Bank Diversification and Future Stock Price Performance: Evidence from Post-Acquisition Returns after the GLBA

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Abstract

Shareholder optimism around the announcement of the GLBA seems to be at odds with recent findings that imply that the GLBA cannot be justified on the grounds of risk reduction or increased returns. Using banks' acquisition of other banks, investment banks, and insurance companies as a measure of diversification, we find that banks that acquire investment banks and insurance companies earn 97 and 83 basis points higher annualized average *risk-adjusted return* than those that acquire other banks. Thus, the GLBA seems justifiable on grounds of risk-adjusted returns. Both acquirers' announcement-day abnormal returns and the acquisition premium increase with diversification, suggesting that investors and the market for corporate control correctly perceive, at the time of the announcement or acquisition, the benefit of diversification.

Keywords: Bank diversification, Post-acquisition performance, Mergers & acquisitions, Acquisition premium, Gramm-Leach-Bliley Act, Financial Services Modernization Act

1. Introduction

While our understanding of the effect of the operational diversification of U.S. industrial firms on their performance is grounded in a substantial amount of empirical evidence (see, e.g., Lang and Stulz (1994), Berger and Ofek (1995), Servaes (1996), Lamont and Polk (2001), Campa and Kedia (2002), Villalonga (2004a, b)), the impact of diversification on U.S. banks is less well known. In particular, while the "multi-segment" firm is at the core of the industrial diversification literature, relatively little is known about how diversification by U.S. banks into nonbanking segments affect their performance, and hence shareholders' wealth. This is because of the previous restrictions on this kind of diversification, which were lifted only with the passing of the Gramm-Leach-Bliley Act (GLBA) of 1999.

Hence, although academic interest in this issue goes back nearly three decades (see, e.g., Eisenbeis, Harris, and Lakonishok (1984)), it is only recent work that has been able to overcome data limitations in order to provide unequivocal empirical evidence on the effect of nonbank diversification on U.S. banks. However, a puzzle seems to be emerging with these recent studies. Early works examining the announcement or passage of the GLBA (Lown et al. (2000), Akhigbe and Whyte (2001), Yu (2003), and others) suggest that the financial market envisaged that taking advantage of the opportunity to diversify would be beneficial to banks and other financial firms, ultimately benefiting shareholders through risk reduction and/or increased returns. In contrast, examining evidence of diversification that actually capitalizes on this new-found opportunity, Geyfman and Yeager (2009) find that they "cannot justify the GLBA on risk-reduction grounds..." Interestingly, Schmid and Walter (2009) find that bank-investment bank as well as bank-insurance company mergers trade at a premium relative to their focused counterparts. (Note 1) One of several possible explanations for this is that their post-merger future returns are low relative to the returns on the matching portfolio of financial firms that remain focused (see, e.g., Lamont and Polk (2001)). Therefore, these studies might lead us to question whether the GLBA can be justified on risk-return grounds and whether the financial market might have had misplaced optimism about the GLBA. Likewise, since the market for corporate control has been active in the post-GLBA period (Schmid and Walter (2009)), it might also be engaged in misplaced optimism, providing the motivation for acquisitions is not managerial self-interest. In recent studies, Elyasiani, et al. (2015), and Vallascas and Hagendorff (2011) find significant effects on risk and/or returns from bank mergers and acquisitions on non-banking firms.

In light of the above, using commercial banks' acquisitions of 1) commercial banks, 2) investment banks, and 3) insurance companies as proxies for increasingly diversified operations (Note 2), we ask: Do banks' post-acquisition stock returns increase in the diversity of their acquisition deals? We then examine whether or not the financial market displays optimism about the effects of diversification on banks' future returns at the time of the announcement of banks' attempts to actualize the benefits offered by the GLBA. Managers' intention in acquisitions is not fully revealed to investors but, as Benston et al. (1995) argue, even where managers are motivated to engage in acquisitions in order to enhance the put option offered by deposit insurance their actions can improve shareholders' wealth if wealth increases in the value of banks' deposit insurance. Therefore, investors might perceive diversifying acquisitions as a value-enhancing activity. We extend the line of research that find a positive market reaction to the announcement of the GLBA by asking: Are there abnormal returns at the time of the announcement of post-GLBA acquisitions and do they increase in the diversity of the acquisition deal?

If the market for corporate control shares in the optimism about the opportunity provided by the GLBA to diversify banks' operations, then that should be reflected in acquisition premiums. Therefore, we assess the perception in the market for corporate control of the opportunities created by the GLBA by examining if the acquisition premium increases with the diversity of the acquisition deal. Benston et al. (1995) examine if shareholder wealth maximization through earnings diversification (shareholder-wealth-enhancement hypothesis) or a deposit insurance put-option-enhancement hypothesis explains the premiums paid in bank acquisition deals. If earnings diversification is the predominant motive for acquisition, then premiums are expected to increase monotonically with the diversity of the acquisition. In contrast, the opportunity to acquire other firms may be used to increase the value to bank managers of the put option provided by deposit insurance. That is, managers might diversify to increase the probability of becoming "too big to fail," in essence extracting 100% insurance coverage of their deposits (O'Hara and Shaw (1990)). In pursuit of this goal, managers will pay larger premiums for entities whose earnings are more highly correlated with the bank's earnings (Benston et al. (1995)). That is, they will choose to pay higher premiums for other banks. This implies that acquisition premiums will be declining with diversity. Therefore, we ask: Do acquisition premiums increase in the diversity of the acquisition deal?

The issue of whether post-acquisition stock performance increases with the diversity of the acquisition deal cannot be resolved simply by appealing to economic theory because, as discussed in Laeven and Levine (2007), Geyfman and Yeager (2009), Schmid and Walter (2009), and others, theory has conflicting predictions about the effect of diversification on bank performance. More important to this paper, we are unable to infer an answer to this question from current empirical evidence on the effect of diversification on U.S. banks. Furthermore, inferences based on countries with universal banking are problematic given significant differences in legal structure, sector competitiveness, and business culture, as well as mixed empirical evidence on the effect of diversification on performance (see Berger et al. (2000) for a survey). Likewise, inferences from industrial firms are confounded by the regulation and "specialness" of banks.

We use U.S. bank acquisitions after the passage of the GLBA to examine whether the annualized average stock return in the first three years post-acquisition for banks that acquire investment banks and insurance companies, respectively, is higher than that for banks that acquire other banks. We find that banks' average annualized, risk-adjusted post-acquisition stock returns increase in the diversity of the acquisition deal, although not monotonically. Specifically, annualized average return is about 97 and 83 basis points higher for banks that acquire investment banks and insurance companies, respectively, than for banks that acquire other banks. The nonmonotonicity of the increase lends some support to the conjecture that bank managers are not able to exploit fully the opportunities arising from diversifying into the insurance sector, which is outside of the area of core competence of senior managers (Winton 1999)).

These results are robust to, adjusting the standard errors for clustering at the acquirer firm level, the definition of the diversity proxy, controlling for bank efficiency, omission of serial acquirer banks from the sample, controlling for various bank-specific, business condition, and systematic risk variables, and accounting for possible endogeneity between performance and diversification.

The evidence also indicates that investors are optimistic about the value of bank diversification at the time of the announcement of the acquisition. Conditional on the form of payment and target and acquirer characteristics, acquirers' announcement-day abnormal returns for the acquisition of investment banks and insurance firms, respectively, are 11 and 8 basis points higher than that for the acquisition of other banks. Based on the previous results, it appears that this optimism is not misplaced.

Finally, acquisition premiums increase in the diversity of the deal. Relative to the acquisition of other banks, managers pay about 65 basis points higher premium for acquiring investment banks, but no excess premium for acquiring insurance companies. Thus, while managers seem to like the opportunity to diversify, it appears that they are unwilling to pay higher premiums for exposure to the insurance business, considered somewhat outside their area of expertise, than they pay for acquisitions in or close to their core business. These results are broadly consistent with the wealth-enhancement hypothesis.

Our paper contributes to the nascent literature on U.S. bank diversification in which the organizational form of the diversified bank is akin to that of the multi-segment industrial firm. In contrast to the conclusion by Geyfman and Yeager (2009) that they cannot justify the GLBA on the grounds of risk-reduction, focusing on post-diversification returns our findings support the GLBA on the grounds that the diversification opportunities it provides contributes to increased risk-adjusted returns. Furthermore, as far as we are aware, ours is the first paper to examine how the market for corporate control perceives the opportunities for post-GLBA diversification. Together, our results imply that the optimism expressed in market responses to the announcement of the ratification of the GLBA had not subsequently evaporated into "buyers' remorse." (Note 3)

The remainder of the paper is organized as follows. Section 2 (and Appendix A) describes the data and provides sample description and preliminary statistics of relevant variables. Section 3 contains the main empirical results. The paper concludes with a summary of the findings in Section 4.

2. Data and Descriptive Statistics

In this section we first describe the main data used in the execution of the tests below and then provide summary statistics of the various variables. Detailed variable definitions are in Appendix A.

2.1 Data

To examine the above issues, we identify all U.S.-based commercial bank acquisitions of other commercial banks, investment banks, and insurance companies, from November 12, 1999 to December 31, 2002. The end-of-sample date reflects the fact that we require three-year post-acquisition returns; thus the effective end of sample is December 2005. These data are provided by the Worldwide M&A section of the SDC Platinum database. We obtain information on i) the identity of the firms involved in the M&A, ii) the primary four-digit SIC code of the acquirer and target, iii) the status of the transaction, iv) the transaction value, and v) the market capitalization of the target and acquirer.

We use the CUSIP as well as the SIC classification from Compustat to identify commercial banks (SIC 6021 and 6022), investment banks (3 digit SIC code 620), and insurance companies (3 digit SIC codes 631, 632, and 633) in order to supplement the SDC Platinum data with information from the accounting statements. We also obtain stock price information from the Center for Research in Security Prices (CRSP) database. Our final sample consists of 353 acquisitions by banks–273 banks, 58 investment banks, and 22 insurance companies–in the post-GLBA period after allowing for the availability of accounting and trading data. There are a total of 194 distinct acquirers in the sample. Summary statistics of these data are in Table 1 below.

In addition to the above data, we also require a measure of bank efficiency. There are several ways to measure bank efficiency. These include estimated efficiencies (Berger and Mester (2003)) or linear programming efficiency measures (Wheelock and Wilson (1999) and Alam (2001)). Berger (1993) and Berger et al. (2000) utilize the most widely cited banking profit efficiency measure – a distribution-free method. First, using a sample of 2,214 banks that had all the required data between 1999 and 2005, we estimate the profit function. Using this estimate, we then calculate the profit efficiency for each bank using the distribution-free method. The distribution-free method distinguishes efficiency differences from random error by averaging the profit function residuals over time. (Note 4) Specifically, the estimate of efficiency for a particular bank in the sample is determined as the difference between the average residual of the control sample and the residual of the particular bank. We use the profit efficiency measure to test the efficiency hypothesis because it is a comprehensive measure that includes both cost and income variables. The variables included in the profit efficiency estimation model are net income, net sales, cost of sales, earnings before interest and taxes, and non-operating expenses. These data are from Compustat.

As an alternative measure, we use operational efficiency, defined as the ratio of the bank's operational expenses to the bank's assets (Harris and Robinson (2003)). This allows us to determine if improvements in cost control (operational efficiency) or both cost and sales (distribution-free profit efficiency) drive post-acquisition returns and to be consistent with previous work (Berger and Hannan (1998), Berger et al. (2000), Berger and DeYoung (2001)).

Finally, we need data on various target and acquirer firm characteristics, such as total assets, financial leverage, operating expense, net sales, cash, cash flow, cost of sales, non-operating expenses, return on assets, and return on investment. These are obtained at the fiscal year-end prior to the acquisition. These data are from Compustat and the specific definitions are in Appendix A.

Table 1. Description of Financial Industry Acquisition Transactions

This table presents summary statistics for the sample of U.S. bank acquisitions of banks, investment banks, and insurance companies from November 12, 1999 to December 31, 2002. Except for the number of acquirers and acquisitions and the return on assets and return on investments (which are in percentage), values are reported in millions. See the data appendix for description of the variables. ***, ** and * denote significance at the 1%, 5%, and 10% levels, respectively.

	All (1)	Bank (2)	Invest Bank (3)	Insurance (4)	Difference (3)-(2)		Difference (4)-(2)		Difference (4)-(3)	
Panel A: Acquisition Characteristics										
Number of Acquisitions	353	273	58	22						
Number of Acquirers	194	145	36	13						
Transaction Value	477.10	363.50	985.66	401.06	622.16		37.55		-584.60	
Panel B: Acquirer Characteristics										
Assets	63896.24	17530.08	52090.41	200774.77	34560.34	***	183244.69	**	148684.36	*
Financial Leverage	30425.81	13169.26	38788.61	47018.21	25619.35		33848.95	*	8229.60	
Operating Expense	313.16	245.66	579.05	2577.81	333.39	***	2332.15	***	1998.75	
Net Sales	1333.11	1080.23	5358.68	30.07	4278.45	***	-1050.15		-5328.61	*
Cash	1120.91	1107.45	9501.72	15.27	8394.26	***	-1092.19		-9486.45	*
Cash Flow	154.35	29.01	175.83	14.35	146.82	***	-14.65	*	-161.48	*
Cost of Sales	993.41	593.07	1749.73	2785.04	1156.66	***	2191.97	*	1035.31	
Non-Operating Expense	212.53	139.59	364.50	26.84	224.92	*	-112.75	*	-337.66	
Return on Assets	1.01	1.04	1.03	1.33	0.00		0.30	*	0.30	
Return on Investment	9.42	9.96	9.67	14.88	-0.29		4.92	**	5.21	
Panel C: Target Characteristics										
Assets	3129.77	2399.09	10993.88	60070.00	8594.79	***	57670.92		49076.13	
Financial Leverage	980.48	1543.95	7746.09	11094.85	6202.13	**	9550.90	*	3348.76	
Operating Expense	57.55	101.46	181.47	910.46	80.00		808.99	**	728.99	
Net Sales	43.05	122.90	1006.54	8.25	883.65	***	-114.65	*	-998.30	**
Cash	79.36	187.98	2108.96	6.80	1920.98	***	-181.18		-2102.16	**
Cash Flow	10.54	6.03	41.40	6.20	35.38	***	0.18		-35.20	*
Cost of Sales	51.46	87.99	397.99	859.38	310.00	**	771.39	*	461.39	
Non-Operating Expense	12.41	22.51	74.39	8.59	51.88	*	-13.92	*	-65.80	*
Return on Assets	0.05	0.12	0.20	0.35	0.08	**	0.23	**	0.16	
Return on Investment	2.85	3.10	1.85	5.02	-1.25	*	1.93	**	3.18	

2.2 Descriptive Statistics

In this section we discuss summary statistics of the data used in the tests and provide preliminary links between diversity in the M&A deal and post-acquisition stock returns and the acquisition premium.

2.2.1 Acquirer and Target Descriptive Statistics

Table 1 provides summary statistics of the main variables for the sample of bank M&As. From Panel A, across all transactions the average transaction value is about $477 million. There is some dispersion in the average transaction values across the different types of acquisitions, with that for investment banks being economically larger than that for other banks and insurance firms. However, these differences are not statistically significant. The evidence in Panel B indicates that acquirers are generally larger, with average net asset of $64 billion, than the average target, with $3.13 billion in assets (Panel C). However, it should be noted that acquisitions are not undertaken solely by large banks (Rhoades (2000)). Not unexpectedly, acquirers have substantially better operating performance than targets, with a mean return on assets (ROA) of 1.01% and return on investment (ROI) of 9.42%, compared to 0.05% and 2.85% for targets. This is consistent with the notion that acquisitions are motivated by possible efficiency gains, whereby highly efficient firms acquire other relatively inefficient firms and raise their efficiency to the benefit of the combined entity. These preliminary statistics are similar to those reported by Berger and Mester (2003) and others.

A closer inspection of the table indicates that both acquirer bank size (Panel B) and target bank size (Panel C) increases monotonically in the diversity of the deal. For instance, in bank acquisitions the average asset size of the acquirer is $17.5 billion compared to $2.4 billion for the target, whereas banks that acquire investment banks have assets of $52 billion compared to their targets' $11 billion. Similarly, banks that acquire insurance companies have mean assets of $201 billion while their targets' average size is $60 billion. Overall, these statistics indicate that there are significant differences in both the acquirers and targets involved in increasingly diversified mergers, which we account for in the models below.

2.2.2 Pre-acquisition Efficiency

Panel A of Table 2 summarizes the data on the main and alternative measures of efficiency for targets and acquirers in the pre-acquisition period. The mean of the distribution-free profit efficiency for acquirers is 0.78. This means that the average bank in our sample earns about 78% of the profits of the most efficient or best-practice bank in the benchmark sample conditional on output and business conditions for all banks being the same. This is highly similar to the 0.70 found by Berger and Hannan (1998) and the 0.77 by Berger et al. (2000), suggesting the absence of any major error in our replication of the measure. The mean operational efficiency for acquirers is 0.23, which means that operational expenses equivalent to 23% of total assets are used to manage and operate the average acquirer. Not surprisingly, the correlation between the measures of efficiency is not very high, 0.61, as they account for different aspects of efficiency. The evidence further indicates that in the pre-acquisition period acquirers are significantly more efficient than targets, using either measure of efficiency. This is consistent with established results (see, e.g., Berger et al. (2000)) and is often cited as a motivation for acquisitions.

Table 2. Summary Statistics of Bank Efficiency, Post-Acquisition Returns, and Acquisition Premiums

Panel A reports descriptive statistics of bank efficiency measures in the pre- and post-acquisition periods. The profit efficiency measure uses the distribution-free method. Operational efficiency is the ratio of operating expenses to the total assets of the financial institution. Panel B reports the three-year post-acquisition returns (in percent) for the entire sample of acquirer banks, for banks that acquired other banks, for banks that acquired investment banks, and for banks that acquired insurance companies. Panel C reports acquisition premiums for the subsamples described above. Acquisitions are from November 12, 1999 to December 31, 2002, for a total of 353 completed acquisitions where U.S. banks acquire U.S. financial firm targets in the post-GLBA period. ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

Panel A: Efficiency measures

Variable		Sample Size	Mean	Median	Std dev	Correlation
Pre-acquisition						
Acquirer	Profit Efficiency	353	0.782	0.769	0.320	
	Operational Efficiency	328	0.228	0.220	0.113	0.61
Target	Profit Efficiency	331	0.602	0.587	0.221	
	Operational Efficiency	338	0.140	0.125	0.073	0.73
Difference	Profit Efficiency	325	0.180**			
	Operational Efficiency	328	0.088**			
Post-acquisition						
Merged	Profit Efficiency	353	0.774	0.762	0.307	
	Operational Efficiency	328	0.216	0.211	0.107	0.69

Panel B: Three-year post-acquisition return (%)

Entire Sample (1)	Bank-Bank Mergers (2)	Bank-IBank Mergers (3)	Bank-Insurance Mergers (4)
8.36	4.69	11.02	9.37
Difference	(2)-(3)	(2)-(4)	(3)-(4)
	-6.33***	-4.68**	1.65

Panel C: Acquisition premiums (%)

	Entire Sample (1)		Bank-Bank Mergers (2)		Bank-IBank Mergers (3)		Bank-Insurance Mergers (4)	
	N	mean	N	mean	N	mean	N	mean
1999	21	20.0	10	19.5	9	20.7	2	19.7
2000	109	16.7	84	16.6	20	17.6	5	15.8
2001	81	15.8	71	15.2	7	19.9	3	20.6
2002	64	18.8	54	18.9	9	19.4	1	10.3
All Years	275	17.2	219	16.8	45	18.9	11	17.3
		Difference		(2)-(3)		(2)-(4)		(3)-(4)
				-2.1***		-0.5		1.6

2.2.3 Post-acquisition Stock Return and Transaction Premiums

Panel B of Table 2 reports preliminary evidence on the link between post-acquisition returns and diversity. The evidence indicates that post-acquisition stock returns are increasing with diversity, as returns are significantly higher for banks that acquired investment banks (11%) and insurance companies (9.4%) than for banks that acquired other banks (4.7%). Although post-acquisition returns do not increase monotonically with diversification, these statistics suggest that management might have been able to transform the gains from the diversification opportunities provided by the GLBA to value for investors.

We also estimate correlations (not reported) between the post-acquisition returns and several variables of interest. As expected, the post-acquisition returns are significantly and positively correlated with the measures of banking efficiency. More important, the correlations between the post-acquisition returns and the measures of bank diversity are positive, large, and statistically significant, with the correlation between returns and bank-investment bank acquisitions being larger than the correlation between returns and bank-insurance firm acquisitions.

Panel C provides summary statistics on the transaction premium, defined as in Palia (1993):

[(price paid for target (i.e., transaction value) - book value of target's equity)/transaction value].

The average premium across all firm-years is 17.20%, with a range of 15.8% to 20.7% on a yearly basis. On average, banks pay an economically larger premium to acquire investment banks (18.9%) and insurance companies (17.3%) than to acquire other banks (16.8%). Tests of differences in mean confirm that the average premium for the acquisition of investment banks, but not for the acquisition of insurance companies, is statistically significantly different from the average premium for the acquisition of banks. These statistics are the first evidence in support of the idea that after the GLBA, managers of acquiring banks value, and pay large premiums for, the opportunity to diversify their earnings stream. However, that the average premium paid for the acquisition of insurance companies is not statistically different from that paid for other banks suggests that while bidder managers are prepared to pay more for diversity, they are wary of paying too much for insurance services that might be outside of their zone of competence.

For the full sample and all sub-samples except for insurance firms as targets, acquirers paid the highest premium in 1999, the last year of the decade-long bull market. This is not surprising, given the impact of hubris on acquisition premiums (Hayward and Hambrick (1997), Rau and Vermaelen (1998)), as during this period it is more likely that hubris influenced these deals. Subsequently, there is a sharp decline in the premiums paid. Note that the fall in the stock market and, hence, decline in the market value of equity of the target cannot completely explain the drop in premium because acquirers could continue to pay similar premiums over the reduced value of the equity of the target.

3. Main Empirical Results

In this section we report the main empirical results. In subsection 3.1 we examine if post-acquisition stock returns are increasing in the diversity of the acquisition deal and provide robustness tests in subsection 3.2. In subsection 3.3 we examine the impact of diversity on the acquisition-announcement-day abnormal returns. In the final subsection, we discuss whether or not bank managers pay higher premiums for diversity through acquisitions.

3.1 Does Diversity Affect Post-acquisition Stock Performance? (Note 5)

Previously, the preliminary evidence indicates that post-acquisition stock returns are positively correlated with the diversity of the acquisition deal. We more rigorously examine this association here. An important issue to be resolved is the source(s) of any gains associated with post-GLBA acquisitions. While an increase in efficiency is a primary motivation for bank acquisitions (see, e.g., Berger et al. (2000)), it seems reasonable to expect that efficiency gains are more likely to be achieved when the acquirer and target are in the same line of business. That is, a post-merger combined bank is likely to benefit more from efficiency gains in the target bank if it can apply its efficient system to the target's operations. In contrast, because of differences in operations and business cultures between banks and, say, insurance firms, managerial and operational synergies might not materialize in a bank-insurance merger. (Note 6) Therefore, whether banks can obtain significant gains in efficiency by engaging in diversifying acquisitions remains an unresolved issue.

3.1.1 Impact of Diversity on Performance after Accounting for Acquirer and Target Characteristics

To examine the above issues, we first estimate a base model in which the post-acquisition return of the combined entities is regressed on the proxies for the diversity of the acquisition deals as well as control variables representing the characteristics of both the target and the acquirer:

$$\overline{R}_{it,t+3} = \delta_0 + \delta_1 bank/IB_i + \delta_2 bank/insurance_i + C'controls_i + e_i. \quad (1)$$

$\overline{R}_{it,t+3}$ is the annualized average post-acquisition return for acquirer bank *i* over three years, *bank/IB* is a dummy variable defined as one if an acquirer bank acquires an investment bank and zero otherwise, *bank/insurance* is a dummy variable defined as one if a bank acquires an insurance company and zero otherwise. The omitted category is a *bank-bank* dummy variable, defined as one when the acquirer bank acquires another bank. Together, these dummy variables represent the diversity of the transaction. The control variables include the usual accounting variables of

both the acquirer and the target at the time of the acquisition that have been previously examined in similar studies (see, e.g., Jensen and Ruback (1983))–*total assets, financial leverage, return on assets (ROA), return on investment (ROI), cash, cash flow, net sales, cost of sales,* and *non-operating income expense*. These variables are defined in the data appendix. We also include a dummy variable *equity payment* equal to one if the acquirer paid, in part or in full, with its own equity and zero otherwise. This reflects the fact that the M&A literature indicates that the form of payment in the acquisition deal matters as to how the market perceives the value of the acquisition (see, e.g., Faccio, McConnell, and Stolin (2004)). Finally, we include year dummy variables (*year*). To account for correlation between these variables, we report several specifications with different variables excluded to ensure that the main results are not affected by these correlations. The standard errors are adjusted for heteroskedasticity and, except for a model using banks that had only a single acquisition, clustering at the acquirer firm level.

The results are reported in Table 3. There is remarkably consistent evidence across the various specifications that post-acquisition returns increase in the diversity of the acquisition deal. Specifically, for banks that acquired investment banks, the annualized average return is about 111 basis points higher than that for banks that acquired other banks. This result is statistically significant at the 5% level. Similarly, banks that acquired insurance companies had about 101 basis points higher return than banks that acquired other banks, with statistical significance generally at the 10% level. As in the preliminary analysis, post-acquisition returns do not increase monotonically with diversity. This implies that although the acquisition of insurance companies is associated with greater future stock market performance than the acquisition of other banks, beyond a certain level of diversification banks may be moving too far away from their core competence and are unable to convert fully the opportunities for diversification into value for investors. This is inconsistent with Brewer et al. (1988), Boyd et al. (1993), and Wall et al. (1993) who are of the view that banks should do better in insurance services than in other noncore areas of business.

Table 3. Post-Acquisition Returns and Diversity in Bank Acquisition

This table reports results from regressing the cross-section of annualized average post-acquisition returns (in %) of acquirer banks on measures of diversity in bank acquisitions. Annualized returns are computed using three years of returns. Other variables are described in the data appendix. The sample consists of bank acquisitions over the period November 1999 to December 2002. ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

Variable	model i	model ii	model iii	model iv	model v	model vi	model vii	model viii	model ix	model x	model xi
Intercept	0.3982***	0.2387***	0.2837***	0.3001***	0.2648***	2.9010***	2.5793***	2.1302***	2.5414***	1.3328***	1.8428***
Bank/ IBank	1.1033**	1.2094**	1.0984**	1.1046**	1.1112**	1.0854**	1.0564**	1.0736**	1.0532**	1.2000**	1.1066**
Bank/ Insurance	0.9510*	0.9932*	1.0043*	1.0498**	1.0076*	1.0222*	1.0438**	1.0483*	0.9994*	0.9863*	0.9735*
Target Assets	0.1537*	0.1684*	0.1304*	0.1388*	0.1582*	0.1480*					
Target Fin. Leverage	-0.7485*	-0.7440*		-0.6694		-0.7021*		-0.7388*		-0.7563*	
Target ROA	0.0017	0.0014				0.0012	0.0019		0.0015		
Target ROI	0.0045		0.0049		0.0043		0.0050			0.0041	
Target Cash Flow	0.2836*		0.2493*	0.2230*	0.2058*			0.2174*		0.2738*	
Target Net Sales	0.3289*	0.3337*				0.3174*	0.3215*		0.3226*	0.3442*	0.3179*
Acquirer Assets	0.5782**	0.6349**					0.6648*	0.6531*	0.6740*	0.6904*	0.6837*
Acquirer Fin. Lev	-1.1325*			-1.0043*	-1.1152*		-1.1229*		-1.1673*	-1.2002*	-1.0998*
Acquirer Net Sales		0.0694**	0.0725**		0.0711**				0.0687**		
Acquirer Cash							0.1643*	0.1273*	0.1539*		
Acquirer Cash Flow				0.1104*		0.0947*				0.1118*	0.1009*
Acquirer ROA			8.367						5.028	7.3810	
Acquirer Cost of Sales	-0.1908	-0.1776	-0.2166					-0.2225			-0.2174
Non-Oper. Expense				-0.0444	-0.0523	-0.0611					
Equity Payment		0.5930	0.6003	0.5783		0.5574					
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Merger coefficients difference (*t*-stat)	(2.04)**	(2.02)**	(2.23)**	(1.67)*	(1.96)**	(1.92)*	(2.15)**	(1.99)**	(1.65)*	(2.37)**	(1.89)*
Number of Obs.	275	254	228	254	264	254	230	230	264	264	230
P-value (*F*-test)	0.0072	0.0086	0.0090	0.0086	0.0089	0.0098	0.0078	0.0083	0.0859	0.0092	0.0090
Adjusted R^2	0.8036	0.8123	0.8065	0.7934	0.8076	0.7999	0.8132	0.8371	0.8465	0.8433	0.7978

These results hold after controlling for various target and acquirer characteristics that also significantly affect the stock market performance of the combined entity in the post-acquisition period. For instance, the evidence shows that target characteristics such as assets, cash flows, and net sales are positively associated with the post-acquisition stock returns, suggesting that banks that acquire larger, more profitable targets tend to have better post-acquisition stock returns. On the other hand, post-acquisition returns decrease in the target's leverage. This is perhaps because highly leveraged targets have limited debt capacity and, thus, might constrain the acquirer's ability to pursue

debt-financed growth strategies. Similarly, post-acquisition stock returns increase with acquirer asset size, sales, and cash flows but decline with acquirer's leverage, perhaps for the same reason as previously explained.

3.1.2 Impact of Diversity on Performance after Accounting for Bank Efficiency and Risk

As is usual in the bank acquisition literature, we account for the impact of post-acquisition efficiency gains. We also ascertain if the efficiency gains are increasing in the diversity of the acquisition deal. If the increase in post-acquisition returns is associated with a disproportionate increase in risk, then this would not be beneficial to shareholders. Hence, we also account for risk. We include several measures of risk in the various models. The first measure is the total risk of the combined entity in the post-acquisition period. We also include the Fama-French risk factors–the return on the small minus big (SMB) and high minus low book-to-market value (HML) portfolios, as well as the market return in excess of the risk-free rate (RMRF). Data for these variables are obtained from Kenneth French's web page. Finally, given the evidence that bank stock returns are sensitive to interest rates (e.g., Flannery and James (1984)), we include the change in the Federal funds rate over the post-acquisition period. The risk measures are computed for each acquisition over the same three-year period used to estimate the post-acquisition return.

To provide further insights into the effect of bank diversification on post-acquisition returns, we also include a geographic diversification indicator variable (*geography*), defined as one if the acquirer bank and the target are not headquartered in the same state and zero otherwise. It is possible that the diversifying bank acquisitions in our sample are really motivated by the desire to obtain geographic diversification rather than diversification into nonbanking business. Suppose a bank holding company headquartered in Texas seeks geographic diversification of its earnings stream. It may choose to acquire a bank in, say, New York, a distinctly different economic region of the country. However, while assessing the opportunities it discovers an investment bank for sale in New York. Although outside of the core banking business the bank holding company figures that there is enough commonality between the two businesses to warrant acquisition. In this scenario, the geographic diversification motive coincides with the motivation to diversify across business lines. The upshot is that introducing this geographic diversification measure into the model might render the existing measures of diversity insignificant.

We estimate the following model:

$$\bar{R}_{it,t+3} = \delta_0 + \delta_1 Efficiency_i + \delta_2 Bank/IB_i + \delta_3 Bank/Insurance_i + \delta_4 Efficiency_i \times Bank/IB_i + \delta_5 Efficiency_i \times Bank/Insurance_i + C'Controls_i + e_i . \quad (2)$$

Efficiency is the profit efficiency measure in the post-acquisition period. The risk proxies–total risk, SMB, HML, RMRF, and the change in the federal funds rate–and the geographic diversification dummy are included in the control variables in the model. In this model, for the sake of parsimony, relative to the models in the previous table, we omit the target characteristics and include only those of the acquirer. Results for the full model containing all independent variables are qualitatively and quantitatively similar to those reported, and are available on request. The specific control variables in the model are shown in the results and described in detail in Appendix A.

The results are reported in Table 4. (Note 7) Despite accounting for risk and bank efficiency we continue to find that the post-acquisition annualized average return on the combined entity is increasing in diversity. That is, relative to bank-bank acquisitions, the annualized, risk-adjusted post-acquisition return is significantly higher by about 97 basis points when banks acquire investment banks and by about 83 basis points when they acquire insurance companies.

Table 4. Post-Acquisition Returns, Systematic Risk, and Diversity in Bank Acquisition

This table reports results from regressing the cross-section of annualized average post-acquisition returns of acquirer banks on measures of diversity in bank acquisitions, bank profit efficiency, and various measures of systematic risk. Post-acquisition annualized returns are computed using three years of returns. Firm characteristics are those of the acquirer and are described in the data appendix. The usable sample consists of bank acquisitions over the period November 1999 to December 2002. ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

Variable	model i	model ii	model iii	model iv	model v	model vi
Intercept	-0.2829***	-0.2730***	-0.2701***	-0.2106***	-0.2058***	-0.1882***
Profit Efficiency	0.6510***	0.6394***	0.6203***	0.5993***	0.5784***	0.5901***
Bank/IBank dummy		1.0087**	0.9984**	0.9646**	0.9579**	0.9211**
Bank/Insurance dummy		0.8638*	0.8470*	0.8121*	0.7999*	0.8015*
Profit Effic.*Bank/IBank		0.6485***	0.6389***	0.5947***	0.5503***	0.5901***
Profit Effic.*Bank/Insurance		0.6412***	0.6277***	0.5730***	0.5717***	0.5934***
Financial Leverage				-0.8336*	-0.7742	
Cash			0.1007*	0.0859*	0.0814*	0.9895*
Cost of Sales			-0.2635	-0.2254	-0.1946	-0.2341
Non-Operating Expense				0.0659	0.0501	
Total Risk				0.1537	0.1358	
ROA			0.0209			0.0184
Total Assets				0.4472**	0.0772**	
Equity Payment				0.4341	0.4156	
RMRF						0.8277***
SMB						0.2910**
HML						-0.0776*
Federal Funds Rate					-0.0092	-0.0079
Geography dummy					0.7733	0.7294
Year		Yes	Yes	Yes	Yes	Yes
Merger coeff. diff (*t*-stat)		(2.22)**	(2.19)**	(2.13)**	(2.12)**	(1.97)**
Number of Observations						
Used	353	320	316	254	254	316
P-Value (*F*-test)	(<.0001)	0.0030	0.0057	0.0065	0.0050	(<.0001)
Adjusted R^2	0.4230	0.5024	0.5622	0.5863	0.6073	0.7186

There are several other interesting results in the various models. First, consistent with the existing literature (e.g., Berger et al. (2000), Vander Vennet (2002)), a part of the post-acquisition stock performance is attributable to the efficiency of the combined entity. Thus, it appears that acquirer banks with efficient practices are able to transfer these efficiencies to the less efficient targets. This is consistent with Berger and Mester (2003) who find that profit productivity improves significantly after acquisition.

Second, the gains in post-acquisition returns arising from bank efficiency increase with the diversity of the transaction. The evidence indicates that when banks acquire either investment banks or insurance companies the efficiency effects on post-acquisition returns roughly doubles relative to when banks acquire other banks. These results suggest that the management skills required to transform efficiency differentials between acquirer and target in a bank-bank acquisition into value for shareholders are transferable to nonbank acquisitions. They do not support the argument that efficiency gains are likely to be the greatest when two merged entities are in the same line of business. Neither, do they support the idea that the most efficient banks are more likely to expand in their area of specialization (banking) and outperform those that diversify into new activities (investment banking and insurance).

Third, several of the risk factors are statistically significant. Interestingly, these are the Fama-French factors and not the interest rate factor, as might have been expected, or the total risk factor. The evidence also suggests that the

nonbank diversification is distinct from the geographic diversification which, incidentally, is not significant. Overall, the underlying substantive implication of these results is that investors benefit by way of higher risk-adjusted returns from bank diversification across nonbank business lines.

3.2 Robustness Tests of the Impact of Diversity on Post-acquisition Returns

To further ensure the robustness of the above results, we conduct several additional tests.

3.2.1 Operational Efficiency and Post-acquisition Returns

We estimate the models using operational (cost), instead of, profit efficiency to get some insight as to whether the effect of profit efficiency on post-acquisition returns is due solely to the revenue or the cost component. The unreported evidence indicates that operational efficiency has a positive, statistically significant, and economically important effect on post-acquisition returns although, not unexpectedly, profit efficiency has greater explanatory power and economic significance. This is consistent with the results of Rhoades (1998) who finds modest cost efficiency gains after bank acquisitions using data from the early 1990s. The impact of diversity on post-acquisition returns is not materially different from those using the profit efficiency measure. Overall, these results suggest that the impact of efficiency gains on post-acquisition stock returns is not driven solely by a revenue effect.

3.2.2 Alternative Diversity Dummy

Bank managers might not regard the acquisition of insurance companies as a more diverse transaction than the acquisition of investment banks relative to the core business of banking. Instead, they might regard either as potentially equally capable of providing adequate diversification to their core banking operations. This would be consistent with evidence that while bank performance is enhanced by the merger of commercial and investment banks without a commensurate increase in risk, others find that commercial bank mergers with insurance firms provide better risk reduction (see evidence in Vander Vennet (2002)). Therefore, we define a dummy variable as one if a bank acquires either an insurance company or an investment bank and zero if it acquires another bank. We do not tabulate the results (but models using this dummy are reported below in Table 5). The inferences are not materially different from those of the previous models. Across the different specifications, banks that acquired nonbank businesses have about 110 basis points higher post-acquisition annualized average return than banks that acquired other banks.

3.2.3 Excluding Serial Acquirers

We dropped all banks with multiple acquisitions and re-estimate the models with the subsample of banks with only a single acquisition. This ensures that we can clearly attribute any impact on post-acquisition performance to a single type of acquisition. In addition, the results are not affected by acquisitions that were previously announced as part of an ongoing acquisition program and, therefore, are anticipated by investors (James and Wier (1987)). Furthermore, evidence in Moeller et al. (2004) and others show that serial acquirers ultimately underperform and so this could affect the above inferences.

The results (not tabulated) are not materially different. Banks that acquire investment banks had about 90 basis points annualized returns higher than banks that acquired other banks. Similarly, banks acquiring insurance companies had about 75 basis points higher post-acquisition return. These results suggest that, while serial acquirers' performance boosts the performance of the overall set of acquirers, perhaps because of the benefit of learning, it did not unduly influence the overall performance.

3.2.4 Endogeneity and Post-acquisition Returns

The result that stock price performance increases with diversification could be driven by endogeneity (simultaneity bias) if banks that have experienced high stock returns choose to engage in diversifying acquisitions. We doubt that this is the case for several reasons. First, having controlled for various characteristics of the acquirer bank, if there were some characteristic that drives well-performing banks to diversify it is likely that we would have controlled for it. Likewise, because we control for target characteristics, it is likely that we have accounted for the possibility that some financial firms make themselves attractive targets for acquisition by well-performing banks. Second, we accounted for the method of payment because it could be argued that managers of banks that have experienced strong stock price performance may be more inclined to use their equity as currency for acquisitions. Third, we control for geographic diversification in case out-of-state acquisitions help managers to develop some skill that is transferrable to nonbank acquisitions.

Nevertheless, we use a two-stage-least-squares (2SLS) model to account for the simultaneity bias. In the first stage we estimate a probit model in which the dependent variable is whether the acquirer bank engages in a diversifying

acquisition or in the acquisition of another bank. To facilitate the estimation of a probit model we use the single diversity measure used in the robustness test above–one if the bank acquires an investment bank or an insurance company and zero if it acquires a bank. Following Laeven and Levine (2007) and others, we instrument the diversity dummy with a dummy defined as one if the acquirer is in the S&P500 index because that would lead to greater liquidity for the acquirer's stocks and, hence, higher relative market values. This would enable greater use of stocks as currency for diversifying acquisitions. On the other hand, being in an index should not impact post-acquisition returns. The first-stage model also contains various other variables previously defined. In the second stage the dependent variable is banks' post-acquisition returns, while the independent variables are the predicted probability of diversifying acquisition and the variables included in the first-stage regressions.

The second-stage results are reported in Table 5. The finding that post-acquisition stock returns increase with diversity does not change. Banks that engage in diversifying acquisitions earn, on average, more than 100 basis points higher annualized post-acquisition return than their peers that acquire other banks. Hence, these results are consistent with the claim that diversifying acquisitions cause higher post-acquisition returns than more focused acquisitions. Overall, the above results provide robust evidence that banks' post-acquisition stock returns are increasing with the diversity of their acquisition transactions.

Table 5. 2SLS Estimate of the Impact of Diversity on Post-Acquisition Stock Returns of Acquirer Banks

This table reports results from the second-stage regression of a 2SLS model of the cross-section of annualized average post-acquisition returns of acquirer banks on a single measure of diversity in bank acquisitions. The bank diversity dummy is defined as one if a bank acquires either an investment bank or insurance company, and zero otherwise. In the first-step regression we include the instrument, a dummy variable defined as one if the acquirer is included in the S&P500 index and zero otherwise plus the exogenous variables in the models reported below. The usable sample consists of bank acquisitions over the period November 1999 to December 2002. ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

	model i	model ii	model iii	model iv	model v	model vi	model vii	model viii	model ix	model x
Intercept	2.1306***	2.7215***	2.4701***	3.1327***	0.2648***	0.3198***	1.5623***	2.6057***	0.2664***	0.3932***
Bank/Diversity Merger	1.0555**	1.0074**	1.0218**	1.0331**	1.0843**	1.0921**	1.1370**	0.96856**	1.8764**	1.0672**
Acquirer Assets	0.6669*	0.6274*	0.6317*				0.6754*	0.6297*	0.6214**	0.5375**
Acquirer Cash		0.1543*	0.1195*					0.1488*		0.1014*
Acquirer Cash Flow	0.1001*			0.0932*		0.1067*	0.1105*			
Acquirer Cost of Sales	-0.2065		-0.221						-0.1732	-0.1843
Acquirer Financial Leverage	-1.0753*	-1.0213*			-1.0424*	-0.9764*	-1.1719*	-1.1053*		-1.0634*
Acquirer Net Sales					0.0682**			0.0673**	0.0676**	
Acquirer Return on Equity							7.1123	5.1054		
Non-Operating Income Exp				-0.0642	-0.0556	-0.0485				
Target Assets				0.1277*	0.1354*	0.1224*			0.1379*	0.1328*
Target Cash Flow			0.2004*		0.1966*	0.1913*	0.2213*			0.2409*
Target Financial Leverage			-0.8429*	-0.8112*		-0.7950*	-0.8686*		-0.8657*	-0.8284*
Target Net Sales	0.3161*	0.2876*		0.3158*			0.3215*	0.3220*	0.3301*	0.3284*
Target Return on Assets		0.0007		0.0006				0.0011	0.0007	0.001
Target Return on Investment		0.0031			0.0028		0.0027			0.0024
Equity Payment				0.5485		0.5271			0.5873	
Geography		0.0898				0.0802		0.09		0.0799
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of Obs. Used	230	230	230	254	264	254	264	264	254	275
Adjusted R^2	0.7553	0.7931	0.8012	0.7674	0.7834	0.7676	0.8056	0.8194	0.7896	0.7769

3.3 Does the Market Like Diversity?

In this section we examine whether, at the time of the announcement of an acquisition, the market has a favorable view of acquisitions that seek to diversify into nonbank segments. The previous results can be regarded as an indication that the optimism that the market displayed in its response to the announcement of the passing of the GLBA was not misplaced. The question now, therefore, is whether investors displayed that same optimism when banks announced their intention to actually seek diversification via acquisitions in the post-GLBA period. Hence, we examine if abnormal returns associated with the announcement of acquisitions are increasing in the diversity of the acquisition deal.

Given that simulation results show that simple methods are as effective as more complex methods in detecting abnormal returns (Brown and Warner's (1985)), we compute benchmark-adjusted returns on announcement day (t=0)

for the acquiring banks by subtracting a benchmark return from the acquirer's return. We then compute the abnormal return for equally weighted portfolios (AR_p) discussed below:

$$AR_{p,t} = \frac{1}{N}\sum_{i=1}^{i=N}(R_{i,t} - R_{B,t}), \quad (3)$$

where $R_{i,t}$ is the return on acquirer bank i on the announcement day t, $R_{B,t}$ is the return on a benchmark portfolio, and N is the number of acquirer banks (see, e.g., Ziobrowski et al. (2004)).

Table 6 reports the average announcement-day abnormal return. We report the results for all bank acquisitions and separate results for bank-bank, bank-investment bank, and bank-insurance acquisitions. For completeness, we also report similar results for the two days surrounding the announcement date, t-1 and t+1. To determine whether the market responds favorably to diversifying bank acquisitions we compute abnormal returns relative to two benchmarks. The first benchmark is the return on announcement day t on an equally weighted index of all banks that did not have an acquisition announcement on day t. (Note 8) The second is the return on the equally weighted market index from CRSP.

Table 6. Acquisition-Announcement Day Abnormal Returns

This table reports average announcement-day abnormal returns (in %) of U.S. bank acquisitions stratified by the diversity of the acquisition deal. Abnormal returns are computed relative to the announcement-day return on an equally weighted index of banks that did not have an acquisition announcement on that day (Panel A) or to the return on the CRSP equally weighted market index (Panel B). ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively, using the z-test. The sample period is November 12, 1999 to December 31, 2002.

Panel A: Nonevent Banks Benchmark	N	Day -1	Day 0	Day +1
All bank acquisitions	353	0.004	0.053	0.032
		(0.50)	(1.04)	(0.78)
Bank/commercial bank acquisitions	273	0.003	0.049	0.029
		(0.39)	(0.89)	(0.71)
Bank/IBank acquisitions	58	0.006	0.102	0.019
		(1.01)	(2.03)**	(1.63)
Bank/insurance company acquisitions	22	0.002	0.093	0.008
		(0.42)	(1.86)*	(1.35)
Panel B. Market Benchmark	**N**	**Day -1**	**Day 0**	**Day +1**
All bank acquisitions	353	0.001	0.041	0.004
		(0.49)	(1.31)	(0.98)
Bank/bank acquisitions	273	0.001	0.033	0.004
		(0.38)	(1.28)	(0.88)
Bank/IBank acquisitions	58	0.001	0.084	0.004
		(1.03)	(1.73)*	(1.07)
Bank/insurance company acquisitions	22	0.004	0.059	0.008
		(0.99)	(1.67)*	(1.19)

The results in Panel A, where the benchmark is the portfolio of nonevent banks, indicate that on the date of the announcement of an acquisition the full sample of acquiring banks does not experience a statistically significant abnormal return. This is consistent with the overall result, from a survey of the literature on industrial firms, that bidders on average do not lose (or gain) from mergers (Jensen and Ruback (1983)). Breaking out the sample by the different types of acquisitions indicates that this result is driven by the subsample of bank-bank acquisitions. In contrast, we find that for bank acquisitions of investment banks and acquisitions of insurance companies there is a statistically significant and positive one-day abnormal return of 10.2 and 9.3 basis points, respectively.

To the best of our knowledge, this is the first evidence that bank bidders earn positive abnormal returns after announcing acquisitions of nonbank firms in the post-GLBA period. The positive and significant abnormal returns are similar to, though smaller in magnitude than, the results in James and Wier (1987), who report a 2-day CAR of 1.07% by banks acquiring other banks or to the results in Asquith, Bruner, and Mullins (1983) who find a 2-day CAR of 1.2% for bidders in industrial mergers. The results in Panel B, where the benchmark is the equally weighted market index, corroborate the above findings, although the economic magnitude of the abnormal returns is a bit smaller.

These results indicate that investors welcome the opportunity offered to banks to diversify their earnings stream and reward managers with higher equity prices for actualizing these opportunities. The results are broadly consistent with studies that find that joint production within banking (e.g., Berger, Hancock, and Humphrey (1993)) or within banking and insurance services is more efficient for some firms (Berger, Cummins, Weiss, and Zi (1999)). Consistent with our previous results, investors' response to the announcements seems to reflect the view that bank managers are somewhat out of their zone of competence when they operate in the insurance industry.

The above univariate results imply that investors do not consider the acquirer, target, or deal characteristics when responding to the loan announcements. Instead, the assumption is that only the target's identity, specifically its perceived unrelatedness to the acquirer, influences the abnormal returns. This is unlikely to be the case as, for instance, acquirer banks with certain characteristics may be perceived to have greater capacity to transform the potential in the acquisition to actual wealth for investors. Hence, we regress the abnormal returns on the diversity dummy variables and control variables, reflecting the characteristics of the acquirer, the target, and the transaction, that could influence the market's response to the announcement:

$$AR_i = b_0 + b_1 Bank/IB_i + b_2 Bank/Insurance_i + C'Controls_i + e_i. \quad (6)$$

The results in Table 7, when the benchmark portfolio is the portfolio of non-event banks, indicate that after accounting for several control variables abnormal returns significantly increase with diversity. Specifically, when commercial banks acquire investment banks and insurance companies the mean abnormal returns are about 11 and 8 basis points, respectively, higher than when they acquire other commercial banks. Hence, the market perceives that diversification leads to higher future returns.

Table 7. Acquisition-Announcement Day Abnormal Returns and Acquisition Diversity

This table reports results from regressing the cross-section of acquisition-announcement day abnormal returns of acquirer banks on measures of diversity in bank acquisitions. The benchmark return is that of the portfolio of nonevent banks. Firm characteristics are described in the data appendix. The usable sample consists of bank acquisitions over the period November 1999 to December 2002. ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

Variable	model i	model ii	model iii	model iv	model v	model vi	model vii	model viii	model ix	model x
Intercept	0.4405***	0.5049***	0.4563***	0.4516***	0.4685***	0.5235***	0.5099***	0.4378***	0.4269***	0.4172***
Bank/IBank	0.0973***	0.1002***	0.0988***	0.0901**	0.0955**	0.0997***	0.1108***	0.1307***	0.1321***	0.0965***
Bank/insurance co.	0.0781**	0.0789**	0.0823**	0.0833**	0.0871**	0.0807**	0.0797**	0.0967**	0.0986**	0.0767**
Target assets	0.5839**	0.5883**	0.5766**	0.5947**	0.6210**					0.4573*
Target fin. Leverage	-0.2882*			-0.3015*	-0.3088*		-0.3429*	-0.3532*		-0.2645*
Target ROA	0.0007			0.0009		0.0016			0.0014	0.0006
Target ROI		0.0027	0.0021			0.0036		0.0039		0.0020
Target cash flow		0.0583	0.0609		0.0524		0.0506	0.0622		0.0539
Target net sales	0.0638**			0.0595**		0.0702**		0.0734**	0.0748*	0.0574*
Acquirer assets	0.5744*					0.6730*	0.5871*	0.5997*	0.6096*	0.5004*
Acquirer fin. Leverage			-0.0848*		-0.1032*	-0.1175*		-0.0921*	-0.1212*	-0.0293
Acquirer net sales	0.1035**	0.1066**	0.0994**						0.1130**	
Acquirer cash						0.2384*	0.2442*		0.2501*	0.2120*
Acquirer cash flow				0.0066	0.0072			0.0078		
Acquirer ROA		0.7340						0.8109	0.8724	
Acquirer cost of sales	-0.0485	-0.0436					-0.0583			-0.0397
Geography					0.0021	0.0043			0.0049	0.0017
Non-oper. inc. expense			-0.0385	-0.0398	-0.0437					
Equity payment	0.0687	0.0702		0.0732	0.0825					
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Merger coeff. diff. (t-stat)	(1.98)**	(2.01)**	(1.99)**	(1.79)*	(1.88)*	(2.09)**	(2.05)**	(2.10)**	(1.92)*	(2.07)**
Number of observations	254	228	264	254	254	230	230	264	264	275
P-value (*F*-test)	0.0114	0.0138	0.0119	0.0121	0.0128	0.0142	0.0139	0.0105	0.0097	0.0085
Adjusted R^2	0.6700	0.6494	0.6683	0.6602	0.6545	0.6298	0.6331	0.6756	0.6783	0.7142

3.4 Do Bank Managers Pay More for Diversity?

In this subsection we examine whether the cross-sectional variation in premiums paid by bank managers to acquire banks and other financial firms is significantly related to the diversification provided by the acquisition deal. That is, we use the acquisition premiums to provide insights into how managers of acquiring banks perceive the opportunity provided by the GLBA to expand into nonbanking activities relative to expanding their banking product via the acquisition of other banks.

To examine this issue we estimate the following model (Note 9):

$$\text{Premium}_i = b_0 + b_1 Bank/IB_i + b_2 Bank/Insurance_i + C' Controls_i + e_i . \quad (7)$$

Table 8 reports the results. There is support for the hypothesis that bank managers pay higher premiums for diversity. Specifically, banks pay a marginally significantly higher premium of about 65 basis points for investment banks than for other banks. However, there is no significant difference in the average premiums paid for acquiring insurance companies and acquiring other banks. This is broadly consistent with the argument by Rhoades (2000) that there could be a lack of synergy between banks and insurance companies, although it contrasts with studies that find that joint production within both banking and insurance companies is more efficient for some firms (Berger, Cummins, Weiss, and Zi (1999)). It appears that managers have discounted for this potential lack of synergy by paying a premium no more than what they pay for acquiring other banks, even though the acquisition of banks does not provide the same diversification benefits as offered by the acquisition of insurance companies.

Table 8. Acquisition Premiums and Acquisition Diversity

This table reports results from regressing the cross-section of acquisition premiums (in %) on measures of diversity in bank acquisitions. Diversity in acquisition is captured by dummy variables defined as one where a U.S. commercial bank acquires, respectively, a U.S. target that is 1) a commercial bank, 2) an investment bank, or 3) an insurance company, and zero otherwise. The usable sample consists of bank acquisitions over the period November 1999 to December 2002. ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

Variable	model i	model ii	model iii	model iv	model v	model vi	model vii	model viii	model ix	model x
Intercept	1.936**	1.347	1.724*	1.877**	2.001**	1.995**	1.495	1.235*	1.333	1.224*
Bank/ IBank	0.575*	0.710*	0.693*	0.834**	0.576*	0.519*	0.639*	0.587*	0.681*	0.596*
Bank/ Insurance Company	0.099	0.103	0.120	0.145*	0.105	0.087	0.114	0.093	0.117	0.102
Target Assets	0.700*	0.695*	0.739**	0.758	0.760**					0.665
Target Financial Leverage	-0.403**		-0.415**	-0.408**			-0.480***		-0.475**	-0.332*
Target ROA	0.061			0.070		0.064		0.061		0.054
Target ROI		-0.004			-0.004	-0.005			-0.003	-0.003
Target Cash Flow		0.483**	0.479**		0.444**		0.471**		0.450**	0.415**
Target Net Sales	0.639**			0.641***		0.605**		0.536**	0.592**	0.615**
Acquirer Assets	0.790**					0.894***	0.912***	0.805**	1.003***	0.732**
Acquirer Fin. Leverage			-0.724*		-0.934**	-0.863**		-0.770**	-0.693*	-0.730**
Acquirer Net Sales	1.217	3.205**			2.220*			-1.996		
Acquirer Cash						7.802	6.289	7.773		7.529
Acquirer Cash Flow			19.593	17.023		15.299			13.008	
Acquirer ROA		-9.995						-10.786	-8.579	
Acquirer cost of sales	-14.202	-12.425					-10.835			-12.828
Non-Oper. Expense			-22.489	-19.994	-16.547					
Geography		0.019*			0.020*			0.021*		0.012*
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Merger coeff. diff (t-stat)	(1.93)*	(1.87)**	(1.62)	(1.76)*	(1.83)*	(2.05)**	(1.88)*	(1.47)	(2.02)**	(1.83)*
Number of observations	275	229	264	275	264	230	230	260	264	263
P-value (*F*-test)	0.0048	0.0050	0.0062	0.0066	0.0052	0.0058	0.0043	0.0030	0.0072	0.0052
Adjusted R^2	0.850	0.671	0.536	0.508	0.681	0.664	0.627	0.895	0.527	0.879

The payment of a higher premium for the diversity offered by investment banks may be because the imperfectly correlated cash flows of the acquirer and the target arising from the merger reduce the variability in aggregate cash flows (Lewellen (1971), Stulz (1990)). This coinsurance is important not only to bondholders, but may also be important to shareholders (Hermalin and Katz (2003)). These results provide some support for the shareholder-wealth-enhancement hypothesis of Benston et al. (1995) and not the deposit insurance put-option-enhancement hypothesis. However, the support for this hypothesis is not overwhelming in that the premium does not monotonically increase in the diversity of the deal. (Note 10)

Several of the control variables are significant and the coefficient estimates have signs that are consistent with economic intuition. For instance, larger acquirers generally pay higher acquisition premiums, consistent with the finding by Moeller et al. (2004) that transaction value is significantly related to the size of the acquiring firm. Acquirers' financial characteristics also explain the cross-sectional variation in premiums, as acquirers with greater financial leverage tend to pay lower acquisition premiums. This perhaps reflects the difficulty of financing acquisitions with further debt, consistent with the literature that finds that acquiring firms' inability to finance the deal adversely affects the deal's value (Palia (1993), Moeller et al. (2004)). Similarly, targets' characteristics, such as size, net sales, cash flows, and financial leverage, also influence the premium paid. Targets with these characteristics seem more likely to create value for the combined entity because they can benefit more from efficiency gains or their unutilized borrowing capacity can be exploited.

Overall, the positive and significant relationship between acquisition premiums and the diversity offered by the acquisition of investment banks indicates that managers perceive the opportunity to diversify banks' earnings as an important part of their operations and are willing to pay higher premiums to realize these opportunities. The evidence indicates that these acquisitions help to maximize shareholders' wealth.

4. Summary and Conclusions

The GLBA allows commercial banks to diversify their income stream by offering nonbanking services, such as investment banking and insurance services. However, there are contradicting theoretical predictions about the effect of diversity in bank operations on bank performance. Hence, bank acquisitions in the post-GLBA period provide a unique opportunity to empirically examine this issue.

Assuming that diversification increases as banks acquire other banks, investment banks, and insurance companies, this paper examines the value of diversification on bank stock price performance. First, we examine if the post-acquisition annualized average stock return of banks increases in the diversity of the banks' acquisition deals.

The evidence indicates that post-acquisition stock performance increases with diversity. That is, commercial bank acquisition of investment banks is associated with about 97 basis points higher annualized average risk-adjusted return than the return associated with the acquisition of other banks. However, there is not a monotone increase in returns as the acquisition of insurance firms is associated with a risk-adjusted increment of about 83 basis points. These results are robust to accounting for alternative measures of bank efficiency, omission of serial acquirer banks from the sample, controlling for various bank-specific, business condition, and systematic risk variables, and accounting for endogeneity.

Given the evidence that post-acquisition returns increase with diversity we examine whether this is perceived by investors at the time of the announcement of the acquisition deal and, as such, whether announcement-day abnormal return increases with diversity. We find that abnormal return on the announcement of all bank acquisitions is insignificantly different from zero. This is driven by an insignificant response to the announcement of the acquisition of other banks. In contrast, the abnormal returns on the announcement of bank acquisition of investment banks and insurance companies are statistically significant, at 11 and 8 basis points, respectively, when we control for the form of payment and various other factors that could affect the abnormal return.

Finally, we test two hypotheses to examine how the target's earnings diversification potential impacts the acquisition premium. The shareholder-wealth-enhancement hypothesis holds that managers diversify to maximize shareholders' wealth through earnings diversification. As such, the premiums are expected to increase in the degree of the diversity of the acquisition. The deposit insurance put-option-enhancement hypothesis holds that managers use the opportunity to diversify in order to increase the value to bank managers of the put option provided by deposit insurance. That is, managers diversify to become "too big to fail." Therefore, managers pay larger premiums for entities whose earnings are more highly correlated with the earnings of the bank; as such, premiums should be higher for the acquisition of other banks than for the acquisition of nonbank financial firms. We find support for the wealth-enhancement hypothesis as the premium for bank acquisition of investment banks is significantly higher than that for acquisition of other banks. However, premiums do not increase monotonically with diversity as the premium paid to acquire insurance companies is not significantly different from that to acquire other banks. This implies that managers are concerned about paying high premiums to diversify into a line of business outside of their competence zone.

The results have several implications. First, they provide support for advocates of the GLBA given public concern about the role of the Act in the recent financial crisis. Second, they have implications for how we view the outcomes of banks' diversifying acquisitions. Future research efforts could be directed at whether diversified banks displayed greater capacity to withstand the recent financial crisis.

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Appendix A Data Description

Variable name	Definition
Profit efficiency	The profit efficiency measure uses the distribution-free method. To obtain this measure, we estimate the profit function using data on 2,214 financial institutions with continuous and complete annual data for the seven-year period from 1999 through 2005. Given the results of these estimations, we then calculate the profit efficiency measure for each acquirer and target financial institution using the distribution-free method, which distinguishes efficiency differences from random error by averaging the profit function residuals over time.
Operational efficiency	Operational efficiency is defined as the ratio of operating expenses to the total assets of the financial institution.
Premium	Premium is defined as (price paid for the target - accounting book value of target's equity)/price paid for target.
Diversity	Diversity in acquisition is captured by dummy variables defined as one where a U.S. commercial bank acquires, respectively, a U.S. target that is 1) a commercial bank, 2) an investment bank, or 3) an insurance company, and zero otherwise.
Total assets	natural log of total assets at time of the acquisition
Financial leverage	book value of debt to total assets at the time of the acquisition
Operating expense	the cost of goods sold for operations
Net sales	gross sales minus returns, discounts, and allowances
Cash	total book value of cash at the time of the acquisition
Cash flow	change in cash availability over the year prior to the acquisition
Return of assets (ROA)	net income/total assets at the time of the acquisition
Return on investment (ROI)	net profits less taxes divided by total assets
Cost of Sales (COS)	cost of goods sold plus any expenses incurred in the selling and delivery of the product or service
Non-operating income expense	expense incurred in performance of activities not directly related to the main business of the firm
Equity payment	a dummy variable defined as one if the acquisition is paid for using the acquirer's equity and zero otherwise
Year	a dichotomous variable representing the year of the acquisition
Transaction value	the total purchase price the acquiring bank pays for other financial companies
Total risk	standard deviation of acquisition bank's three-year post-acquisition returns, represented by standard deviation of 36 post-acquisition monthly returns multiplied by the square root of 36
Geography dummy	a binary variable equal to 1 if the acquirer and target are not headquartered in the same state and zero otherwise
Federal funds rate	the change in the U.S. Fed funds rate over the three-year post-acquisition period for each bank acquisition
RMRF	market return in excess of the risk-free rate over the post-acquisition period
SMB	return on small firms minus returns on big firms over the post-acquisition period
HML	return on high book-to-market value portfolios minus return on low book-to-market value portfolios over the post-acquisition period

SDC provides the financial leverage ratio and not the dollar amounts. Thus I took the average ratio times the average Total Assets to get the Financial Leverage. For the Total Debt, I did the individual firms financial leverage ratio times the individual Total Assets and got the individual Total Debt Dollar amount. I'm not sure why they are different, but hopefully this addresses minor comments 1 & 2.

I have done everything else the reviewer one suggested just as suggested with some minor enhancements. Specifically, the Benchmark portfolio for BV table one is both the S&P returns and a bank matching sample. The S&P had a -9% return over the period and I did not know if that impacted the results, thus I created a banking benchmark. I also did the entire study over to include the new total debt and NASDAQ/ NYSE variables.

Notes

Note 1. Overall, they find "a substantial and persistent…" discount generally among financial intermediaries.

Note 2. Rhoades (2000) suggests that these are increasingly unrelated businesses. He argues that although the GLBA will lead to some cross-industry mergers between banks on the one hand and investment banks and insurance companies on the other, mergers between banks and insurance companies are likely to be few because of the lack of synergies between these entities. See Brewer et al. (1988), Wall et al. (1993), and Boyd et al. (1993) for a different view.

Note 3. See Geyfman and Yeager (2009, f.n. 4) for an example of apparent regret about the passing of the GLBA.

Note 4. See Berger (1993) for a complete description of the distribution-free efficiency measure.

Note 5. It is worth pointing out that we do not examine if there is an *abnormal* return in the post-acquisition period resulting from the decision to diversify. That is, we do not attempt to estimate an expected return relative to some benchmark and then determine if acquirers' returns are above or below the expected return (see, for instance, Rau and Vermaelen (1998)). Instead, we examine whether actual returns after the event, without concern for whether they are abnormal, are influenced by the diversity of a previous acquisition deal.

Note 6. This is broadly similar to the argument that a firm that is highly productive in an activity faces a higher opportunity cost of diversifying into another activity than a less productive firm (Maksimovic and Phillips (2002)).

Note 7. In unreported models we also simultaneously include the total risk proxy, the Fama-French systematic risk factors, and the interest rate measure. This allows the total risk proxy to control for any idiosyncratic risk component of the post-acquisition return. The main results do not change with these different combinations of risks. These and all other results that are not tabulated in the paper are available from the authors on request.

Note 8. Since the acquirers are all banks, we do not include other financial firms in the benchmark portfolio because that could lead to biased results. For instance, if it included insurance firms and on day t they experienced negative returns while banks had positive returns, this would lower the benchmark return and overstate the abnormal return.

Note 9. We assume that the same basic set of control variables used in previous tests influence the acquisition premium. The evidence suggests that models of the acquisition premiums are well-specified as the adjusted R^2s range from about 50% to 88%.

Note 10. It is possible that managers use diversification to eliminate employment risk (Amihud and Lev (1981)). The results suggest that this is not the case; otherwise they would be willing to pay the highest premiums for the transactions that afforded them the greatest diversification. Interestingly, the results imply that this is one situation in which the interests of managers and shareholders coincide.