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Bank Performance around the Introduction of a Section 20 Subsidiary

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and HASSAN TEHRANIAN*

ABSTRACT

As of 1987, commercial banks in the United States were allowed to establish Section 20 subsidiaries to conduct investment-banking activities. A concern of regulators was that these activities would result in a decrease in performance of commercial banks relative to the risk being undertaken. This paper examines the performance of commercial banks around the establishment of a Section 20 subsidiary. We find that Section 20 activities undertaken by banks result in increased industry-adjusted operating cash flow return on assets, due mainly to revenues from noncommercial-banking activities. Further, risk measures for the sample banks do not change significantly.

REGULATORY BARRIERS AND RESTRICTIONS governing the operations of the U.S. financial system have often inhibited a depository institution's ability to operate in one area of the financial services industry and expand its product set into other areas. Specifically, the 1933 Banking Act (the Glass–Steagall Act) sought to impose a rigid separation between commercial banking and investment banking. Particularly, regulators noted concerns about the possible increase in riskiness and decrease in profitability that may arise when commercial banking and investment banking activities are affiliated in one organization.

For most of the 1933 through 1963 period, commercial banks and investment banks generally appeared to be willing to abide by the letter and spirit of the Glass–Steagall Act. Between 1963 and 1987, however, banks challenged restrictions on their ability to underwrite securities such as municipal revenue bonds, commercial paper, and mortgage-backed securities. In most cases, the courts eventually permitted these activities for commercial banks.

With this *de facto* erosion of the Glass–Steagall Act by legal interpretation, the Federal Reserve Board in April 1987 allowed commercial bank holding companies (BHCs)—such as First Union Corporation, the parent of First

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Union National Bank (a commercial bank)—to establish separate Section 20 securities affiliates as investment banks. Under the Federal Reserve's interpretation of the law, these Section 20 subsidiaries did not violate Section 20 of the Glass–Steagall Act as long as the revenue generated from the subsidiaries' ineligible securities activities amounted to no more than 5 percent (increased in 1989 to 10 percent and in 1996 to 25 percent) of the total revenues they generated.¹ The erosion of the Glass–Steagall Act continued into the 1990s as in 1997, the Federal Reserve allowed commercial banks to directly acquire existing investment banks as Section 20 subsidiaries rather than establish completely new Section 20 subsidiaries. Finally, in 1999, the U.S. Congress passed the Financial Services Modernization Act which repealed the legal barriers between commercial banks and investment banks (as well as insurance companies) allowing these financial institutions to engage in banking activities and securities and insurance underwriting.

The regulatory changes enacted in the late 1980s and 1990s allowed commercial banks to diversify their activities away from the traditional deposit taking and lending activities into securities underwriting. A number of papers have looked at the impact of securities underwriting on various aspects of commercial banks. Most recently, Bhargava and Fraser (1998) examine stock returns of commercial banks around four Federal Reserve Board decisions (in the 1980s and 1990s) to allow bank holding companies to engage in investment banking through Section 20 subsidiaries. They find that commercial banks experienced positive abnormal stock returns as the Federal Reserve (the Fed) initially allowed underwriting activities, but negative abnormal returns as the Fed expanded banks' abilities to underwrite corporate debt and equity. Fields and Fraser (1999) look at the extent to which commercial banks that expand into investment banking have adopted pay–performance compensation systems that are similar to those used by investment banks. They find that pay–performance sensitivity of the commercial bank CEO does indeed increase during the transition into securities underwriting activity. However, pay–performance sensitivity at these commercial banks remains significantly less than that of investment banks. Puri (1999) derives a theoretical model that shows that (a) commercial banks, as lenders to firms, can actually be better certifiers of quality than investment banks, and (b) equity holdings by commercial banks can hinder their certification ability. Finally, Gande, Puri, and Saunders (1999) examine the competitive effects of commercial bank entry into corporate securities underwriting. They find that, consistent with increased competition, underwriter spreads and ex ante yields have declined significantly with bank entry. Also, bank entry into securities underwriting has decreased underwriting market concentration.

¹ This means that 75 percent of the revenues of the Section 20 subsidiary must be generated from eligible securities activities, such as government bond underwritings, which the Glass–Steagall Act permitted. Also note that the 25 percent revenue restriction has created incentives for banks to make these subsidiaries as large as possible on the basis that 25 percent of a very large number is itself a large number.

In this paper, we examine the performance of 40 commercial banks that started underwriting securities through the establishment of a Section 20 subsidiary from 1987 through 1997. If the entry of commercial banks into securities underwriting affects performance, we expect to see changes in various accounting and risk measures for these commercial banks. For example, commercial banks that establish a Section 20 subsidiary would generate additional fees, which can improve performance. However, as was the concern that produced Glass–Steagall, nonbanking activities may also affect the risk (e.g., stock price volatility) of the bank.

We examine how Section 20 banks perform relative to competitors in the industry. Underwriting activities make commercial banks more similar to investment banks. Thus, a comparison of the Section 20 banks' performance to only non-Section 20 commercial banks is at best incomplete. Accordingly, we examine performance changes using comparison groups from both the commercial banking and investment banking industries to capture the impact of the underwriting activities on Section 20 commercial banks relative to firms in both competing industries.²

Our results confirm that the performance of the sample banks did indeed change as commercial banks diversified their activities by establishing a Section 20 subsidiary. Specifically, the pretax cash flow performance of banks improves significantly in each of the three years following the establishment of the Section 20 subsidiary relative to commercial bank and, separately, investment bank comparison groups. In addition, accounting measures show that the increase in the performance of the sample banks is due to increased revenue from the new line of business. Further, none of the risk measures we examine increases significantly after the establishment of the Section 20 subsidiary. These results suggest that the establishment of Section 20 subsidiaries and the changes in Glass–Steagall barriers in the 1980s and the 1990s have been beneficial to the performance of commercial banks relative to non-Section 20 commercial banks as well as investment banks.

The remainder of the paper is organized as follows. Section I describes the sample construction. Section II introduces and explains the performance measures used in the study. Section III summarizes the empirical results and Section IV concludes the paper.

I. Sample Construction

This study examines the establishment of a Section 20 subsidiary by publicly traded commercial banks in the United States during the period from April 1987, when the Federal Reserve allowed commercial bank holding companies to establish separate Section 20 securities affiliates, to December 1997. The sample period ends in 1997 because postissue data are needed to measure performance changes. At the time the empirical work was com-

² We are grateful to an anonymous referee for suggesting this dual industry comparison test.

Table I
The Year the Approval of the (First) Section 20 Subsidiary
by the Federal Reserve Became Effective

The effective dates of Federal Reserve Section 20 approval were compiled using the Web site of the Board of Governors of the Federal Reserve System (<http://www.federalreserve.gov/generalinfo/section20/>) and the Federal Reserve Bulletins. Bank merger and acquisition (M&A) information was obtained from the Federal Reserve Bank of Chicago's merger databases for commercial banks and bank holding companies (BHCs).

Year Approval Became Effective	Full BHC Sample (<i>n</i> = 40)	Sample of BHCs Not Involved in a M&A During the Three Years Surrounding the Section 20 Approval (<i>n</i> = 19)
1987	11	7
1988	5	3
1989	5	2
1990	3	1
1991	2	2
1992	0	0
1993	2	0
1994	5	2
1995	1	0
1996	2	1
1997	4	1

pleted, 1999 data were the latest available. This results in at least two years, and mainly three years, of post-Section 20 subsidiary data for each of the sample banks.

The initial sample of bank holding companies whose Section 20 subsidiaries are approved for securities underwriting is collected from the Web site of the Board of Governors of the Federal Reserve System. Bank holding companies may have more than one Section 20 subsidiary approved during different years. If more than one Section 20 subsidiary exists, we select only the first Section 20 subsidiary that was approved by the Federal Reserve. We also eliminate foreign BHCs from the list. The Federal Reserve Bulletins are used to authenticate the dates upon which approvals became effective. The final sample includes 40 BHCs that established Section 20 subsidiaries between March 1987 and December 1997. The Appendix lists the BHCs in the final sample and their Section 20 subsidiary.

Financial statement information needed to calculate bank performance is obtained from the Bank Holding Company Report of Income and Report of Condition (Y-9 Reports) database. The Y-9 data report information by bank holding company. Table I lists the distribution of the sample by the year the first Section 20 subsidiary is established (i.e., approval by the Federal Reserve became effective). Notice that the majority of the sample banks (21 of the 40) established Section 20 subsidiaries between 1987 to 1989, shortly

Table II
Summary Statistics for Commercial Bank Holding Companies
That Established a Section 20 Subsidiary

Data were obtained from the Bank Holding Company Report of Income and Report of Condition (Y-9) data tapes. All dollar amounts are millions of 1998 dollars (dollar figures from the Y-9 Reports were inflated using the Consumer Price Index). Operating pretax cash flow is defined as earnings before income taxes and extraordinary items plus interest on subordinated notes and debentures. Year 0 refers to the year the Section 20 subsidiary approval became effective.

Sample of Banks with a Section 20 Subsidiary				
Year	Mean	Median	Minimum	Maximum
Book Value of Total Assets (in Millions of 1998 Dollars)				
0	62,742.4	44,203.5	4,293.3	289,308.5
Operating Pretax Cash Flow (in Millions of 1998 Dollars)				
0	310.1	306.6	-1,368.3	2,888.5
Nonbanking Assets to Total Assets				
-2	3.44%	1.35%	0.00%	18.67%
+2	7.15%	5.13%	0.01%	25.05%

after the Federal Reserve first allowed banks to expand their activities by establishing these separate securities affiliates. Thus, domestic commercial banks were quick to enter this new area.

The period covered in our study includes not only the establishment of new Section 20 subsidiaries, but also many commercial bank mergers and acquisitions. Indeed, many of the banks in our sample not only established a Section 20 subsidiary, but were also involved in a merger or acquisition during the period under study. Cornett and Tehranian (1992) find that merged banks outperform the banking industry during the three years following the merger or acquisition. Should we find that performance of our sample banks improves relative to a benchmark after the establishment of a Section 20 subsidiary, we need to keep in mind that the results may be due to the merger or acquisition by the bank rather than the establishment of a Section 20 subsidiary. To check for this possibility, we identify a subsample of those 19 banks in our sample that were *not* involved in a merger or acquisition in the three years surrounding the establishment of the first Section 20 subsidiary. Table I also lists the distribution of these 19 banks by the year the Section 20 subsidiary was established.

Table II lists summary statistics of the sample, including the book value of total assets (in millions of 1998 dollars) of the bank at year-end prior to the establishment of the Section 20 subsidiary, the operating pretax cash flow (defined as earnings before taxes and extraordinary items, plus interest on

subordinate notes and debentures), and nonbanking assets as a percent of total assets two years before and after the establishment of the Section 20 subsidiary. The nonbanking assets of the sample banks include those from the Section 20 subsidiary.³ Note the increase in nonbanking assets in year -2 relative to $+2$. The mean value of nonbanking assets to total assets increases from 3.44 percent to 7.15 percent. The difference is significant at the 1 percent level. All accounting data used to tabulate information in the table are obtained from the Bank Holding Company Report of Income and Report of Condition database. Dollar amounts are in millions of 1998 dollars. That is, dollar figures from the database are adjusted using the Consumer Price Index.

II. Performance Measures

The measures we use to test operating performance around the establishment of a Section 20 subsidiary by commercial banks are those in Cornett and Tehranian (1992) and Cornett, Mehran, and Tehranian (1998). Cornett and Tehranian look at merger-related operating performance changes in commercial banks. Cornett et al. look at performance around voluntary versus involuntary equity issuances at commercial banks. We collect cash flow data for the sample banks both before and after the establishment of a Section 20 subsidiary. A comparison of the post-Section 20 values with the pre-Section 20 benchmark allows us to measure the impact of the establishment of a Section 20 subsidiary on the performance of the bank. Like Cornett and Tehranian and Cornett et al., we use operating pretax cash flows divided by the year-end book value of assets to evaluate performance.

We obtain a pre-Section 20 operating pretax cash flow performance benchmark for years -3 to -1 before the establishment of a Section 20 subsidiary. We divide the measure by the book value of assets to provide a return metric that is comparable across firms. The post-Section 20 operating cash flows of the bank are computed for years 1 to 3 after the establishment of a Section 20 subsidiary. Again, the cash flow measure is deflated by the book value of assets to yield a normalized measure of performance. We examine cash flow performance changes for the full sample of banks that established a Section 20 subsidiary and for the subsample of banks that were not involved in a merger and acquisition in the three years surrounding the establishment of the Section 20 subsidiary. We also compare performance based on the degree to which the bank expanded its activities. That is, we compare cash flow performance changes for the subsample of banks with a ratio of nonbanking assets to total assets (in year 1 after the establishment of a Section 20 subsidiary) greater than the median value (5.52 percent) to the

³ Data specific to the Section 20 subsidiaries are in Y-20 reports, which are not publicly available. However, the nonbank asset and revenue ratios should provide a good proxy of the level of the banks' diversifying activities, since (due to restrictive regulations) banks generally hold few nonbank assets.

subsample of banks with a ratio less than the median value. The mean value of this ratio for the first subsample (those with a ratio greater than the median) is 12.01 percent, and for the second subsample is 2.13 percent. A *t*-test on the difference in these values is significant at the 1 percent level.

Changes in the pre- and postissue operating performance are examined on both an unadjusted basis and matched adjusted basis. Matched adjusted comparisons allow us to examine performance changes in Section 20 banks irrespective of any industrywide factors that may be affecting operating pretax cash flow return on assets. Any industry trends would affect values for bank medians. Thus, a change in unadjusted operating performance may be due to factors other than the establishment of a Section 20 subsidiary. Following Barber and Lyon (1996), the matching process employs three characteristics: (1) industry (commercial banking and, separately, investment banking), (2) size, and (3) operating pretax cash flow returns. We describe the matching process in detail below. Matching the sample banks to these characteristics allows us to compare their performance to that of the most similar industry competitors.

Our first matched adjusted comparison group includes all commercial banks that did not establish a Section 20 subsidiary prior to 1998, have book values of total assets greater than \$1 billion, and are similar to the sample banks in operating pretax cash flow return on assets prior to the establishment of a Section 20 subsidiary. The banks are identified using the Y-9 financial statement data provided by the Federal Reserve Bank of Chicago. We use a filter for the matched bank's operating pretax cash flow return on assets of 90 percent to 110 percent. We use the 90 percent to 110 percent filter because Barber and Lyon (1996), who look at results of this methodology using alternative filters, find this range to yield statistics that are well specified in these sampling situations. We are able to identify at least one match firm for each of our sample banks.⁴

Underwriting activities make commercial banks more similar to investment banks. Thus, we develop a second matched adjusted comparison group that includes all publicly traded investment banks with a book value of assets greater than \$0.5 billion (in 1998 dollars) and that are similar to the sample banks in operating pretax cash flow return on assets (using the 90 percent to 110 percent filter). We reduce our screen on total asset value for the subsample of investment banks because relatively few investment banks had total assets greater than \$1 billion. Investment banks are identified using the CRSP data tapes and accounting information is collected from *Moody's Bank and Finance Manuals* (and is converted to 1998 dollars).

Consistent with Barber and Lyon (1996), we use each bank's unadjusted performance minus the median performance of the industry comparison group as the matched performance adjusted measure. For all of our tests, we hold the industry comparison firms (either commercial banks or investment banks)

⁴ For the sample banks in which multiple matched banks were identified, the matched banks were located throughout the country.

constant over time. Thus, the matched firms selected for the sample banks in the year prior to establishment of a Section 20 subsidiary remain the same from year -3 to year $+3$. Also, to avoid any impact that outlier observations may have on our results, we use median performance results for both the unadjusted data and the matched performance adjusted data.

To identify the sources of any changes in the operating pretax cash flow performance after the establishment of a Section 20 subsidiary, we evaluate six common bank performance indicators (as in Cornett and Tehranian (1992)):

1. Profitability indicators: measure overall performance;
2. Capital risk indicators: measure the bank's ability to meet regulated capital standards and still attract loans and deposits;
3. Asset quality indicators: measure the changes in the bank's loan quality and risk;
4. Operating efficiency indicators: measure the bank's ability to generate revenue, pay expenses, and measure employee productivity from commercial banking and/or investment banking activities;
5. Liquidity risk indicators: measure the change in the bank's cash position;
6. Growth indicators: measure the bank's change in assets.

The specific measures used to represent these factors are defined in Table III. We examine these six indicators of bank performance and risk in an attempt to identify specific areas within the Section 20 bank that might drive any changes in operating pretax cash flow performance.

There is collinearity between some of the specific ratios representing the different factors (e.g., investments to assets and liquid assets to assets). Therefore, changes in the various areas of performance may be a result of common elements. As we did for operating cash flow returns, we measure all accounting ratios for three years before and after the establishment of a Section 20 subsidiary. The comparison group used to determine industry adjusted values consists of all commercial banks not in the Section 20 sample.⁵ Changes in the industry adjusted accounting ratios of the banks are tested using the t -statistic,

$$t = \left(\sum_{i=1}^N (d_{post} - d_{pre}) / N \right) / (\sigma / \sqrt{N}), \quad (1)$$

where d_{post} is the value of the ratio after the establishment of a Section 20 subsidiary, d_{pre} is the value of the ratio before the establishment of a Section 20 subsidiary, σ is the standard deviation of the distribution of the change in the ratio across the sample banks, and N is the number of banks in the sample. Both the bank performance and the matched adjusted performance are tested using equation (1).

⁵ Because of the differences in the composition of commercial bank and investment bank balance sheets (e.g., investment banks have no loans on the balance sheet), we do not conduct similar analysis using investment banks as the comparison group.

Table III
Ratios Used to Analyze Performance Around the Establishment
of a Section 20 Subsidiary

Ratio	Definition
Profitability indicators	
(1) Return on assets	Net income after taxes as a percent of book value of total assets
(2) Return on equity	Net income after taxes as a percent of book value of total equity capital
Capital risk indicators	
(3) Core capital to assets	Shareholders' equity as a percent of book value of total assets
(4) Loans to total capital	Total loans as a percent of book value of total capital
(5) Deposits to total capital	Total deposits as a percent of book value of total capital
Asset quality indicators	
(6) Loan losses to loans	Charge-offs and allowance for loan losses as a percent of total loans and leases
Operating efficiency indicators	
(7) Noninterest exp. to noninterest rev.	Noninterest expenses as a percent of noninterest revenue
(8) Net interest margin	Net interest income as a percent of investment securities and loans
(9) Nonbanking rev. to total rev.	Nonbanking revenue as a percent of total revenues
(10) Return on loans	Interest and fees on loans to total loans and leases
(11) Employee exp. to noninterest exp.	Salaries and employees benefits as a percent of noninterest expenses
(12) Employee exp. to total assets	Salaries and employees benefits as a percent of total assets
Liquidity risk indicators	
(13) Loans to assets	Total loans as a percent of book value of total assets
(14) Investment securities to total assets	Book value of total investment securities as a percent of book value of total assets
Growth indicators	
(15) Asset growth rate	Change in book value of total assets as a percent of book value of total assets in the previous year
(16) Nonbanking assets	Nonbanking assets as a percent of total assets
(17) Nonbanking assets growth rate	Change in nonbanking assets as a percent of nonbanking assets in the previous year

III. Empirical Results

A. Cash Flow Returns

Table IV presents bank and performance matched adjusted median annual operating pretax cash flow return on assets for the sample banks in the years surrounding the establishment of a Section 20 subsidiary. It is difficult to draw conclusions from median results because these data do not adjust

Table IV
Bank and Performance Matched Adjusted Median Annual Operating Pretax Cash Flow Return
on Assets in the Years Surrounding the Establishment of a Section 20 Subsidiary
by Commercial Banks Between 1987 and 1997

Operating pretax cash flow return on assets is income before taxes and extraordinary items plus interest on subordinate notes and debentures as a percentage of the book value of assets as of the end of the year. In Panels A and B, performance matched adjusted values are computed as the difference between the bank value and all banks with book value of assets greater than \$1 billion and between 90 percent and 110 percent of bank *i*'s cash flow return on assets the year prior to the establishment of the Section 20 subsidiary. In Panel C, performance matched adjusted values are computed as the difference between the bank value and all investment banks with book value of assets greater than \$0.5 billion and between 90 percent and 110 percent of bank *i*'s cash flow return on assets the year prior to the establishment of the Section 20 subsidiary. The *p*-values are based on a Mann-Whitney-Wilcoxon test.

Year Relative to Establishment of Section 20 Subsidiary	Panel A: Full Sample				Panel B: Banks Not Involved in M&A				Panel C: Full Sample Relative to Investment Banks			
	Number of Observations	Bank Median (%)	Performance Matched Adjusted		Number of Observations	Bank Median (%)	Performance Matched Adjusted		Number of Observations	Bank Median (%)	Performance Matched Adjusted	
			Percent Positive (%)	Median (%)			Percent Positive (%)	Median (%)			Percent Positive (%)	Median (%)
-3	40	1.37	0.11	60.0	19	1.49	0.09	58.0	40	1.37	-0.18	48.0
-2	40	1.45	-0.03	52.0	19	1.58	-0.04	47.0	40	1.45	-0.14	50.0
-1	40	1.57	0.06	58.0	19	1.60	0.03	53.0	40	1.57	-0.20	45.0
Median annual performance for years -3 to -1		1.49	0.06	60.0		1.56	0.03	53.0		1.48	-0.17	50.0
1	40	1.78	0.95 ^a	80.0 ^c	19	1.78	0.83 ^b	79.0 ^c	40	1.78	0.99 ^a	78.0 ^c
2	38	1.50	0.74 ^b	79.0 ^c	18	1.47	0.78 ^b	72.0 ^d	38	1.50	0.85 ^b	74.0 ^d
3	34	1.68	0.85 ^b	73.0 ^c	17	1.60	0.88 ^a	76.0 ^c	34	1.68	0.91 ^a	79.0 ^c
Median annual performance for years 1 to 3		1.68	0.84 ^b	77.0 ^c		1.64	0.84 ^b	76.0 ^c		1.68	0.93 ^a	78.0 ^c

^a Significantly different from zero at the one percent level.
^b Significantly different from zero at the five percent level.
^c Wilcoxon signed ranks test statistic is significant at the one percent level.
^d Wilcoxon signed ranks test statistic is significant at the five percent level.

for industry factors that may be affecting the cash flow returns of the banks. Any trend would affect values for the bank medians, so a change may be due to factors other than the Section 20 subsidiary. To account for the impacts of contemporaneous events, we also report matched adjusted median performance measures in Table IV.

Panel A looks at results for the full sample relative to matched adjusted commercial banks. Since we match the sample banks using cash flow returns in the year prior to the establishment of a Section 20 subsidiary, it is not surprising that the median matched adjusted performance is not significantly different from zero for any year examined prior to the establishment of a Section 20 subsidiary. After the Section 20 subsidiary is established, however, operating pretax cash flow returns improve significantly relative to the matched banks. It is also notable that the improvement in performance is immediate: The performance matched adjusted returns are 0.95 percent (significant at the 1 percent level) the year immediately following the establishment of a Section 20 subsidiary. Further, the superior performance continues as time progresses. The third year after the Section 20 subsidiary is established the banks are operating at a rate of 0.85 percent above the matched firms (significant at the 5 percent level). For the three-year period after the Section 20 subsidiary is established, the sample banks outperform the matched sample by 0.84 percent. Further, for this period, 77.0 percent of the sample banks have positive matched adjusted returns (significant at the 1 percent level). We calculate the proportion of the sample banks whose matched adjusted cash flow is less than zero and perform a Wilcoxon signed rank test to determine significance. These results are also reported in Table IV. From these results, the establishment of a Section 20 subsidiary appears to be associated with a general increase in the level of operating pretax cash flow returns on assets for the bank and is not the result of outliers.

As an alternative to this test, we also look at operating pretax cash flow to common equity of the sample banks. Because underwriting activities do not require significant levels of assets, performance changes based on assets may be mechanical. Underwriting activities do, however, risk capital. Thus, Section 20 banks may increase common equity as a cushion against the increase in risk. As a result, operating cash flow return on assets may increase while operating cash flow return on equity may not. Similar to the results in Table IV, we find that matched adjusted operating cash flow return on equity is insignificant in the three years prior to the establishment of a Section 20 subsidiary.⁶ In the three years after the establishment of the Section 20 subsidiary, however, the matched adjusted cash flow return on equity is positive and significant at better than the 5 percent level. Thus, Section 20 bank performance increases relative to both assets and equity.⁷

⁶ In this case, we obtain the matched sample using all banks with book value of assets greater than \$1 billion and between 90 percent and 110 percent of bank *i*'s cash flow return on equity.

⁷ Copies of the results are available from the authors.

As mentioned above, the distribution of the sample is not uniform across the sample period. For example, 11 of the observations occur in 1987, just after the Federal Reserve first allowed banks to expand their activities into securities underwriting. To address this clustering of the data, we analyze operating pretax cash flow return on assets in two ways. First, we split the sample in half; 20 banks that established a Section 20 subsidiary on or prior to August 1, 1989 versus 20 banks that established a Section 20 subsidiary after August 1, 1989. The conclusions from data on these two subsamples are identical to those in Table IV. That is, for both groups matched adjusted operating cash flow return on assets is insignificant in the three years before the Section 20 subsidiary is established. Further, matched adjusted operating cash flow returns are positive and significant in the three years after the Section 20 subsidiary is established. Comparing the results across the two subsamples, we find no significant differences.^{8,9}

Second, for each year, we rank order the operating pretax cash flow returns. We then select the median operating cash flow return as the representative bank for that year. For example, we rank order the 11 observations in 1987 by operating pretax cash flow returns and select the sixth (median) observation to represent 1987. This process is repeated for each year (note that the sample includes no acquisitions in 1992) leaving us with a sample of 10 firms. The conclusions from data on these 10 firms are also identical to those from Table IV. That is, matched adjusted cash flow returns are not significantly different from zero in the three years before the Section 20 subsidiary is established. Further, operating cash flow returns are positive and significant in the three years after the Section 20 subsidiary is established. Thus, the clustering of banks across the 11 years does not appear to be affecting the results.¹⁰

Panel B of Table IV presents bank and matched adjusted operating pretax cash flow return on assets for the 19 banks in the sample that were not involved in a merger and acquisition in the three years surrounding the establishment of a Section 20 subsidiary. As discussed above, Cornett and Tehranian (1992) found that bank performance increased in the three years following a merger. To ensure that the results in Panel A of Table IV are not

⁸ Because over a quarter of the sample is from 1987, we also examine the results using the 11 banks that established a Section 20 subsidiary in 1987 versus the 29 banks that established a Section 20 subsidiary in 1988 through 1997. The conclusions are again the same. That is, operating cash flow returns increase significantly for both subgroups in the three years after the Section 20 subsidiary is established. Also, no significant differences exist across the two subsamples. Results are available from the authors.

⁹ Note that this test also creates a split of the sample before versus after the revenue requirement increased from 5 percent to 10 percent. The doubling of the limit on revenue from underwriting activities to total revenue does not appear to have affected the increase in Section 20 banks performance. It is possible that the increase from 5 to 10 percent was not sufficient to cause an additional significant increase in operating performance. The increase in the revenue limit to 25 percent occurred in 1996. Given that our sample period ends in 1997, we do not have sufficient observations to look at the impact of this change on operating performance.

¹⁰ Copies of the results are available from the authors.

due to the performance of banks involved in a merger or acquisition, we report the results for those banks not involved in a merger or acquisition in Panel B. Post-Section 20 performance for this subsample is unaffected by mergers and acquisition *a la* Cornett and Tehranian.

Consistent with the results reported in Panel A for the full sample of banks, this sample's cash flow returns are equal to the benchmark cash flow returns throughout the three years before the Section 20 subsidiary is established. In the three years after the Section 20 is established, the banks outperform the matched adjusted banks significantly. The median annual matched adjusted performance for the three years is 0.84 percent (significant at the 5 percent level). Wilcoxon ranked sign tests confirm this result is not driven by outliers. Thus, it appears that the results for the full sample are not a consequence of mergers and acquisitions. Rather, the establishment of a Section 20 subsidiary improves the operating performance of the banks.

Finally, Panel C of Table IV presents operating pretax cash flow returns for commercial banks that established a Section 20 subsidiary relative to investment banks. As the sample commercial banks expand into the investment banking industry, it is appropriate to compare their performance to that of their competitors in this new line of business. In the three years prior to the establishment of the Section 20 subsidiary, the matching process results in cash flow returns for the sample banks that are not statistically different from the matched investment banks. In the three years after the establishment of the Section 20 subsidiary, however, the sample commercial banks outperform the matched investment banks significantly. The median matched adjusted operating performance for the three years is 0.93 percent (significant at the 1 percent level). Further, the Wilcoxon ranked signed tests confirm the results are not driven by outliers. Thus, not only do the Section 20 commercial banks improve performance relative to non-Section 20 commercial banks, but they outperform relative to investment banks as well.

The establishment of a Section 20 subsidiary by a bank does not necessarily mean that there is substantial activity in the new line of business. To conclude that the establishment of a Section 20 subsidiary leads to better performance, we need to ensure that an increase in operating cash flow returns is the result of activity from the Section 20 subsidiary. Thus, a final test of operating performance is that based on the percentage of nonbanking assets to total assets for the sample banks.¹¹ We separate the sample banks into two subgroups: (1) those with nonbanking assets to total assets in the year following the establishment of the Section 20 subsidiary greater than the median value for the sample (5.52 percent), and (2) those with nonbanking assets to total assets less than the median value.

Table V presents the bank and matched (with other commercial banks) adjusted operating cash flow return on assets for the two subgroups before and after the establishment of the Section 20 subsidiary. Panel A in Table V presents results for the banks with a ratio of nonbanking assets to total

¹¹ We are grateful to an anonymous referee for suggesting this comparison.

Table V
Bank and Performance Matched Adjusted Median Annual Operating Prefax Cash Flow Return on Assets Based on Nonbanking Assets as a Percentage of Total Assets for the Sample Banks

Operating pretax cash flow return on assets is income before taxes and extraordinary items plus interest on subordinate notes and debentures as a percentage of the book value of assets as of the end of the year. Performance-matched adjusted values are computed as the difference between the bank value and all banks with book value of assets greater than \$1 billion and between 90 percent and 110 percent of firm *i*'s cash flow return on assets the year prior to the establishment of the Section 20 subsidiary. High nonbanking asset banks are those with nonbanking assets to total assets in year one after the establishment of the Section 20 subsidiary greater than the sample median (5.52 percent). Low nonbanking asset banks are those less than the sample median. The *p*-values are based on a Mann-Whitney-Wilcoxon test.

Year Relative to Establishment of Section 20 Subsidiary	Panel A: High Nonbanking Assets				Panel B: Low Nonbanking Assets			Panel C: Differences in Match Adjusted Performance		
	Number of Observations	Bank Median (%)	Performance		Number of Observations	Bank Median (%)	Performance		Percent Difference (%)	Percent Positive (%)
			Matched	Adjusted Median (%)			Matched	Adjusted Median (%)		
-3	20	1.42	0.09	20	1.39	0.02	0.07	60.0		
-2	20	1.48	0.12	20	1.46	0.07	0.05	55.0		
-1	20	1.52	0.08	20	1.50	0.14	-0.06	45.0		
Median annual performance for years -3 to -1		1.49	0.10		1.47	0.08	0.02	55.0		
1	20	2.24	1.18 ^a	20	1.40	0.50 ^b	0.68 ^a	90.0 ^c		
2	19	2.01	1.08 ^a	19	1.37	0.46 ^b	0.62 ^a	84.0 ^c		
3	17	1.99	1.04 ^a	17	1.43	0.45 ^b	0.59 ^b	82.0 ^c		
Median annual performance for years 1 to 3		2.15	1.11 ^a		1.41	0.49 ^b	0.62 ^a	85.0 ^c		

^a Significantly different from zero at the one percent level.
^b Significantly different from zero at the five percent level.
^c Wilcoxon signed ranks test statistic is significant at the one percent level.

assets above the median value in year 1 after the Section 20 subsidiary is established, while Panel B lists the results for sample banks with values for this ratio below the median.

Both Panels A and B show that, similar to the results in Table IV, operating cash flow performance of the sample banks increases significantly more than that for banks that do not establish a Section 20 subsidiary. Comparing results across the two panels, in Panel C of Table V, we see that operating cash flow performance increases are significantly larger for those banks with the highest levels of nonbanking assets to total assets. The difference in the median annual matched adjusted performance is 0.68 percent the year following the establishment of the Section 20 subsidiary, 0.62 percent in year 2, and 0.59 percent in year 3. For the three years, the difference is 0.62 percent (significant at the 1 percent level). The Wilcoxon signed rank test is also significant each year.

The conclusion drawn from data reported in Tables IV and V is that operating pretax cash flow return on assets increases significantly for banks that expand their activities by establishing a Section 20 subsidiary relative to banks that do not, as well as to investment banks. The post-Section 20 operating performance improves immediately following the establishment of a Section 20 subsidiary and continues to improve for three years. Further, the more the bank expands into these new activities, the greater the improvement in operating performance.

B. Accounting Measures

To identify which, if any, accounting measures may explain the improved operating cash flow returns, as well as any changes in risk associated with the increase in cash flow returns, Table VI lists the changes in industry-adjusted values of several accounting ratios (listed in Table III) before versus after the establishment of a Section 20 subsidiary.

Ratios 1 and 2 in Table VI report industry-adjusted return on assets (ROA) and return on equity (ROE) of the sample banks for the three years before versus three years after the establishment of a Section 20 subsidiary. Notice that both ROA and ROE of the sample banks are greater than the industry before the Section 20 subsidiary is established. Additionally, superior performance increases for both measures after the Section 20 subsidiary is established. However, only the increase in ROE, 3.06 percent, is significant (at the 5 percent level). Likewise, the nonparametric test is significant for ROE (at the 5 percent level). Thus, using a traditional accounting measure of profitability (ROE), as well as cash flow returns, we find that nonbanking activities result in performance improvements for commercial banks.

Ratio 3 in Table VI reports no change in the core capital ratio for the sample banks. Thus, as banks expand into underwriting activities, it is without an increase in the risk that they are able to meet regulated capital standards. We do, however, see (from Ratios 4 and 5) significant decreases in both loans to capital ($-1.99\times$) and deposits to capital ($-1.15\times$) relative to

Table VI
Comparison of Industry-Adjusted Performance for Banks
in the Three Years before and after the Establishment
of a Section 20 Subsidiary between 1987 and 1997

Industry adjusted values are computed for each bank and year as the difference between the bank value in that year and the mean value for other banks in the industry.

Ratio	Industry-adjusted Values			Percent Positive
	Pre-Section 20	Post-Section 20	Difference	
Profitability indicators				
(1) Return on assets	0.10%	0.15%	0.05%	55.0
(2) Return on equity	0.23%	3.29%	3.06% ^b	77.5 ^d
Capital adequacy indicators				
(3) Core capital to assets	-0.33%	-0.04%	0.29%	55.0
(4) Loans to total capital	2.61×	0.62×	-1.99×	30.0 ^d
(5) Deposits to total capital	0.94×	-0.21×	-1.15×	30.0 ^d
Asset quality indicators				
(6) Loan losses to loans	0.14%	0.08%	-0.06%	47.5
Operating efficiency indicators				
(7) Noninterest exp. to noninterest rev.	-121.24%	-174.82%	-53.58% ^a	20.0 ^d
(8) Net interest margin	-0.29%	-0.51%	-0.22%	47.5
(9) Nonbanking rev. to total rev.	6.42%	12.83%	6.41% ^a	80.0 ^d
(10) Return on loans	-0.81%	-1.29%	-0.48%	47.5
(11) Employee exp. to noninterest exp.	-63.13%	-89.03%	-25.90% ^b	27.5 ^d
(12) Employee exp. to total assets	0.15%	-0.26%	-0.41% ^c	52.5
Liquidity risk indicators				
(13) Loans to assets	3.89%	1.25%	-2.64% ^b	30.0 ^d
(14) Investment securities to total assets	-8.71%	-8.99%	-0.28%	47.5
Growth indicators				
(15) Asset growth rate	8.62%	7.96%	-0.66%	47.5
(16) Nonbanking assets to total assets	164.28%	929.04%	764.76% ^a	80.0 ^d
(17) Nonbanking assets growth rate	3.94%	6.89%	2.94% ^b	72.5 ^d

^a Significantly different from zero at the one percent level.

^b Significantly different from zero at the five percent level.

^c Significantly different from zero at the 10 percent level.

^d Wilcoxon signed test statistic is significant at the five percent level.

the industry. Both the difference in industry-adjusted values of these measures, as well as the nonparametric tests, are significant (at the 10 percent and 5 percent levels, respectively). These results are not surprising given that the sample banks are expanding into the investment banking industry and, thus, are shifting away from traditional commercial banking lines (taking deposits and making loans).

Table VI reports no change in the loan losses to loans ratio for the sample banks relative to the industry after the establishment of the Section 20 subsidiary. Thus, the improved cash flow performance of the sample banks does

not appear to be driven by changes in the risk of the loan portfolio (the original line of business).

Ratios 7 through 12 in Table VI report several measures of operating efficiency. Notice that ratios pertaining strictly to the sample banks' commercial banking lines (net interest margin, Ratio 8, and return on loans, Ratio 10) exhibit no change in industry-adjusted performance before versus after the establishment of the Section 20 subsidiary. In contrast, ratios reflecting the bank's new line of business show significant increases relative to the industry after the Section 20 subsidiary is established. Nonbanking revenues to total revenue, Ratio 9, increase 6.41 percent relative to the industry and noninterest expense to noninterest revenue, Ratio 7, decreases 53.58 percent (both are significant at the 1 percent level). Additionally, measures that reflect efficiency of the combined businesses improve after the Section 20 subsidiary is established. Employee expenses to noninterest expense, Ratio 11, decrease 25.90 percent (significant at the 5 percent level) and employee expenses to total assets, Ratio 12, decrease 0.41 percent (significant at the 10 percent level) relative to the industry.

Ratio 13 in Table VI reports that loans to assets decrease relative to the industry for the sample banks after the Section 20 subsidiary is established. While a sign of increased liquidity, the change in this ratio is not surprising given that the banks are expanding into a new line of business. The decrease in this ratio demonstrates the shift in emphasis into underwriting activities from lending activities.

The asset growth rate reported in Table VI, Ratio 15, indicates that the sample banks are growing faster than industry: 8.62 percent before and 7.96 percent after the Section 20 subsidiary is established. However, the difference in these values is statistically insignificant. Thus, the introduction of underwriting activities does not affect the overall rate of growth for the banks. As would be expected, however, the percent of nonbanking assets to total assets, Ratio 16, increases significantly relative to the industry, 764.76 percent, after the Section 20 subsidiary is established. Further, the growth in nonbanking assets, Ratio 17, is significantly greater than the industry after the establishment of the Section 20 subsidiary, by 2.94 percent.

The conclusion drawn from Table VI is that banks that expand their activities by establishing a Section 20 subsidiary significantly shift assets from the traditional commercial banking lines to underwriting activities. Further, the improvement in performance of these banks is not the result of increased risk or of improvements in commercial banking activities, but is the result of income and efficiency improvements from these new activities.

C. Risk Measures

In Table VI we found that the improvement in cash flow performance of the Section 20 banks was not the result of changes in risk of the bank's loan portfolio. As an additional test of changes in bank risk around the establishment of a Section 20 subsidiary, we examine changes in the systematic

Table VII
Systematic Risk (Betas) and Total Risk (Sigma-Squares)
for Sample Banks and Matched Sample Banks Around
the Establishment of a Section 20 Subsidiary

Systematic risk is calculated using daily returns on the banks' common stocks during the year prior to and after the establishment of a Section 20 subsidiary using the standard market model. We employ the CRSP equally weighted index as the market portfolio. Total risk is the variance of the daily common stock returns during the year prior to and after the establishment of a Section 20 subsidiary. The matched sample banks include banks with book value of assets greater than \$1 billion and between 90 percent and 110 percent of bank *i*'s cash flow return on assets the year prior to the establishment of the Section 20 subsidiary.

	Sample Banks		Matched Sample Banks		Difference	
	Coefficient	<i>t</i> -statistic	Coefficient	<i>t</i> -statistic	Coefficient	<i>t</i> -statistic
Year prior to establishment of Section 20 subsidiary						
β	1.0741	4.89 ^a	1.0522	5.40 ^a	0.0219	1.02
σ^2	0.0204	5.12 ^a	0.0193	5.07 ^a	0.0019	0.97
Year after establishment of Section 20 subsidiary						
β	1.1032	4.73 ^a	1.0715	4.85 ^a	0.0317	1.10
σ^2	0.0231	5.20 ^a	0.0208	5.71 ^a	0.0023	1.08
Difference						
β	0.0291	1.12	0.0193	0.98		
σ^2	0.0027	1.03	0.0015	1.15		

^a Significantly different from zero at the one percent level.

and total risk of the sample banks' and, separately, of the matched sample banks' daily common stock returns in the year before versus the year after the establishment of the Section 20 subsidiary. The results are reported in Table VII.

As seen in Table VII, neither the systematic risk, β , nor the total risk, σ^2 , of the Section 20 banks changes significantly around the establishment of a Section 20 subsidiary.¹² The sample banks' average systematic risk is 1.0741 and 1.1032 before and after the Section 20 subsidiary is established, respectively. The total risk for the sample banks averages 0.0204 and 0.0231 before and after the Section 20 subsidiary is established, respectively. The differences in the risk measures before versus after the Section 20 subsidiary is established, 0.0291 and 0.0027, are not significant.

Table VII also reports that the systematic and total risk in common stock returns for the sample banks are not significantly different from the match banks before or after the Section 20 subsidiary is established. Before the

¹² Systematic risk, β , is calculated using the standard market model. The market portfolio used to calculate β is the CRSP equally weighted portfolio.

Section 20 subsidiary is established, the differences in β and σ^2 for the sample banks versus the match banks are 0.0219 and 0.0019, respectively. After the Section 20 subsidiary is established, the differences in β and σ^2 are 0.0317 and 0.0023, respectively. None of these values is significant.

From these results, we conclude that the improvements in operating pretax cash flow returns for banks that establish a Section 20 subsidiary are not the results of increased risk created by investment banking activities. Rather, improvements in operating cash flow returns are attributed to increases in revenue and decreases in operating expenses resulting from the new line of business.

IV. Conclusion

In this paper, we look at the performance of commercial banks around the establishment of a Section 20 subsidiary. We find that, in the three years after the establishment of a Section 20 subsidiary, bank matched adjusted operating pretax cash flow performance increases significantly relative to both non-Section 20 banks and investment banks. The source of the improved performance appears to be revenues generated from the nonbanking activities rather than changes in the traditional commercial banking activities. Further, industry-adjusted risk measures for the sample banks do not change significantly. From these results, it appears that the initial alliances of commercial banks and investment banks via the establishment of Section 20 subsidiaries have been beneficial to the performance of commercial banks. The changes in regulations allowing commercial banks to diversify their activities into investment banking have resulted in increased performance relative to the risk being undertaken.

Appendix: Sample of Bank Holding Companies in the Study and Their First Section 20 Subsidiary That Was Approved by the Federal Reserve for Securities Underwriting

This Appendix provides the list of bank holding companies (BHCs) used in the study. The list of BHCs whose Section 20 subsidiaries are approved for securities underwriting is available at the website of the Board of Governors of the Federal Reserve System (<http://www.federalreserve.gov/generalinfo/section20/>). BHCs may have more than one Section 20 subsidiary that may have been approved during different years. The sample is constructed by eliminating foreign BHCs from the list. For the remaining BHCs, if more than one Section 20 subsidiary existed by December 1999, the sample was constructed by choosing the first Section 20 that was approved by the Federal Reserve. The *Federal Reserve Bulletins* were used to authenticate the dates upon which approvals became effective.

Bank Holding Company	Section 20 Subsidiary
Banc One Corp.	Banc One Capital Corp.
Bank of Boston Corp.	BancBoston Securities, Inc.
Bank of New England Corp.	BNE Capital Market Company

Bank Holding Company	Section 20 Subsidiary
Bank of New York Co., Inc., The	BNY Capital Markets, Inc.
Bank South Corp.	Bank South Securities Corp.
BankAmerica Corp.	Banc of America Securities LLC
Bankers Trust New York Corp.	BT Securities Corp.
Barnett Banks, Inc.	Barnett Capital Markets Group, Inc.
BB&T Corp.	Craigie Corp.
BOK Financial Corp.	Alliance Securities Corp.
Chase Manhattan Corp., The	Chase Manhattan Securities Inc.
Chemical New York Corp.	Chemical Securities, Inc.
Citicorp	Citicorp Securities, Inc.
Commerce Bancorp, Inc.	A. H. Williams & Co.
CoreStates Financial Corp.	CoreStates Securities Corp.
Crestar Financial Corp.	Crestar Securities Corp.
Dauphin Deposit Corp.	Hopper, Soliday & Co., Inc.
First Chicago Corp.	First Chicago Capital Markets, Inc.
First Interstate Bancorp	First Interstate Capital Markets, Inc.
First of America Bank Corp.	First of America Securities, Inc.
First Union Corp.	First Union Securities, Inc.
Fleet/Norstar Financial Group, Inc.	Adams, McEntree & Co., Inc.
Huntington Bancshares Inc.	Huntington Company, The
J.P. Morgan & Co., Inc.	J.P. Morgan Securities, Inc.
Key Corp	Key Capital Markets, Inc.
Liberty National Bancorp, Inc.	Banker's Investment Group
Manufacturers Hanover Corp.	Manufacturers Hanover Securities Corp.
Marine Midland Banks, Inc.	Marine Midland Capital Markets Corp.
Mellon Bank Corp.	Mellon Financial Markets, Inc.
National City Corp.	National City Investments Corp.
NCNB Corp.	NCNB Capital Markets
Norwest Corp.	Norwest Investment Services, Inc.
PNC Financial Corp.	PNC Investment Co.
Republic New York Corp.	Republic New York Securities Corp.
Security Pacific Corp.	Security Pacific Securities, Inc.
SouthTrust Corp.	SouthTrust Securities, Inc.
Sovran Financial Corp.	Sovran Investment Corp.
SunTrust Banks, Inc.	SunTrust Capital Markets, Inc.
Synovus Financial Corp.	Synovus Securities Inc.
U.S. Bancorp	U.S. Bancorp Investments, Inc.

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