

# **IS UNIVERSAL BANKING WORTHWHILE? EVIDENCE FROM BANKS IN THE SECURITIES BUSINESS PRE- AND POST-GLBA**

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## Abstract

We explore whether an economically significant differential exists in market-based risk and return between universal banks—banking organizations with investment banking subsidiaries—and traditional banks. We study market returns between 1990 and 2005, a period of gradual deregulation culminating in passage of the Gramm-Leach-Bliley Act (GLBA) of 1999, which allowed financial holding companies to participate freely in investment banking activities. We find that prior to the GLBA, universal banks had higher return, but the increase in risk more than offsets the return, resulting in a lower risk-adjusted return. In the post-GLBA period, universal banks exhibit lower risk and higher risk-adjusted return, particularly at banks with a greater degree of involvement in securities operations. These results suggest that the legislation has improved the risk-return tradeoff for universal banks. However, other activities of universal banks unrelated to investment banking may also contribute to changes in their risk and return.

*JEL Classifications: G21, G24, G28*

## I. Introduction

Historically, regulatory barriers and restrictions governing the operations of U.S. commercial banks prohibited banks from expanding their operations into securities activities. Specifically, Section 20 of the Glass-Steagall Act of 1933 expressly prohibited banks from any affiliations with organizations engaged in the underwriting, sale, or distribution of stocks, bonds, debentures, notes, or other securities.<sup>1</sup> The regulation was driven by a concern about the inherent riskiness of these activities and the potential negative spillover effects on the overall safety and soundness of the banking system. The Act did classify some securities activities as “bank eligible,” including the underwriting and dealing in general obligations, municipal revenue bonds, and U.S. government bonds; however, most securities activities were “bank ineligible.”<sup>2</sup>

Over the last two decades, the regulatory barriers gradually disappeared. In 1987 the Federal Reserve (Fed) authorized BHCs to establish so-called Section 20 subsidiaries, which could underwrite a small number of previously ineligible corporate debt securities up to a five percent revenue limit.<sup>3</sup> In 1989, the Fed granted permission for Section 20 subsidiaries to underwrite and deal in all debt and equity securities, and it raised the revenue limit to 10 percent. In 1997 the Fed raised the revenue limit again to 25 percent. Responding to intense pressure from the financial services industry, Congress passed in 1999 the Gramm-Leach-Bliley Act (GLBA), also known as the Financial Services Modernization Act. This Act allowed BHCs to

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<sup>1</sup> The Banking Act of 1933, commonly referred to as the Glass-Steagall Act, 48 Stat. 162, is codified at various sections of Title 12 of the United States Code, as amended, 12 U.S.C. §§ 24 (Seventh). Section 20 of the act required member banks to eliminate any affiliations with organizations “engaged principally in the issue, flotation, underwriting, public sale, or distribution at wholesale or retail or through syndicate participation of stock, bonds, debentures, notes, or other securities.” (12 U.S.C. § 377).

<sup>2</sup> Section 16 of the Glass-Steagall Act classified certain securities as “bank-eligible” (12 U.S.C. §§ 24 (Seventh)).

<sup>3</sup> The revenue limit specified that no more than 5 percent of the subsidiaries’ gross revenue could come from previously bank ineligible activities.

convert to financial holding companies (FHCs) and conduct securities activities without limit in subsidiaries separate from their commercial banks.

In theory, the combined production of commercial banking and investment banking could enhance or hurt a BHC's risk and return. On the one hand, universal banks potentially achieve revenue and cost economies by providing both services. These economies accrue if a BHC can use its lending relationship with a firm both to attract its investment banking business and to underprice competitors because the BHC need not duplicate the costly process of evaluating the firm's credit-worthiness. One recent study finds evidence of these synergies. Yasuda (2005) shows that firms with previous bank relationships are more likely to choose that BHC as their underwriter. In addition, universal banks offer significant fee discounts to those firms that also have lending relationships with the commercial bank. In addition to revenue and cost synergies, universal banks accrue risk-reduction benefits from diversification as long as the two activities are not perfectly correlated.

On the other hand, commercial bank expansion into securities activities may increase a BHC's overall risk while hurting (or not improving) its return. If the marginal risk of the securities activities is high enough, it will offset any diversification benefits, resulting in higher overall risk of the BHC. Indeed, Stiroh (2004) and Stiroh and Rumble (2006) find that bank activities that generate significant noninterest income (which includes a much wider array of activities than investment banking) are far riskier than interest income activities, and the increased risk more than offsets the diversification benefits. Moreover, their risk-adjusted returns are no better than the risk-adjusted returns at more traditional commercial banks that rely primarily on interest income activities.

Like the theory, the empirical evidence on universal banking is mixed. Because U.S. regulations banned universal banking until recently, a majority of empirical studies use simulations or hypothetical mergers to create synthetic universal banks. Wall and Eisenbeis (1984) find that between 1970 and 1980 the correlation between bank earnings and security broker/dealer earnings was negative, indicating potential gains from diversification. However, Boyd and Graham (1988) and Boyd, Graham, and Hewitt (1993) simulate mergers between bank holding companies and securities firms and conclude that such mergers would likely increase bankruptcy risk. Allen and Jagtiani (2000) use a similar methodology and find that diversification benefits are not sufficiently large to justify expanding bank powers into securities activities.

Simulation studies, however, fail to capture potential synergies from a firm's endogenous response to a real merger. Yet the few studies that analyze the risk and/or return from recent experiences with universal banking also fail to find significant benefits. Kwan (1998) studies domestic BHCs with Section 20 subsidiaries from 1990 through 1997 and finds that Section 20 subsidiaries typically posted more volatile accounting returns than commercial banking subsidiaries, though returns were not necessarily higher. Rime and Stiroh (2003) analyze the performance of universal banks in Switzerland and conclude that Swiss universal banks have large cost and profit inefficiencies, and the banks do not appear to benefit from broader product mixes. Yeager, Yeager and Harshman (2006) examine accounting ratios at FHCs in the post-GLBA era and find that investment banking had no discernable effect on profitability or revenue productivity. Their study, however, does not address risk effects specifically nor does it account for any profitability gains that universal banks might have achieved in the pre-GLBA era.

Finally, Cornett, Ors, and Tehranian (2002), find that BHCs that established Section 20 subsidiaries enhanced their cash flows with no significant change in bank risk.

Another strand of the literature conducts event studies around legislation that relaxed the Glass-Steagall restrictions. This evidence mostly suggests that markets expected large banking organizations to fare well from universal banking. Cyree (2000) and Narayanan, Rangan and Sundaram (2002) study the market reaction to the 1996 Federal Reserve Board announcement that increased to 25 percent the permissible revenue limit that Section 20 BHCs could earn from previously ineligible securities activities. Both studies find that BHCs, especially large BHCs with Section 20 subsidiaries, had positive and significant abnormal returns following this announcement. Bhargava and Fraser (1998) study the market response to four Federal Reserve Board decisions to allow bank holding companies to engage in investment banking through Section 20 subsidiaries. They also find positive abnormal returns for commercial banks from the initial powers granted by the Federal Reserve, but subsequent expansions of these powers produced negative abnormal returns. Carow and Heron (2002) and Hendershott, Lee and Tompkins (2002) find that the stock prices of both small and large banks were unaffected by the passage of the GLBA, presumably because the major benefits to banks from product-line diversification were already impounded into bank stock prices before passage of the legislation. On the other hand, Akhigbe and Whyte (2001), Al Mamun, Hassan, and Van Son Lai (2004), and Al Mamun, Hassan, and Maroney (2005) find positive abnormal returns for BHCs, with large banks benefiting the most. In sum, event studies suggest that markets expected the largest BHCs to benefit from the reemergence of universal banking.

This paper uses market data between 1990 and 2005 to measure risk and return to bank and financial holding companies engaged in universal banking. Our methodology improves

upon existing literature in three ways. First, our sample period covers a longer time period than previous studies, and it includes data from the pre-GLBA and post-GLBA periods. The long time period is beneficial because the costs and benefits to universal banking are likely to be more apparent in the long run. Researchers and policymakers are interested in whether or not the GLBA had a significant effect on bank performance or whether the Act was a non-event due to earlier deregulation. This paper provides insights into this question. For the pre-GLBA (1990 to 1999) period, we draw upon confidential data from the Federal Reserve that tracked the securities activities of Section 20 firms prior to implementation of the GLBA. For the post-GLBA period (2000-2005) we utilize the publicly available FHC regulatory reports.

A second contribution is that our methodology avoids any bias from simulation methods by evaluating the risk and return of banking organizations that actually engaged in securities activities. Third, our approach goes beyond event studies because such studies, while important, capture market ex-ante expectations at the time of the event. In contrast, our study measures ex-post changes to risk and return from banks engaged in universal banking.

We choose to use market data instead of accounting data to derive our measures of risk and return. Although both sources provide useful insights, market data are less likely to be affected by the firm's choice of accounting methods. In addition, market data allow us to compute total, systematic, and unsystematic risk. While regulators and undiversified investors are concerned with total risk, diversified market participants consider systematic risk a more relevant risk measure that can be used in the risk-adjusted cost of capital calculations.

We find that over the full sample period, universal banks have higher total and idiosyncratic risk, lower systematic risk, and higher returns. The lower systematic risk and higher returns derive primarily from the post-GLBA period, suggesting that the legislation has

improved the risk-return tradeoff for universal banks. However, the correlation between risk and return, on the one hand, and concrete measures of investment banking activity is weak, suggesting that universal banks may also engage in other activities unrelated to investment banking that substantially alter risk and return.

The next section discusses variable definitions and data sources. Section 3 reviews the methodology and results. Section 4 concludes.

## II. Variable Definitions and Data Sources

The key measure of return is return on equity, derived from returns from the Center for Research in Security Prices (CRSP) data for all publicly-traded bank and financial holding companies between 1990 and 2005.<sup>4</sup> Daily returns are aggregated over each week, and annual bank-year observations are obtained by averaging these weekly observations.

Total risk is calculated as the variance of weekly equity returns for each bank  $i$  in year  $t$ , denoted as  $\sigma_{it}^2$ . Systematic risk is estimated using the capital asset pricing model (CAPM) developed by Sharpe (1964), Lintner (1965), and Black (1972). CAPM defines the systematic risk of a security in terms of the market risk factor, beta, and quantifies the tradeoff between risk of a security and its return. The CAPM is estimated separately for each bank where the CRSP record is available to derive estimates of systematic and unsystematic risk using the following OLS model:

$$R_{iw} = \alpha_{it} + \beta_{mit} R_{mw} + \beta_{fit} R_{fw} + \varepsilon_{iw} \quad (1)$$

where  $R_{iw}$  is the bank equity return (all subscripts  $w$  denote weekly frequency);  $R_{mw}$  is the return on the market portfolio;  $R_{fw}$  is the yield on a three-months Treasury bill;  $\beta_{mit}$  measures the

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<sup>4</sup> CRSP adjusts price data for stock split events, dividends, and other distributions (CRSP Support Documentation, 2006).

systematic risk of security  $i$  in year  $t$ ; and  $\varepsilon_{it}$  captures the regression residuals. Unsystematic risk is measured by the variance of the regression residuals from this model. Market returns are calculated using the value-weighted market returns from the NYSE, AMEX, or NASDAQ index. Similar to bank stock returns, weekly market returns are calculated as cumulative daily returns.

In addition to obtaining equity market returns, total risk, and systematic risk for each bank and financial holding company, we compute two measures of risk-adjusted return. The return is adjusted for total and systematic risk by dividing equity return by  $\sigma_i$  and the market beta, respectively.  $ROE/\sigma$  is a measure of return per unit of total risk, while  $ROE/\beta$  is a measure of return per unit of systematic risk. The former measure is most relevant to bank supervisors and undiversified investors, who care about a BHC's total risk. The latter measure is most relevant for diversified investors.

We match the results of the market model estimations with the accounting data from the Federal Reserve Y-9C reports, Consolidated Financial Statements for Bank Holding Companies. During our sample period, the Y-9C was filed quarterly by each BHC with at least \$150 billion in consolidated assets. We include data from only top-tier organizations to avoid multiple counting of activities of parent companies and their subsidiaries. Quarterly balance sheet data are averaged over a year while the income data include income earned through the full year. The final sample includes 6035 bank-year observations for 771 distinct banks that have data both from CRSP and the Y-9C reports between 1990 and 2005.

Our BHC sample is divided into two groups: those that participated in securities underwriting activities and those that did not. The data sources changed pre- and post-GLBA, and we try to achieve consistent measures of securities activities across the sample periods. Between 1990 and 2000, the BHCs that underwrote securities did so using Section 20

subsidiaries. Data for their securities activities come from the Federal Reserve's FR Y-20, the mandatory and confidential report titled "Financial Statements for a Bank Holding Company Subsidiary Engaged in Bank-Ineligible Securities Underwriting and Dealing."<sup>5</sup> After implementation of the GLBA in March 2000, BHCs involved in securities underwriting could convert to financial holding companies (FHCs) and conduct investment banking activities without restriction. Consequently, FHCs no longer needed to file the FR Y-20. Our post-GLBA measures of securities activities come from the Y-9C and its supplement in the years 2000 and 2001, the Y-9CS.

Using the respective data source, we construct four measures of securities underwriting activities. The first measure is a dummy variable to indicate investment banking (IB) activity. IB is equal to one in the pre-GLBA era if the firm filed the FR Y-20 report in a given year, and zero otherwise. In the post-GLBA era, IB is equal to one if the BHC converted to a FHC *and* had Section 20 subsidiaries prior to 2000. We analyze only the FHCs with prior Section 20 subsidiaries (which we call Section 20 FHCs) because, on average, the FHCs that began to underwrite securities after 2000 are small and conduct little investment banking activity. This restriction gives us a representative sample of BHCs engaged in securities activities. The second measure is the ratio of Section 20 assets (pre-GLBA) or broker-dealer subsidiary assets (post-GLBA) to total assets. Third, we compute the ratio of Section 20 net income to total operating income of the BHC. Section 20 net income includes net revenue from interest income and fee income related to the subsidiary's securities activities. This ratio, however, cannot be computed in the post-GLBA era because firms no longer submitted the Y-20. The fourth and final measure of securities activity is the ratio of investment banking fee income to total operating income. We

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<sup>5</sup> The analysis conducted in this paper preserves confidentiality of individual reports by aggregating data from the FR Y-20 reports.

compute this ratio for the pre-GLBA era by summing only the fee income from section 20 operations, and dividing by the operating income of the entire firm.<sup>6</sup> The similar post-GLBA ratio comes from the Y-9C, which reports investment banking, advisory, brokerage, and underwriting fees and commissions.

Table 1 provides summary statistics of securities activities, risk and return for various samples and time periods between 1990 and 2005. Several interesting trends emerge from the data. First, BHCs and FHCs involved in securities underwriting are large relative to other BHCs. Over the full sample period, the average total assets of securities-underwriting banks is \$113.5 billion compared with \$3.2 billion for other banks. Investment banking assets increased from an average of \$8.1 billion in the 1990s to \$18.5 billion for Section 20 FHCs in the post-GLBA period. The ratio of investment banking assets to total assets, however, fell by nearly half to 2.4 percent in the post-GLBA period relative to the 1990s primarily because some FHCs grew rapidly by acquiring insurance companies and merging with large traditional banks.

On average, BHCs that underwrite securities produce lower returns and have lower total and idiosyncratic risk but higher market risk. The average weekly equity return for BHCs with securities activities is 0.35 percent (19.9 percent annualized) while the average return for BHCs without these activities is 0.4 percent (23.1 percent annualized). This difference is not statistically significant. Risk differences, however, are economically and statistically significant. The average total risk of BHCs with securities activities is 0.17 percent compared to about 0.20 percent for BHCs without these activities, and the unsystematic risk is 0.12 percent versus 0.18 percent, respectively. In contrast, the average beta coefficient for the securities underwriters is 1.05 compared with 0.4 for non-securities banks. Risk-adjusted return for the undiversified

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<sup>6</sup> The specific items summed are commissions on securities transactions, profit or losses from securities underwriting, fees on private placements, and fees for investment advisory, financial advice, or other services.

investor (ROE/total risk) is slightly higher at IB BHCs than at other BHCs in the 1990s, though the opposite is true for the full sample period.

### III. Methodology and Results

The primary goal of this study is to investigate the effect of securities underwriting activities on the risk and performance of bank and financial holding companies. The basic empirical specification is the ordinary-least-squares regression model that uses bank-year observations for publicly traded banks between 1990 and 2005.<sup>7</sup> Tables 2 through 6 report results corrected for heteroskedasticity that capture unobserved heterogeneity that may arise if certain banks are more likely to participate in securities activities. All regressions include year and state dummies to capture common economic shocks.

The model is written as:

$$Risk(or\ Return)_{it} = \alpha + \beta \cdot InvBank_{it} + \chi \cdot Nonint/TA_{it} + \delta \cdot Loan/TA_{it} + \phi \cdot \ln TA_{it} + \gamma \cdot EQ/AA_{it} + State + Year + \varepsilon_{it} \quad (2)$$

where risk variables are total risk, systematic risk and unsystematic risk as defined above, the return measures are the equity market return and the two measures of risk-adjusted returns for diversified and undiversified investors. *InvBank* is a variable that takes on one of three values depending on the model. In model 1, *InvBank* is a dummy variable that equals one if a bank has a Section 20 subsidiary at any time during the sample period. In model 2, *InvBank* is the measure of bank involvement in securities activities defined as the ratio of investment banking assets to total BHC or FHC consolidated assets. In model 3, *InvBank* is the ratio of income from securities underwriting activities to total operating income of the parent company. For the 1990 to 1999 period, model 3 uses investment banking income as the numerator of *InvBank*; for the

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<sup>7</sup> Time-series cross-section estimations and maximum likelihood estimations that use Heckman correction were also performed but revealed very similar results.

full sample and the 2000-2005 period, model 3 uses investment banking fee income as the numerator of *InvBank*.

Control variables include the ratio of other noninterest income (total noninterest income minus income from securities activities) to total operating income.<sup>8</sup> This ratio captures the effect of greater reliance on noninterest sources of revenue on bank risk and return. Recent studies by Stiroh (2004) and Stiroh and Rumble (2006) find that increased involvement in noninterest activities results in more volatile but not necessarily more profitable bank performance. A second control variable is the ratio of loans to total assets to proxy for the degree to which a bank is involved in traditional banking activities, such as loan making. If a bank shifts toward nontraditional activities, such as securities underwriting, we would expect this ratio to decrease. We control for bank size and capital levels by adding the logarithm of total assets and the ratio of equity to assets. Research into the relationship between bank size, diversification, and risk, shows that larger banks, although better diversified, on average take greater risks than smaller banks. They counterbalance their diversification advantage by pursuing risk-enhancing activities, such as commercial and industrial lending and trading activities, and operating with less capital (Demsetz and Strahan, 1997).

Tables 2 through 6 present results of estimation of equation (2). For each table, panel A reports the three risk regressions (total risk, systematic risk, and unsystematic risk) while Panel B reports the three return measures (equity market returns, return adjusted for total risk, and return adjusted for beta).

Results for the full sample in Panel A of Table 2 indicate that the joint production of investment banking and commercial banking services is correlated with higher total and

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<sup>8</sup> Again, for consistency, we subtract total section 20 subsidiary income from noninterest income for the 1990s samples, and we subtract investment banking fee income from noninterest income for the full sample and the 2000-2005 periods.

unsystematic risk but lower systematic risk. The IB dummy coefficient in model I is positive and statistically significant when regressed against total and unsystematic risk, but it is negative and statistically significant when regressed against systematic risk. With one exception, the coefficients for the two other measures of investment banking activity—IB assets to total assets and IB fee income to operating income—are close to zero and statistically insignificant. The exception is the negative and statistically significant coefficient on investment banking assets to total assets when regressed against systematic risk. One reason for this discrepancy between the IB dummy coefficients and the other measures of IB activity could be because prior to the GLBA, which effectively removed regulatory barriers between commercial and investment banking activities, markets perceived securities underwriting by BHCs as more risky regardless of their degree of involvement in these activities. However, statistical significance of the ratio of IB assets to total assets improves in the post-GLBA period. Another explanation may be that banking firms that engage in investment banking activity are also involved in other activities that influence their risk patterns. Consequently, the regressions may suffer from omitted variable bias. Total and unsystematic risk are also positively associated with the bank's noninterest income share (less IB fee income), suggesting that a greater reliance on noninterest income leads to more volatile returns. The number of years in the securities business is negatively associated with all risk measures, suggesting that as banks gain valuable experience in securities activities, their risk decreases. Total and unsystematic risk also decrease with bank size and capital levels. The coefficient on systematic risk is negative for higher loans-to-assets ratio, indicating that the beta coefficient is lower for BHCs concentrating on the traditional bank business. Bank size, however, is positively associated with systematic risk in all three models.

Panel B of Table 2 reports the full-sample results for bank profitability. The IB dummy coefficient in Model 1 is positive and statistically significant, showing that banks that jointly produce commercial banking and investment banking services earn higher returns. The risk-adjusted returns are negative, however, indicating that the additional risk more than offsets the additional return. The investment banking asset to total asset coefficients in the return regression for model II are positive and statistically significant, suggesting that banks with more investment banking assets are more profitable than other banks. The results for investment banking fee income in model III, however are statistically insignificant and/or close to zero. Once again, the discrepancy between model I and models II and III suggest that banking organizations that jointly produce commercial banking and investment banking might have characteristics besides their securities underwriting activities that influence return. The coefficients on noninterest income in Panel B indicate a negative relationship between noninterest income and risk-adjusted returns, though most of the coefficients are not statistically significant. This relationship is consistent with that found in Stiroh and Rumble (2006).

To summarize, the model I results for the entire sample period indicate that banks that participate in securities activities have higher total risk and unsystematic risk but lower market risk. The return is also higher, but not sufficiently higher to offset the increase in risk. The model II and III evidence suggests, however, that investment banking activities may not be driving these results. Banks involved in securities activities may be involved in other activities that affect their risk and return.

Tables 3 through 5 show the regression results for the 1990 to 1999 pre-GLBA period, the 1990 to 1994 period, and the 1995 to 1999 period, respectively. BHC investment banking activity in this decade was conducted entirely through section 20 subsidiaries. The key risk

results for the 1990s reported in Panel A of Table 3 are similar to the full sample period results with two exceptions. First, the IB dummy coefficient in model I is positive and statistically significant in all three risk regressions. That is, BHCs engaged in investment banking activity during the 1990s have higher total, systematic, and unsystematic risk. In contrast, systematic risk decreases in model I over the full sample period. The second difference is that the negative and statistically significant relationship between investment banking assets and systematic risk observed in the full sample disappears. Instead, investment banking income is statistically and positively correlated with systematic risk. Model I results in Panel B of Table 3 show the same pattern as the full sample results. That is, BHCs that produce investment banking services have higher market returns, but the increase in risk more than offsets the return, resulting in a lower risk-adjusted return. Return coefficients for the other models are statistically insignificant. Finally, though noninterest income (minus investment banking income) is not statistically correlated with the three risk measures, but higher levels of noninterest income lead to lower risk-adjusted returns. In sum, the differences in results between model I and models II and III remain, consistent once again with omitted variable bias.

Table 6 results from the post-GLBA sample period are noticeably different from the pre-GLBA period. Investment banking activity in this period was carried out by FHCs. The IB dummy in model 1 takes a value of one if the banking organization is an FHC and it previously had a Section 20 subsidiary; otherwise, the IB dummy equals zero. Like the full sample results, the IB dummy variable in Panel A of Table 6 is positively correlated with total and unsystematic risk, but negatively correlated with systematic risk. The positive correlation with total and unsystematic risk, however, is not statistically significant. Only the negative correlation with systematic risk is significant, suggesting that FHCs are more diversified than BHCs, and that

diversification reduces FHC exposure to market risk. In model II, FHCs with a greater intensity of securities operations as measured by investment banking assets to total assets, exhibit lower total, systematic, and unsystematic risk, though the coefficients on total and unsystematic risk are close to zero. Similar to the full sample results, banks size, capital levels, and the number of years in the securities business are negatively associated with total and unsystematic risk. However, systematic risk appears to increase at larger and better capitalized banks. The coefficients on investment banking fee income in model III are statistically insignificant. Panel B of Table 6 reveals that investment banking assets in model II are positive and statistically significant when regressed against return and risk-adjusted return. The model I and model III coefficients are statistically insignificant.

#### **IV. Conclusion**

We have examined the correlation between risk and return and various measures of investment banking activity between 1990 and 2005. Our long sample period allows us to track the impact of investment banking activity on equity measures of risk and return pre- and post-GLBA. We find that universal banks generally have higher total and idiosyncratic risk, but lower systematic risk. The decline in systematic risk comes in the post-GLBA era, suggesting that the new GLBA has had a notable effect on bank risk. Returns for such banks are somewhat higher than returns for banks not engaged in investment banking; however, the risk-adjusted returns depend on the sample period.

Despite these results, the correlation between risk and return, on the one hand, and concrete measures of investment banking activity as measured by firms' investment banking assets and investment banking income, is weak. This discrepancy is consistent with omitted

variable bias. That is, universal banks may also engage in other risky activities that substantially alter risk and return. Investment banking activities seem to have little overall influence on bank risk and return, though the influence is stronger in the post-GLBA era. One possible omitted variable is a firm's trading account activities. More research is needed to examine the effect that trading activities have on risk and return.

## References

- Akhigbe, Aigbe, and Ann M. Whyte (2001.) The Market's Assessment of the Financial Services Modernization Act of 1999. *Financial Review* 36: 119-138.
- Akhigbe, Aigbe and Ann Marie Whyte (2004.) The Gramm-Leach-Bliley Act of 1999: Risk Implications for the Financial Services Industry. *The Journal of Financial Research* 27(3): 435-446.
- Al Mamun, Abdullah, M. K. Hassan, and Neal Maroney (2005.) The Wealth and Risk Effects of the Gramm-Leach-Bliley Act (GLBA) on the US Banking Industry. *Journal of Business Finance & Accounting* 32: 351-388.
- Al Mamun, Abdullah, M. Kabir Hassan, and Van Son Lai (2004.) The Impact of the Gramm-Leach-Bliley Act on the Financial Services Industry. *Journal of Economics and Finance* 28(3): 333-347.
- Allen, L. and J. Jagtiani. (2000). "The Risk Effects of Combining Banking, Securities, and Insurance Activities," *Journal of Economics and Business* 52:485-497.
- Avery, R. and A. Berger. (1988). "Risk-based capital and off-balance sheet activities." *Board of Governors of the Federal Reserve System, Finance and Economics Discussion Series*, 35.
- Benston, G. and G. Kaufman. (1995). "Commercial banking and securities activities: A survey of the risks and returns." *Prepared for ABA Securities Association*.
- Bhargava, R. and D. Fraser. (1998). "On the wealth and risk effects of commercial bank expansion into securities underwriting: An analysis of Section 20 subsidiaries." *Journal of Banking and Finance* 22, 447-465.
- Black, F. (1972). "Capital market equilibrium with restricted borrowing." *Journal of Business* 45, 444-54.
- Boyd, J. and S. Graham. (1988). "The profitability and risk effects of allowing bank holding companies to merge with other financial firms: A simulation study." *Federal Reserve Bank of Minneapolis, Quarterly Review*.
- Boyd, J., S. Graham, and R. Hewitt. (1993). "Bank holding company mergers with non-bank financial firms: Effects on the risk of failure." *Journal of Banking and Finance* 17, 43-63.
- Boyd, J., G. Hanweck, and P. Pithyachariyakul. (1980). "Bank holding company diversification." *Proceedings of a Conference on Bank Structure and Competition, Federal Reserve Bank of Chicago*, 105-121.
- Boyd, J. and P. Pithyachariyakul. (1981). "Bank holding company diversification into nonbank lines of Business." Manuscript.

- Campbell, J., A. Lo, and A. MacKinlay. (1997). *The Econometrics of Financial Market*. Princeton University Press, Princeton, New Jersey.
- Carow, Kenneth and Randall Heron (2002.) Capital Market Reactions to the Passage of the Financial Services Modernization Act of 1999. *Quarterly Review of Economics and Finance* 42: 465-485.
- Cornett, M., E. Ors, and H. Tehranian. (2002). "Bank performance around the introduction of a Section 20 subsidiary." *The Journal of Finance* 57, 1, 501-523.
- Cyree, Ken (2000.) The Erosion of the Glass-Steagall Act: Winners and Losers in the Banking Industry. *Journal of Economics and Business* 52: 343-363.
- Demsetz, R. and P. Strahan. (1995a). "Diversification, size, and risk at bank holding companies." *Research Paper No. 9506, Federal Reserve Bank of New York*.
- Demsetz, R. and P. Strahan. (1995b). "Historical patterns and recent changes in the relationship between bank holding company size and risk." *Federal Reserve Bank of New York, Economic Policy Review* 1/2, 13-26.
- Green, E., J. Lopez, and Z. Wang. (2003). "The Federal Reserve Bank's imputed cost of equity capital." *New York Fed Economic Policy Review* 9, 3.
- Hendershott, Robert J., Darrell E. Lee, and James G. Tompkins (2002.) Winners and Losers as Financial Service Providers Converge: Evidence from the Financial Modernization Act of 1999. *The Financial Review* 37: 53-72.
- Kandel, S. and R. Stambaugh. (1987). "On correlations and inferences about mean-variance efficiency." *Journal of Financial Economics* 18, 61-90.
- Keeley, M. (1990). "Deposit insurance, risk, and market power." *American Economic Review*, 80, 5, 1183-1200.
- Kwan, S. (1998). "Securities activities by commercial banking firms' Section 20 subsidiaries: Risk, return, and diversification benefits." *Federal Reserve Bank of San Francisco Working Paper 98-10*.
- Kwan, S. and R. Eisenbeis. (1995). "An analysis of inefficiencies in banking." *Journal of Banking and Finance* 19, 3-4, 733-734.
- Kwast, M. (1989). "The impact of underwriting and dealing on bank returns and Risk." *Journal of Banking and Finance* 13, 1, 101-125.
- Lintner, J. (1965). "The valuation of risk assets and the selection of risky investments in stock portfolios and capital budgets." *Review of Economics and Statistics* 47, 13-37.

- Narayanan, Rajesh P., Nanda K. Rangan, and Sridhar Sundaram (2002.) Welfare Effects of Expanding Banking Organization Opportunities in the Securities Arena. *Quarterly Review of Economics and Finance* 42: 505-527.
- Petersen, M. and R. Rajan. (1994). "The benefits of lending relationships: Evidence from small business data." *The Journal of Finance* 49, 1, 3-37.
- Rime, Bertrand, and Kevin J. Stiroh (2003.) The Performance of Universal Banks: Evidence from Switzerland, *Journal of Banking and Finance* 27: 2121-2150.
- Santos, J. A. C. (1998). "Commercial banks in the securities business: A review." *Journal of Financial Services Research* 14, 1, 35-60.
- Saunders, A. and I. Walter. (1994). *Universal Banking in the U.S.* New York: Oxford University Press.
- Saunders, A. and I. Walter. (1996). *Universal Banking: Financial System Design Reconsidered.* Irwin.
- Shanken, J. (1987). "Multivariate proxies and asset pricing relations: Living with the Roll Critique." *Journal of Financial Economics* 18, 91-110.
- Sharpe, W. (1964). "Capital asset prices: A theory of market equilibrium under conditions of risk." *The Journal of Finance* 19, 425-442.
- Stambaugh, R. (1982). "On the exclusion of assets from tests of the two parameters Model." *Journal of Financial Economics* 10, 235-268.
- Stiroh, Kevin J. (2004). "Diversification in Banking: Is Noninterest Income the Answer?" *Journal of Money, Credit, and Banking*, Vol. 36, No. 5.
- Stiroh, Kevin J. and Adrienne Rumble. (2006). "The dark side of diversification: The case of US financial holding companies," *Journal of Banking & Finance* 30 2131–2161.
- Wall, L. and R. Eisenbeis. (1984). "Risk considerations in deregulating bank Activities." *Federal Reserve Bank of Atlanta, Economic Review*, 6-19.
- Yasuda, Ayako (2005). "Do Bank Relationships Affect the Firm's Underwriter Choice in the Corporate-Bond Underwriting Market?" *Journal of Finance* v60, n3 (June 2005): 1259-92.
- Yeager, Timothy J., Fred C. Yeager, and Ellen Harshman. (2006) ""The Financial Services Modernization Act: Evolution or Revolution," *Journal of Economic and Business*, forthcoming.

**Table 1 Sample Descriptive Statistics**

This table lists means of various ratios for all BHCs with and without Section 20 subsidiaries. We include data from only top-tier organizations to avoid multiple counting of activities of parent companies and their subsidiaries. Quarterly balance sheet data are averaged over a year while the income data include income earned through the full year. The final sample includes 6035 bank-year observations for 771 distinct banks that have data both from CRSP and the Y-9C reports between 1990 and 2005. Daily returns (ROE) are aggregated over each week, and annual bank-year observations are obtained by averaging these weekly observations. Total risk is calculated as the variance of weekly equity returns for each bank  $i$  in year  $t$ ; systematic risk is estimated using Equation (1), and unsystematic risk is captured by the variance of residuals from the market model in Equation (1).

Weekly averages	1990-2005		1990-1999		1990-1994	1995-1999	2000-2005		
	IB BHCs	Other BHCs	IB BHCs	Other BHCs	IB BHCs	IB BHCs	S20 FHCs	Non-S20 FHCs	BHCs
Total assets (\$bil.)	114.4 (200.8)	3.3 (8.1)	71 (93.4)	3.1 (6.7)	47.9 (51.2)	98.5 (121.1)	229.7 (324.4)	5.5 (10.5)	2.5 (6.2)
Average equity (\$bil)	8.94 (15.9)	0.29 (0.78)	5.17 (6.7)	0.25 (0.6)	3.3 (3.5)	7.39 (8.68)	18.9 (25.8)	0.49 (0.99)	0.25 (0.85)
IB assets (\$bil)	11.9 (38.8)		8.13 (19.2)		4.6 (8)	10.8 (24.1)	18.5 (57.8)	0.01 (0.16)	
IB assets/TA (%)	3.7 (6.6)		4.6 (7.3)		4.6 (7.4)	4.67 (7.35)	2.4 (5.1)	0.03 (0.2)	
Trading Assets/TA (%)	5.6 (12.7)	0.33 (2.7)	6.65 (14.5)	0.51 (3.5)	6.2 (14.6)	7.18 (14.3)	3.3 (5.9)	0.1 (0.5)	0.06 (0.53)
IB inc to oper inc (%)	1.04 (2.7)		1.04 (2.7)		1.3 (2.5)	0.84 (2.8)			
IB fee income to oper inc (%)	15.7 (28.5)	3.14 (22.8)	7.3 (10.6)		5.91 (7.28)	8.28 (12.36)	32 (42)	3.4 (37.1)	
Trading revenue to oper inc (%)	29.9 (75.9)	1.46 (36.8)	32 (82.3)	1.8 (48.5)	32.1 (68.7)	31.8 (95.5)	26 (59)	2.2 (15)	0.42 (3)
(Nonint inc - IB inc) to oper inc (%)	1.77 (3.5)	1.235 (6.33)	1.85 (4.09)	1.31 (7.36)	2.34 (5.55)	1.3 (0.67)			
(Nonint inc - IB fee income) to oper inc (%)	1.77 (3.5)	1.23 (6.33)	1.85 (4.09)	1.3 (7.36)	2.34 (5.55)	1.3 (0.665)	1.56 (1.43)	1.1 (3.6)	1.15 (5.1)
(Nonint inc - Trading revenue) to oper inc (%)	1.77 (3.5)	1.24 (6.64)	1.80 (4.07)	1.3 (7.8)	2.28 (5.53)	1.26 (0.59)	1.69 (1.45)	1.13 (3.53)	(1.17) (5.12)
Loans to assets (%)	58.7 (16.5)	64.3 (11.4)	59 (15.8)	62 (11)	58.9 (14.36)	59 (17)	57 (18.1)	67 (11)	67 (11.8)
Total risk (variance of weekly market returns in a year) (%)	0.167 (0.216)	0.195 (0.4)	0.173 (0.24)	0.224 (0.5)	0.194 (0.318)	0.148 (0.09)	0.153 (0.13)	0.136 (0.106)	0.162 (0.178)
Systematic risk( $Beta$ )	1.06 (0.45)	0.4 (1.05)	1.15 (0.45)	0.41 (0.75)	1.13 (0.48)	1.167 (0.409)	0.82 (0.37)	0.41 (2.34)	0.38 (0.6)
Unsystematic risk (%)	0.122 (0.19)	0.18 (0.38)	0.128 (0.218)	0.205 (0.48)	0.16 (0.29)	0.09 (0.06)	0.108 (0.11)	0.118 (0.101)	0.144 (0.159)
ROE (%)	0.35 (0.53)	0.4 (0.69)	0.397 (0.58)	0.42 (0.77)	0.289 (0.654)	0.525 (0.447)	0.227 (0.35)	0.38 (0.495)	0.386 (0.523)
ROE/beta (%)	0.48 (1.6)	-2.5 (258)	0.49 (1.8)	-5.1 (335)	0.462 (2.09)	0.53 (1.3)	0.46 (0.96)	3 (69.5)	0.99 (34)
ROE/total risk (%)	3.5 (4.67)	3.61 (7.84)	3.77 (4.9)	3.6 (7.4)	2.15 (3.93)	5.69 (5.28)	2.92 (3.98)	3.7 (4.4)	3.5 (8.5)
N	455	5580	324	3257	176	148	126	677	1624

**Table 2 Bank Risk and Return Regressions: Full Sample (1990-2005)**

OLS regression estimates of model (2) with bank-year observations for publicly traded banks between 1990 and 2005. All results include year and state fixed effects. Panel A uses total, systematic and idiosyncratic risk measures as dependent variables. Panel B uses return (ROE) and two risk-adjusted return measures as dependent variables. Standard errors in parentheses are corrected for heteroskedasticity.

Panel A																		
Dep Variable:	Total risk						Systematic						Unsystematic					
Model:	I	II	III				I	II	III				I	II	III			
Intercept	0.514 *** (0.058)	0.350 *** (0.05)	0.408 *** (0.053)				2.020 *** (0.169)	-1.580 *** (0.377)	-1.710 *** (0.351)				0.560 *** (0.055)	0.368 *** (0.037)	0.430 *** (0.038)			
IB Dummy	0.034 ** (0.014)	----	----				-0.067 ** (0.03)	----	----				0.028 ** (0.013)	----	----			
IB Assets/TA	----	-0.001 (0.0009)	----				----	-0.019 *** (0.004)	----				----	-0.001 (0.001)	----			
IB fee inc/oper inc	----	----	0.000 (0.00019)				----	----	-0.001 (0.0007)				----	----	0.000 (0.0002)			
(Nonint inc-IB fee inc)/oper inc	0.005 * (0.0027)	0.002 * (0.0012)	0.002 (0.002)				0.002 (0.002)	0.001 (0.0021)	0.001 (0.003)				0.005 ** (0.0025)	0.002 ** (0.001)	0.002 (0.002)			
Loans/Assets	-0.053 ** (0.0254)	-0.060 (0.04)	-0.052 (0.038)				-0.162 ** (0.08)	-0.480 *** (0.13)	-0.346 *** (0.12)				-0.040 ** (0.02)	0.000 (0.0003)	-0.023 (0.029)			
log(TA)	-0.014 *** (0.002)	-0.001 (0.0014)	-0.005 *** (0.0014)				-0.190 *** (0.009)	0.178 *** (0.015)	0.178 *** (0.014)				-0.019 *** (0.002)	-0.008 *** (0.001)	-0.012 *** (0.001)			
Equity/assets	-0.760 *** (0.168)	-0.268 * (0.157)	-0.338 ** (0.153)				0.870 (0.75)	4.310 ** (2.04)	3.920 ** (1.71)				-0.730 *** (0.159)	-0.340 *** (0.127)	-0.397 *** (0.123)			
Rsq	0.12	0.16	0.12				0.1	0.07	0.07				0.13	0.18	0.13			
N	5558	2015	2193				5564	2016	2195				5558	2015	2193			

  

Panel B																		
Dep Variable:	ROE						ROE/ $\sigma_E$						ROE/ $\beta$					
Model:	I	II	III				I	II	III				I	II	III			
Intercept	0.480 *** (0.09)	0.270 (0.19)	0.500 *** (0.193)				-2.930 *** (1.13)	0.389 (1.54)	1.040 (2.07)				-15.600 (19.44)	1.180 (10.04)	4.650 (10)			
IB Dummy	0.044 * (0.024)	----	----				-0.500 * (0.29)	----	----				-4.270 (4.47)	----	----			
IB Assets/TA	----	0.008 ** (0.004)	----				----	0.090 ** (0.04)	----				----	0.191 (0.154)	----			
IB fee inc/oper inc	----	----	-0.001 ** (0.0005)				----	----	-0.006 (0.007)				----	----	0.017 (0.016)			
(Nonint inc-IB fee inc)/oper inc	-0.001 (0.001)	-0.004 (0.004)	0.000 (0.002)				-0.030 *** (0.01)	-0.060 * (0.033)	-0.074 (0.075)				-0.034 (0.043)	-0.046 (0.04)	-0.125 (0.12)			
Loans/Assets	0.010 (0.06)	0.300 *** (0.09)	0.250 *** (0.08)				1.060 (0.8)	4.640 *** (1.44)	2.990 ** (1.36)				26.170 (27.2)	9.160 (6.4)	4.050 (5.97)			
log(TA)	-0.039 *** (0.005)	-0.046 *** (0.0058)	-0.054 *** (0.006)				0.046 (0.077)	-0.253 *** (0.089)	-0.214 * (0.111)				1.600 (1.81)	-0.419 (0.569)	-0.460 (0.54)			
Equity/assets	-2.560 *** (0.34)	-2.710 *** (0.63)	-3.300 *** (0.56)				-0.950 (4.33)	-12.200 * (6.83)	-9.340 (7.54)				316.300 (317.3)	-5.740 (39.7)	21.410 (39.7)			
Rsq	0.36	0.26	0.27				0.21	0.15	0.09				0.003	0.005	0.004			
N	5564	2016	2195				5557	2015	2193				5557	2015	2193			

\*, \*\*, \*\*\* statistically significant at the 10%, 5% and 1% levels, respectively

**Table 3 Bank Risk and Return Regressions: Pre-GLBA (1990-1999)**

OLS regression estimates of model (2) with bank-year observations for publicly traded banks between 1990 and 1999. All results include year and state fixed effects. Panel A uses total, systematic and idiosyncratic risk measures as dependent variables. Panel B uses return (ROE) and two risk-adjusted return measures as dependent variables. Standard errors in parentheses are corrected for heteroskedasticity.

Panel A

Dep Variable:	Total risk			Systematic			Unsystematic		
Model:	I	II	III	I	II	III	I	II	III
Intercept	0.660 *** (0.08)	-0.060 (0.117)	-0.050 (0.12)	-2.000 *** (0.15)	-2.710 *** (0.54)	-2.630 *** (0.544)	0.704 *** (0.078)	0.148 (0.094)	0.153 * (0.09)
IB Dummy	0.058 *** (0.02)	----	----	0.057 * (0.034)	----	----	0.047 ** (0.019)	----	----
IB Assets/TA	----	0.000 (0.002)	----	----	-0.006 (0.006)	----	----	0.000 (0.001)	----
IB net inc/oper inc	----	----	0.003 (0.002)	----	----	0.017 * (0.01)	----	----	0.001 (0.002)
(Nonint inc-IB net inc)/oper inc	0.004 (0.004)	0.010 (0.007)	0.009 (0.007)	0.001 (0.003)	0.019 (0.025)	0.020 (0.02)	0.004 (0.003)	0.008 (0.005)	0.007 (0.005)
Loans/Assets	-0.014 (0.32)	0.111 * (0.066)	0.105 ** (0.045)	0.033 (0.098)	0.260 (0.28)	0.495 *** (0.169)	-0.015 (0.028)	0.070 (0.05)	0.082 ** (0.035)
log(TA)	-0.024 *** (0.003)	0.015 ** (0.007)	0.015 ** (0.006)	0.189 *** (0.009)	0.225 *** (0.027)	0.208 *** (0.027)	-0.029 *** (0.003)	0.001 (0.006)	0.000 (0.005)
Equity/assets	-1.200 *** (0.309)	-0.778 (0.566)	-0.740 (0.55)	-0.980 (0.64)	-0.560 (2.44)	-0.027 (2.41)	-1.106 *** (0.298)	-0.816 * (0.46)	-0.779 * (0.449)
Rsq	0.1	0.57	0.57	0.27	0.44	0.44	0.1	0.45	0.45
N	3177	198	198	3181	198	198	3177	198	198

Panel B

Dep Variable:	ROE			ROE/ $\sigma_E$			ROE/ $\beta$		
Model:	I	II	III	I	II	III	I	II	III
Intercept	0.500 *** (0.12)	-0.605 (0.487)	-0.560 (0.493)	-5.620 *** (1.305)	3.420 (3.85)	3.760 (3.74)	-12.330 (16.61)	-1.670 (2.11)	-1.630 (2.13)
IB Dummy	0.050 * (0.03)	-0.470 ----	-0.180 ----	-1.020 *** (0.291)	----	----	-8.570 (8.06)	----	----
IB Assets/TA	----	-0.008 (0.007)	----	----	0.030 (0.052)	----	----	0.004 (0.016)	----
IB net inc/oper inc	----	----	0.006 (0.0155)	----	----	0.135 (0.106)	----	----	0.018 (0.016)
(Nonint inc-IB net inc)/oper inc	-0.001 (0.002)	-0.009 (0.013)	-0.008 (0.0135)	-0.024 ** (0.012)	-0.202 ** (0.094)	-0.235 ** (0.099)	-0.099 (0.109)	-0.030 ** (0.015)	-0.035 ** (0.017)
Loans/Assets	-0.196 ** (0.08)	-0.470 * (0.255)	-0.180 (0.254)	-0.878 (0.858)	1.560 (2.21)	0.837 (1.72)	47.560 (50.98)	0.527 (0.798)	0.430 (0.42)
log(TA)	-0.033 *** (0.007)	0.026 (0.026)	0.009 (0.027)	0.267 *** (0.079)	-0.329 (0.201)	-0.324 * (0.183)	2.110 (2.1)	0.064 (0.107)	0.065 (0.112)
Equity/assets	-2.270 *** (0.49)	0.530 (2.54)	0.926 (2.48)	9.060 (5.96)	7.050 (21.008)	8.590 (20.93)	-628.800 (623.3)	-0.814 (4.26)	-0.600 (3.98)
Rsq	0.45	0.64	0.64	0.33	0.71	0.71	0.004	0.21	0.21
N	3181	198	198	3176	198	198	3176	198	198

\*, \*\*, \*\*\* statistically significant at the 10%, 5% and 1% levels, respectively

**Table 4 Bank Risk and Return Regressions (1990-1994)**

Panel A																		
Dep Variable:	Total risk						Systematic						Unsystematic					
Model:	I		II		III		I		II		III		I		II		III	
Intercept	1.06 ***	0.48 ***	0.46 ***	0.17	0.16	0.15	-1.94 ***	0.45	-0.81	1.06 ***	0.36 ***	0.34 ***	0.16	0.12	0.11			
IB Dummy	0.07	----	----	0.17	----	----	0.00	----	----	0.06 **	----	----	0.03	----	----			
IB Assets/TA	----	0.00	----	----	0.00	----	----	-0.01	----	----	0.00	----	----	0.00	----			
IB net inc/oper inc	----	----	0.01	----	0.01	----	----	----	0.03	----	----	0.00	----	----	0.00			
(Nonint inc-IB net inc)/oper inc	0.01 **	0.01 *	0.01	0.00	0.01	0.01 **	0.03	0.02	0.01 **	0.01 *	0.01 *	0.01 *	0.00	0.00	0.00			
Loans/Assets	0.05	0.32 **	0.33 ***	0.06	0.16	0.06	0.12	0.34	0.94 ***	0.03	0.22 **	0.25 ***	0.06	0.11	0.04			
log(TA)	-0.04 ***	-0.01	-0.01	0.01	0.01	0.01	0.19 ***	0.13 ***	0.11 ***	-0.04 ***	-0.01	-0.01 *	0.01	0.01	0.01			
Equity/assets	-3.87 ***	-5.02 ***	-4.81 ***	1.02	0.92	0.83	-4.07 ***	-12.10 ***	-9.52 **	-3.54 ***	3.52 ***	-3.36 ***	0.08	0.58	0.59			
Rsq	0.08	0.58	0.59	0.08	0.58	0.59	0.18	0.38	0.39	0.09	0.55	0.55	0.08	0.58	0.59			
N	1372	83	83	1372	83	83	1372	83	83	1372	83	83	1372	83	83			

  

Panel B																		
Dep Variable:	ROE						ROE/ $\sigma_E$						ROE/ $\beta$					
Model:	I		II		III		I		II		III		I		II		III	
Intercept	1.93 ***	1.65	1.41	0.26	1.58	1.35	6.32 **	12.86	12.76	0.02	1.23	1.42	0.26	1.58	1.48			
IB Dummy	0.02	----	----	0.06	----	----	-0.77	----	----	0.07	----	----	0.06	----	----			
IB Assets/TA	----	-0.01	----	----	0.03	----	----	0.08	----	----	0.02	----	----	0.02	----			
IB net inc/oper inc	----	----	0.04	----	----	0.05	----	----	0.41 *	----	----	0.03	----	----	0.04			
(Nonint inc-IB net inc)/oper inc	0.00	-0.01	-0.02	0.01	0.05	0.05	-0.06 **	-0.08	-0.21	0.04	-0.01	-0.02	0.01	0.04	0.03			
Loans/Assets	-0.34 **	0.24	0.52	0.15	0.24	0.52	-3.11 *	4.83	2.42	-1.01	1.00	0.31	0.15	1.29	0.93			
log(TA)	-0.06 ***	-0.06	-0.07	0.01	0.06	0.06	-0.09	-0.81	-0.75	0.12	-0.10	-0.08	0.01	0.06	0.07			
Equity/assets	-4.79 ***	-5.77	-3.82	1.18	8.86	7.39	3.51	12.13	19.12	-15.04	1.51	1.04	0.03	0.02	0.04			
Rsq	0.03	0.02	0.04	0.03	0.02	0.04	0.01	0.07	0.13	0.001	0.05	0.07	0.03	0.02	0.04			
N	1372	83	83	1372	83	83	1371	83	83	1371	83	83	1372	83	83			

\*, \*\*, \*\*\* statistically significant at the 10%, 5% and 1% levels, respectively

**Table 5 Bank Risk and Return Regressions (1995-1999)**

Panel A												
Dep Variable:	Total risk						Systematic			Unsystematic		
Model:	I	II	III		I	II	III		I	II	III	
Intercept	0.37 ***	-0.24	-0.22		-2.11 ***	-3.41 ***	-3.31 ***		0.44 ***	0.09	0.10	
	0.04	0.21	0.20		0.16	0.68	0.70		0.03	0.15	0.13	
IB Dummy	0.04 ***	----	----		0.12 ***	----	----		0.02 ***	----	----	
	0.01				0.04				0.01			
IB Assets/TA	----	0.00	----		----	-0.01	----		----	0.00	----	
		0.00				0.01				0.00		
IB net inc/oper inc	----	----	0.01 ***		----	----	0.01		----	----	0.00	
			0.00				0.01				0.00	
(Nonint inc-IB net inc)/oper inc	0.00	0.02	0.03 **		0.00	0.03	0.04		0.00	0.01	0.02 **	
	0.01	0.02	0.02		0.00	0.05	0.05		0.01	0.01	0.01	
Loans/Assets	-0.03	-0.01	0.03		-0.09	0.15	0.36		-0.03	-0.04	-0.02	
	0.03	0.13	0.09		0.10	0.33	0.26		0.02	0.08	0.06	
log(TA)	-0.01 ***	0.02	0.01		0.18 ***	0.24 ***	0.23 ***		-0.02 ***	0.00	-0.01	
	0.00	0.01	0.01		0.01	0.03	0.04		0.00	0.01	0.08	
Equity/assets	-0.30 *	1.19	1.15		0.56	1.86	1.99		-0.28 *	0.83	0.82	
	0.18	0.85	0.79		0.58	2.82	2.83		0.17	0.57	0.53	
Rsq	0.1	0.08	0.12		0.36	0.45	0.45		0.15	0.05	0.07	
N	1805	115	115		1809	115	115		1805	115	115	

  

Panel B												
Dep Variable:	ROE				ROE/ $\sigma_E$				ROE/ $\beta$			
Model:	I	II	III		I	II	III		I	II	III	
Intercept	0.81 ***	-0.23	-0.14		-3.59 *	12.00	10.13		-35.40	-1.70	-1.76	
	0.19	0.88	0.91		2.14	10.36	10.35		41.98	3.19	3.21	
IB Dummy	0.13 **	----	----		-0.63	----	----		-15.21	----	----	
	0.05				0.69				13.90			
IB Assets/TA	----	-0.01	----		----	0.02	----		----	0.00	----	
		0.01				0.12				0.02		
IB net inc/oper inc	----	----	-0.01		----	----	-0.40 **		----	----	-0.03	
			0.02				0.17				0.02	
(Nonint inc-IB net inc)/oper inc	-0.01 ***	-0.01	-0.04		-0.04 ***	-1.15	-1.18		-0.05	-0.15	-0.21	
	0.00	0.07	0.08		0.01	0.85	0.81		0.16	0.18	0.14	
Loans/Assets	-0.40 ***	-0.91	-0.07		-1.98 *	0.21	-3.71		82.60	0.25	0.12	
	0.13	0.59	0.40		1.18	6.25	4.96		87.60	0.91	0.58	
log(TA)	-0.01	0.06	0.04		0.57 ***	-0.18	0.13		3.94	0.14	0.15	
	0.01	0.04	0.04		0.13	0.51	0.46		3.95	0.17	0.17	
Equity/assets	-0.80	4.16	4.48		13.02 *	-31.70	-31.70		-886.80	-5.60	-5.44	
	0.70	4.24	4.19		7.38	52.90	52.50		888.00	7.70	7.36	
Rsq	0.02	0.58	0.03		0.02	0.02	0.06		0.002	0.03	0.03	
N	1809	83	115		1805	115	115		1805	115	115	

\*, \*\*, \*\*\* statistically significant at the 10%, 5% and 1% levels, respectively

**Table 6 Bank Risk and Return: Post-GLBA (2000-2005)**

Panel A															
Dep Variable:	Total risk						Systematic						Unsystematic		
Model:	I	II	III				I	II	III				I	II	III
Intercept	0.320 ***	0.204 ***	0.330 ***				-2.420 ***	-2.230 ***	-2.210 ***				0.370 ***	0.260 ***	0.380 ***
	0.050	0.041	0.040				0.320	0.420	0.349				0.040	0.035	0.030
IB Dummy	0.014	----	----				-0.440 ***	----	----				0.015	----	----
	0.014						0.055						0.013		
IB Assets/TA	----	-0.004 **	----				----	-0.040 ***	----				----	-0.003 **	----
		0.002						0.008						0.001	
IB fee inc/oper inc	----	----	0.000				----	----	-0.001				----	----	0.000
			0.000						0.001						0.002
(Nonint inc-IB fee inc)/oper inc	0.007 **	0.002	0.002				0.001	-0.001	0.001				0.006 **	0.002	0.002
	0.003	0.002	0.002				0.002	0.002	0.003				0.003	0.002	0.002
Loans/Assets	-0.076 *	-0.080 **	-0.076 *				-0.380 ***	-0.440 ***	-0.366 ***				-0.040	-0.053	-0.040
	0.043	0.040	0.045				0.113	0.140	0.129				0.030	0.034	0.030
log(TA)	-0.005 **	0.001	-0.001				0.198 ***	0.180 ***	0.178 ***				-0.012 ***	-0.006 ***	-0.014 ***
	0.002	0.002	0.002				0.015	0.020	0.014				0.002	0.002	0.001
Equity/assets	-0.570 ***	-0.388 **	-0.387 **				3.440 ***	5.030 **	4.190 **				-0.601 ***	-0.470 ***	-0.440 ***
	0.150	0.163	0.160				1.330	2.030	1.690				0.137	0.130	0.130
Rs <sub>q</sub>	0.06	0.02	0.02				0.05	0.04	0.04				0.08	0.03	0.05
N	2381	1817.00	1995				2383	1818	1997				2381	1817	1995

  

Panel B															
Dep Variable:	ROE						ROE/σ <sub>E</sub>						ROE/β		
Model:	I	II	III				I	II	III				I	II	III
Intercept	1.250 ***	1.330 ***	1.570 ***				6.290 ***	9.400 ***	7.820 ***				7.150	4.240	4.770
	0.138	0.130	0.127				2.100	1.590	1.940				10.850	12.320	10.830
IB Dummy	0.042	----	----				0.230	----	----				0.940	----	----
	0.043						0.670						2.010		
IB Assets/TA	----	0.012 **	----				----	0.270 ***	----				----	0.247	----
		0.006						0.093						0.250	
IB fee inc/oper inc	----	----	-0.001				----	----	-0.006				----	----	0.020
			0.001						0.007						0.160
(Nonint inc-IB fee inc)/oper inc	-0.002	-0.003	0.001				-0.050 *	-0.060	-0.050				-0.037	-0.023	-0.090
	0.003	0.005	0.003				0.030	0.047	0.090				0.036	0.035	0.134
Loans/Assets	0.112	0.180 *	0.173 *				1.530	3.240 **	1.900				0.670	8.300	3.640
	0.100	0.100	0.098				1.360	1.510	1.530				6.020	6.290	6.490
log(TA)	-0.050 ***	-0.050 ***	-0.065 ***				-0.202	-0.419 ***	-0.257 **				-0.479	-0.512	-0.520
	0.007	0.007	0.006				0.144	0.100	0.122				0.650	0.680	0.590
Equity/assets	-2.890 ***	-3.270 ***	-3.780 ***				-8.900	-16.700 **	-13.800 *				8.470	-9.040	19.900
	0.510	0.690	0.610				6.020	7.260	7.630				30.780	41.400	41.600
Rs <sub>q</sub>	0.04	0.05	0.07				0.00	0.02	0.01				0.00	0.00	0.00
N	2383	1818	1997				2381	1817	1995				2381	1817	1995

\*, \*\*, \*\*\* statistically significant at the 10%, 5% and 1% levels, respectively