure of the bank's and its stakeholders' comfort with operations similar in form and risk to servicing, this variable tests hypothesis #4.

- *ddum*, a dummy variable equal to one if the bank holds interest rate derivatives in a non-trading account. As a measure of the bank's ability to measure and manage interest rate risk through the use of derivatives, this variable tests hypothesis #5.

- ε, the error term.

For hypotheses #1 and #2, the choice of proxy variables was obvious. Because definitions of materiality can vary, we employ two variables to test hypothesis #3, one measuring the size of the portfolio relative to total assets and the other measuring the estimated MSA value from growth in the servicing portfolio relative to earnings. For hypothesis #4, a variety of measures of non-traditional income could be

[17]This valuation level is typical for new servicing capitalized or sold in recent years. Valuations as high as 150 bps were also tried, with essentially the same results.

employed. The results we present were robust to a number of alternatives.[18] Finally, for hypothesis #5, we consider the presence of nontrading interest rate derivatives on the balance sheet to be a proxy for the bank's ability to measure and manage the risks of servicing assets, because the servicing assets are highly sensitive to interest rate risk and the derivatives are a sophisticated way of managing such risk.

Table 5 presents the results of our tests. Both goodness-of-fit measures, R^2 and percent correct predictions, are satisfactory for cross-sectional analysis. With regard to the estimated coefficients, we find that a bank's size did not affect its decision to begin reporting MSAs; thus, hypothesis #1 is not supported by the data. The cause may be conflicting impacts: larger banks are more able to handle MSA reporting and management requirements, but, all else the same, servicing will be a smaller portion of their portfolio. The size of the servicing portfolio and its rate of growth both have a significant, positive impact on the decision to report MSAs, thus supporting hypothesis #2. Banks with larger or growing servicing operations are more likely to reflect their servicing operations on the balance sheet.

Surprisingly, the size of the servicing portfolio relative to the size of the bank (a measure of the materiality of the servicing operation) has no impact on MSA reporting decisions. Further, the size of the servicing operation relative to earnings has a significant (positive) impact only during the second year of SFAS 122 adoption, although the significance of the coefficient during the first year is only a bit above

[18]In addition to the measure of nontraditional income presented in our results, we examined the impact of fee income (excluding service charges on deposit accounts) over total income, fee income plus trading income over total income, and fee income plus trading income plus realized gains on securities over earnings before extraordinary items and taxes.

traditional cutoff levels. All told, the support for hypothesis #3 is weak and inconsistent.[19]

High reliance on nontraditional income sources has a significant and positive impact on the reporting decision for the first-year cohort of banks, but not the second-year group. Support for hypothesis #4 is therefore mixed. Finally, the bank's decision to report MSAs is unrelated to whether it already held interest rate derivatives. Thus, hypothesis #5 is not supported.[20]

It also does not appear that the decision (or requirement) to begin reporting MSAs caused banks to have to hedge the resulting interest rate risk exposure, at least not by using interest rate derivatives.[21] Of the 268 banks that first reported MSAs in 1996, only about one in eight (12.9 percent) reported holding nontrading interest rate derivatives, and only 0.7 percent reported holding them for the first time. For 1997, these proportions increased slightly to one in six (16.2 percent) and 2.2 percent.

6. Concluding Remarks.

[19]Some limited support for hypothesis #3 comes from the authors' informal poll of national bank examiners at a small number of banks whose servicing portfolios had grown but whose MSAs had not been reported. Though certainly not a statistically valid sample, in most cases the examiners reported that the banks had determined, with the concurrence of outside auditors, that the amounts of MSAs they could capitalize under SFAS 122 were not material.

[20]We examined the possibility of multicollinearity among the independent variables. Among other diagnostics, the stability of the estimated coefficients and standard errors across several different specifications of the logit model and the absence of exceptionally large estimated standard errors satisfied us that there were no serious problems along these lines.

[21]This does not mean that bank servicers have a lot of unhedged interest rate risk exposure. In fact, the interest rate sensitivity of MSAs is typically offset by the sensitivity of other assets including mortgage, auto, and fixed-rate commercial loans.

In examining the impact of SFAS 122 in the first years after adoption, our most surprising finding was the large proportion of banks who, although having apparently recently acquired or originated servicing, did not report the value of mortgage servicing assets on the balance sheet. This nonreporting phenomenon was a unique opportunity to study the impact of a new asset reporting requirement. The focus of our investigation has been the analysis of the determinants of the decision to begin reporting the asset; this line of inquiry was made possible through the use of data on the total balance of mortgages serviced for others that commercial banks are required to report to federal regulators.

While issuances of the FASB are generally regarded as mandatory, we found there is some leeway in the case of SFAS 122, because the servicing assets at issue are often small relative to assets or income for many of the banks in our study, and thus could be deemed immaterial. We advance the hypothesis that many of these banks preferred not to recognize the assets because of the interest rate risk they embody or because of the expense of valuation and impairment testing, and that those banks were able to invoke the well-known but vaguely defined accounting concept of immateriality in deciding not to report them.

In our empirical investigation, we tested several hypotheses concerning the reporting decision among banks that had not previously disclosed servicing on the balance sheet. We found that those with larger and faster-growing portfolios were more likely to begin to report MSAs. We also found some evidence that banks that engage in other, fee-oriented operations are more likely to disclose their servicing assets. The size of the bank had no measurable impact on the reporting decision, nor did the firm's willingness to hold interest rate derivatives. Finally, the size of the servicing portfolio relative to bank

earnings had only a limited impact, while the size of the portfolio relative to assets had none.

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Table 1: *Summary of 1,917 Commercial Bank Mortgage Servicers during 1993-1997*

	1993	**1994**	**1995**	**1996**	**1997**
Insured commercial Banks	11,551	11,060	10,534	10,117	9,708
average total assets ($millions)	340.39	383.77	433.59	478.12	542.18
number with servicing for others	1,465	1,512	1,579	1,622	1,658
% of all commercial banks	12.68%	13.67%	14.99%	16.03%	17.08%
average total assets ($millions)	989.6	1,071.7	1,191.4	1,549.5	1,873.9
average mortgage portfolio serviced for others ($millions)	198.7	242.2	298.9	467.4	535.3
number reporting servicing assets	144	158	192	460	569
% of all commercial banks	1.25%	1.43%	1.82%	4.55%	5.86%
average total assets ($millions)	5,767.8	7,326.8	7,181.1	4,193.7	4,816.9
average mortgage portfolio serviced for others ($millions)*	1,728.7	2,070.1	2,263.7	1,639.2	1,598.2
average servicing assets for those reporting ($millions)	8.9	13.1	18.0	15.6	17.8

*Banks reporting MSAs but zero servicing for others (presumably due to a reporting error) were excluded from calculations.
Source: Fourth quarter call reports for the years specified.

Table 2: *Reporting of Mortgage Servicing Assets by Banks during 1993-97*

	1993	**1994**	**1995**	**1996**	**1997**
reported servicing for others .	1,465	1,512	1,579	1,622	1,658
reported servicing but no servicing assets[*]	1,331	1,364	1,394	1,178	1,119
servicing growth but no servicing assets		852	796	611	562
new servicer but no servicing assets		101	114	75	59

*The discrepancy between these totals and those that can be derived from table 1 occurs because a small number of institutions reported MSAs but no servicing for others. These appear to represent reporting errors.
Source: Fourth quarter call reports for the years specified.

Table 3: *The Value of MSAs Relative to Bank Size and Income for Banks with Growth in Servicing from 1996-1997*

MSA Value Relative to Assets	**Mean**	**Median**	**>1/2%**	**> 1%**
No MSAs Reported 1997[*]				
MSAs/Total Assets	0.165%	0.072%	5.2%	1.1%
MSA Growth/Total Assets	0.031%	0.013%	0.7%	0.4%
MSAs Reported 1997				
MSAs/Total Assets	0.434%	0.207%	19.4%	7.7%
MSA Growth/Total Assets	0.108%	0.033%	3.6%	1.8%
MSA Value Relative to Earnings	**Mean**	**Median**	**>3%**	**>5%**
No MSAs Reported 1997[*]				
MSAs/Earnings	9.131%	4.547%	59.9%	47.3%
MSA Growth/Earnings	2.035%	0.800%	14.9%	7.3%
MSAs Reported 1997				
MSAs/Earnings	29.904%	13.039%	88.0%	80.1%
MSA Growth/Earnings	7.232%	1.896%	36.1%	24.0%

[*]For nonreporting banks, MSA value is estimated as 1 percent of the balance of mortgages serviced for others, and MSA Growth is estimated as 1 percent of the 1996-1997 growth in the balance of mortgages serviced for others. (Banks with zero or negative 1997 earnings excluded from calculations.)

Table 4: *Changes in Banks' Mortgage Servicing Volume during 1994-97*

	1994	1995	1996	1997
increase in servicing portfolio . . .	953	948	957	911
reported servicing asses	101	135	330	394
(percentage)	(10.6%)	(14.2%)	(34.5%)	(43.3%)
decline in servicing portfolio	618	732	759	780
reported servicing assets	48	81	116	147
(percentage)	(7.8%)	(11.1%)	(15.3%)	(18.9%)
entered servicing industry[*]	109	135	104	94
exited servicing industry[*]	62	68	61	58

[*]Industry entry includes banks that reported servicing for others when they had none during the previous year, while
industry exit includes banks that reported no servicing for others after having reported it during the previous year.

Table 5: Results of Logistic Regressions

	MSA reporting in 1996	**MSA reporting in 1997**
Number of banks with servicing but no previous MSAs	1,442	1,219
Number of banks that began to report MSAs for the first time	268	120
intercept	**-8.0511** (0.0001)	**-8.2630** (0.0001)
bank asset size *ln(assets)*	-0.0972 (0.3099)	-0.0812 (0.5673)
servicing portfolio size *ln(mso)*	**0.7748** (0.0001)	**0.7007** (0.0001)
servicing growth *msog*	**4.056E-6** (0.0006)	**0.0019** (0.0001)
materiality relative to assets *amat*	-0.3333 (0.1354)	-0.5054 (0.4586)
materiality relative to earnings *emat*	2.6039 (0.1099)	**3.8704** (0.0203)
non-traditional income *ndum*	**0.3197** (0.0567)	0.2610 (0.2809)
interest rate derivatives *ddum*	0.0946 (0.7598)	-0.9603 (0.1166)
R^2	0.2903	0.2814
*Percent correct predictions**	82.9%	91.3%

P-values are provided in parentheses below the parameter estimates.
Bold font indicates significance at or above the 10 percent level

*A prediction is considered correct if the estimated probability of reporting MSAs for an individual bank is 50% or higher and the bank actually did report MSAs in the year specified, or if the estimated probability is below 50% and the bank actually did not report MSAs that year.