Non-Traditional Banking Activities and Bank Financial Reporting Quality

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Abstract

We examine whether and how non-traditional banking activities affect the quality of banks' financial reporting. We find that a bank's ratio of non-interest income (derived from non-traditional activities) to total operating income is positively and significantly associated with the magnitude of discretionary loan loss provisions, our proxy for financial reporting quality.

Keywords: Banking; Non-Interest Income; Earnings Quality; Discretionary Loan Loss Provisions

JEL classification codes: G21; M41

1. Introduction

The recent financial crisis (2007-2009) triggered bank failures in the U.S. and around the world. In an attempt to understand the causes of the bank failures, many commentators blamed business models that extended bank's portfolios to non-traditional services. Traditionally, the main source of revenue for U.S. banks was the interest generated from their deposits taken and loans made. However, over the past few decades, the banking sector has steadily expanded its non-interest income, including fee service income and trading revenue. The speed of such an expansion has increased since 1999, when the U.S. Congress passed the Gramm-Leach-Bliley Act to allow banks to engage more in non-traditional activities, such as investment banking, advisory services, security brokerage, underwriting fees and commissions, and asset securitization. Although banks may benefit from diversification by engaging in these activities, they also take on risks because complex firms are difficult to monitor and discipline given their increased powers and information asymmetries (Barth et al. 2004). Commentators have also argued that bank supervisors were lax and most likely unprepared for the challenges of deregulated financial markets (DeYoung and Torna 2013). As a result, following the financial crisis, the Dodd-Frank Wall Street Reform and Consumer Protection Act was signed into U.S. federal law by U.S. President Barack Obama on July 21, 2010, to restrict activities, such as proprietary trading, which may have contributed to the financial crisis.

Despite dramatic changes in the bank product mix and a series of laws passed to deregulate and then re-regulate the non-traditional banking activities over the past two decades, the implications for financial reporting of banks engaging in traditional and non-traditional activities have received scant attention from researchers.[1] Given that financial reporting is an essential way of assessing a bank's

[1] Non-traditional banking activities include fiduciary activities, service charges on deposit accounts, investment banking, advisory services, brokerage, underwriting fees and commissions, net servicing fees, net securitization income, insurance commission fees and income, and trading activities.

economic condition, the efficiency of bank supervision would be affected if different levels of engagement in non-traditional activities are associated with different levels of bank reporting quality. Therefore, in this study, we examine the relation between banks' activities and their financial reporting behaviors, and try to understand whether and how the shift from traditional to non-traditional activities affects bank financial reporting quality.

Bank managers will want to manage earnings for the purpose of income smoothing and maximizing compensation. The motivations of earnings management are the driving forces that provide understanding of why banks with non-interest income are expected to manage earnings. When banks start to manage earnings, they should choose the part of earnings that are relatively easy to manage or manipulate. For example, non-interest income has more potential for managers to manage or manipulate. However, interest income does not have much potential for management or manipulation simply because interest rates in loan or mortgage contracts are fixed numbers and cannot be changed. Therefore, the earnings management motivation would be stronger for banks with more non-traditional earning activities and such banks have a greater ability to conceal their earnings management.

Existing theories and evidence provide conflicting predictions about the influence of engaging in non-traditional activities on bank financial reporting quality. Two arguments support the hypothesis that expanding non-traditional activities improves the quality of banks' financial reporting. The first argument is that banks' accounting numbers may be a better estimate of their financial condition when banks gain more private information on their loan quality through regular interactions with their clients in the provision of financial services (Boot 2000; Demirguc-Kunt and Huizinga 2010; Abedifar et al. 2015). The second argument is that bank managers may have fewer incentives to manipulate earnings to the extent that combining fee-based income with loan-based income helps to reduce overall earnings volatility from what it would be for loan-based income alone. This argument is based on the conjecture that fee-based

activities are less sensitive to movements in interest rates and economic downturns, and that they imperfectly covary with earnings from traditional banking products (DeYoung and Roland 2001).

Rebuttals to these arguments lead to an opposite prediction that the expansion of non-traditional activities decreases the quality of banks' financial reporting. First, non-traditional activities add to bank complexity, leading to greater information asymmetry between bank managers and external stakeholders (Deng et al. 2007; Jiraporn et al. 2008). It is thus presumably more difficult for outsiders to scrutinize a bank's earnings reports. Moreover, bank managers may exploit this information asymmetry and engage in more earnings manipulation (for example, to maximize their compensation which is tied to bank earnings). Second, empirical observations suggest that fee-based income need not be more stable than loan-based income. Revenue from a bank's traditional lending activities may be more stable over time than revenue from some fee-based activities; switching costs and information costs make it costly for either borrowers or lenders to walk away from a lending relationship, whereas banks face strong competitive rivalry, low information costs, and less stable demand in several other product markets (e.g., investment advice, mutual fund and insurance sales, and data processing services) (DeYoung and Roland 2001).

Following Demirguc-Kunt and Huizinga (2010) and Saunders et al. (2016), we use the ratio of non-interest income to total operating income to represent a bank's reliance on non-traditional activities. We then separate non-traditional activities into fee-based activities and trading activities. Our primary measure of bank financial reporting quality is the discretionary component of loan loss provisions (LLP), which is the fundamental accrual for bank performance (Beatty and Liao 2014). Discretionary loan loss provisions (DLLP) are used for opportunistic earnings management (Perez et al. 2008; Kanagaretnam et al. 2010). Our sample encompasses the 1993–2012 period, covering three market regimes: pre-crisis (1993–2006), crisis (2007–2009), and post-crisis (2010–2012).

Our results indicate that the ratio of non-interest income to total operating income is associated with a greater magnitude of DLLP, suggesting that replacing traditional with non-traditional activities in a portfolio of banking products is associated with greater earnings management. This finding holds in all three sub-periods. As the U.S. banking system is dominated by private banks, we divide our sample into public and private banks. This finding holds more significantly among private banks because public banks are usually more closely monitored by market participants. Therefore, engaging in non-traditional activities to manage earnings brings public banks under greater scrutiny. After decomposing non-interest income into fee-based and trading income, we find a positive and significant relationship between the magnitude of unsigned DLLP and fee-based income. Fee-based income comes from fiduciary activities, service charges on deposit accounts, underwriting fees and commissions, net servicing fees, net securitization income, insurance commission fees and income, and other kinds of non-interest income. However, we do not find any significant association between DLLP and trading income.

Our paper has several implications for research and policy. To our knowledge, little empirical research in the U.S. has considered the implications of a bank's choice of activities for its financial reporting quality. We extend the prior literature on the relationship between corporate complexity (or diversification) and financial reporting quality to the banking industry. Unlike firms in other industries, banks engage in activities such as lending, investment banking, and insurance underwriting, the impact of which has been insufficiently studied in the accounting literature. Our study is related to the work of DeYoung and Roland (2001), who examine the effects of mixing a variety of bank activities on bank profitability and earnings volatility between 1988 and 1995. However, our research extends the DeYoung and Roland (2001) analysis by capturing different dimensions of accounting quality, including accruals manipulation and accounting conservatism, and by subjecting the relationship between financial reporting quality and fee income to new market regimes.

The remainder of this paper is organized as follows. Section 2 reviews the literature and develops our hypothesis. Section 3 explains our research design, including the measures and choices of empirical models. Section 4 describes our sample selection process. Section 5 discusses our main results. Section 6 provides robustness checks. Section 7 presents our conclusions.

2. Literature Review and Hypothesis Development

Our research is related to the line of literature that focuses on the costs and benefits of banks' engagement in non-traditional activities. On the positive side, Saunders and Walters (1994) find that expanding banks' activities reduces risk and that the risk-reduction gain arises mainly from insurance activities, not from securities activities. Deng et al. (2007) document that non-traditional bank activities reduce the cost of debt, while Mester (2010) finds that banks whose portfolios expand into non-traditional activities experience high economies of scale and benefits. Isidro and Grilo (2012) find that fee income from services such as asset management, loan issues, and credit guarantees is the most important value-creating activity for European banks, especially for the smaller ones. Apergis (2014) documents that non-traditional banking activities have a positive effect on both profitability and insolvency risk. Abedifar et al. (2015) highlight that higher income from fiduciary activities lowers the credit risk for banks with total assets from $100 million to $1 billion, suggesting that fiduciary activities induce more prudent bank lending behavior because such activities increase banks' franchise value. Saunders et al. (2016) document that a higher ratio of non-interest income (derived from fees, investment banking, venture capital, and trading) to interest income (deposit taking and lending) is associated with higher profitability and lower failure probability.

On the negative side, Stiroh (2002) shows that greater reliance on non-interest income, particularly trading income, is associated with higher risk and lower risk-adjusted profits. Laeven and Levine (2007)

find that the market values of financial institutions that engage in both lending and non-lending activities are lower than those of the financial institutions that engage in financial intermediaries specializing in individual activities. Lepetit et al. (2008) highlight that banks engaging in more non-interest income activities incur higher risk and higher insolvency risk than do banks that mainly supply loans. Brunnermeier et al. (2012) document that banks with higher non-interest income (non-traditional activities like investment banking, venture capital, and trading activities) have a greater contribution to the industry's systemic risk than banks with traditional banking income (deposit-taking and lending). DeYoung and Torna (2013) show that the probability of bank failure increases with increasing reliance on asset-based nontraditional activities such as venture capital, investment banking and asset securitization. Thus, prior literature notes that there are both costs and benefits associated with expansion into non-traditional banking activities.

Based on the existing theories and evidence, we conclude that there might be conflicting predictions about how the degree of engagement in non-traditional activities may influence bank accounting quality. On the one hand, conducting non-traditional activities such as trading and fee-based services may arguably improve banks' accounting quality because banks can gain private customer-specific information by providing non-traditional services such as securities underwriting in addition to the traditional loan-making activities to the same customer, thereby mitigating asymmetric information problems (Boot 2000; Demirguc-Kunt and Huizinga 2010; Abedifar et al. 2015). The inside information gained would improve banks' estimates about their clients' financial position; consequently, banks' accounting numbers such as loan loss provisions and non-performing loans should be a better reflection of their loan quality. The conventional wisdom among many bankers and bank regulators also holds that fee-based earnings are more stable than loan-based earnings to the extent that the former are less sensitive to movements in interest rates and economic downturns (DeYoung and Roland 2001). Given that non-

interest earnings covary imperfectly with earnings from traditional banking products, combining non-interest and interest income reduces overall earnings volatility via the diversification effect (Demirguc-Kunt and Huizinga 2010), thereby providing fewer incentives for bank managers to smooth earnings.

At the same time, there is an opposite prediction that expansion of non-traditional activities decreases bank's financial reporting quality. For instance, non-traditional activities add to bank complexity, leading to greater information asymmetry between bank managers and external stakeholders (Deng et al. 2007; Jiraporn et al. 2008). Bank managers may thus exploit this information asymmetry and engage in more earnings manipulation to decrease the quality of financial reporting. Several studies show that agency costs stemming from exacerbated information asymmetries outweigh the benefits of activity diversification (Laeven and Levine 2007; Elyasiani and Wang 2009; Akhigbe and Stevenson 2010).

In addition, the literature shows that shifts to non-interest and fee-based income from traditional interest income increase the volatility of bank earnings. For example, DeYoung and Roland (2001) argue that, because of switching costs and information costs, it is difficult for banks or their clients to exit a lending relationship. However, banks face high competitive rivalry, low information costs, and less stable demand in the fee-based markets (e.g., investment advice, mutual fund and insurance sales, and data processing services), making interest income more stable than non-interest income over time. Moreover, a bank that has established a lending relationship will incur only variable costs to increase the amount of credit extended to a current customer. In contrast, expansion to fee-based activities will require the input of fixed costs of additional labor, increasing the bank's operating leverage for banks with more non-traditional banking revenues. In return, the higher ratio of fixed-to-variable expenses will translate into greater revenue volatility and greater earnings volatility (DeYoung and Roland 2001).

Finally, banks are not typically required to hold capital against most fee-based activities. The lack of a regulatory capital requirement suggests a higher degree of financial leverage and higher earnings

volatility for these lines of business (DeYoung and Roland 2001). If so, bank managers would have more incentives to manipulate accounting numbers to smooth their earnings than would otherwise be the case if the bank were restricted to traditional loan-based activities.

Given these competing arguments, the association between a bank's non-traditional activities and its financial reporting quality is an empirical question. Thus, our hypothesis is stated as follows:

Hypothesis: A bank's income from non-traditional activities is associated with its earnings management and financial reporting quality.

3. Research Design

Following Demirguc-Kunt and Huizinga (2010), in our main test we use the ratio of non-interest income (broadly capturing non-traditional activities) to total operating income (capturing both traditional and non-traditional banking activities) to measure the relative size of non-traditional activities in a portfolio of banking products. In supplementary tests, we investigate the impact of different types of non-interest income, such as trading income and fee-based income, on bank financial reporting quality (Saunders et al. 2016).

Our primary measure of bank financial reporting quality is the magnitude of the discretionary component of loan loss provisions (LLP). Banks use discretionary loan loss provisions (DLLP) for opportunistic earnings management and that DLLP increases the propensity of restating financial reports and the receipt of SEC comment letters (Ahmed et al. 1999; Beatty and Liao 2014; Kanagaretnam et al. 2010; Kanagaretnam et al. 2015). Perez et al. (2008) find that Spanish banks use LLPs to smooth earnings. In addition, Barth and Landsman (2010) argue that loan loss provisions may have contributed to the financial crisis through their effects on procyclicality and on the effectiveness of market discipline.

Our construction of DLLP relies on the two best-performing LLP models identified by Beatty and Liao (2014). Specifically, we first estimate the OLS regression models using equations (1a) and (1b). The residuals of the regressions are treated as DLLP, and their absolute values are our main proxy for the quality of bank financial reporting.

$$LLP_{it} = \alpha_0 + \alpha_1 \Delta NPL_{it+1} + \alpha_2 \Delta NPL_{it} + \alpha_3 \Delta NPL_{it-1} + \alpha_4 \Delta NPL_{it-2} + \alpha_5 SIZE_{it-1} + \alpha_6 \Delta LOAN_{it} + \alpha_7 \Delta ST\_GDP_{it} + \alpha_8 \Delta ST\_HPI_{it} + \alpha_9 \Delta ST\_UR_{it} + DUM\_ST + DUM\_YR + \varepsilon_{it} \quad (1a)$$

$$LLP_{it} = \alpha_0 + \alpha_1 \Delta NPL_{it+1} + \alpha_2 \Delta NPL_{it} + \alpha_3 \Delta NPL_{it-1} + \alpha_4 \Delta NPL_{it-2} + \alpha_5 SIZE_{it-1} + \alpha_6 \Delta LOAN_{it} + \alpha_7 \Delta ST\_GDP_{it} + \alpha_8 \Delta ST\_HPI_{it} + \alpha_9 \Delta ST\_UR_{it} + \alpha_{10} LLA_{it-1} + DUM\_ST + DUM\_YR + \varepsilon_{it} \quad (1b)$$

where LLP is loan loss provisions divided by beginning total loans; ΔNPL is the change in non-performing loans divided by beginning total loans; $SIZE$ is the natural logarithm of total assets; $\Delta LOAN$ is the change in total loans divided by beginning total assets; ΔST_GDP is the change in GDP of the state where the bank's headquarters is located; ΔST_HPI is the change in the return of the house price index of the state where the bank's headquarters is located; ΔST_UR is the change in the state unemployment rate of the state where the bank's headquarters is located; and LLA is the loan loss allowance divided by total loans. The difference between equations (1a) and (1b) is that Equation (1b) contains an additional variable *LLA*, which controls the level of loan loss allowance.

We denote the absolute values of the residuals obtained from equations (1a) and (1b) as $ABSDLLP\_A$ and $ABSDLLP\_B$ and use them as the proxy for bank financial reporting quality in our main test. The higher the values of $ABSDLLP\_A$ and $ABSDLLP\_B$, the lower the financial reporting quality of banks. To test the impact of non-traditional activities on bank financial reporting quality, we estimate the OLS regression models using equations (2a) and (2b).

$$ABSDLLP\_A_{it} = \alpha_0 + \alpha_1 NII_{it} + \alpha_2 SIZE_{it} + \alpha_3 LOAN_{it} + \alpha_4 CAPR_{it} + \alpha_5 ROA_{it} + \alpha_6 NPL_{it} + \alpha_7 ASG_{it} + \alpha_8 PUBLIC_{it} + DUM\_YR + \varepsilon_{it} \quad (2a)$$

$$ABSDLLP\_B_{it} = \alpha_0 + \alpha_1 NII_{it} + \alpha_2 SIZE_{it} + \alpha_3 LOAN_{it} + \alpha_4 CAPR_{it} + \alpha_5 ROA_{it} + \alpha_6 NPL_{it} + \alpha_7 ASG_{it} + \alpha_8 PUBLIC_{it} + DUM\_YR + \varepsilon_{it} \quad (2b)$$

where $ABSDLLP\_A$ and $ABSDLLP\_B$ are the absolute values of discretionary LLP from equations (1a) and (1b), respectively. Our main variable of interest is the non-interest income variable NII, defined as the ratio of non-interest income to total operating income. If non-traditional activities are associated with higher earnings management, we expect a positive and significant coefficient of NII. However, if non-traditional activities are related to lower earnings management, the coefficient of NII will be negative and significant at conventional levels. The control variable *ASG* is the growth of total assets.

Following Altamuro and Beatty (2010) and Kanagaretnam et al. (2014), we control for bank size (*SIZE*) and public ownership (*PUBLIC*) because larger banks and public banks are more likely to manage earnings to avoid reporting a decline in earning (Beatty et al., 2002). We control for return on assets (*ROA*) and leverage ratio (*CAPR*) since managerial incentives to engage in earnings management and capital management are associated with profitability and capital adequacy (e.g., Bushman and Williams, 2012; Beatty and Liao, 2014). We control for loans (*LOAN*) and non-performing loans (*NPL*) because these loan characteristics may affect nondiscretionary changes in earnings (Beatty et al., 2002).

4. Sample and Data

We obtain data on commercial banks' financial information from the Call Reports. We are not aware of any bias in selecting public and private banks, as both public and private banks in the U.S. are required to file Call Reports. The Call Reports data have been used by Beatty and Liao (2011), Bushman and Williams (2012), and Bushman and Williams (2015).

Our sample consists of 148,778 bank-year observations for 12,284 U.S. public and private banks for 1993-2012. The sample covers three sub-periods: the 14 years preceding the financial crisis (1993–2006), the three years of the financial crisis (2007–2009), and the three years following the financial crisis

(2010–2012). All bank-level continuous variables are winsorized at the top and bottom 1 percentile to mitigate the effects of any outliers.

Table 1 provides the descriptive statistics for the variables used in the regression analyses. The mean values of the magnitude of DLLP ($ABSDLLP\_A$ and $ABSDLLP\_B$) are both 0.002. As for the main variable of interest (NII), we find that the average non-interest income share of total operating income is 0.110, comparable to the values documented in prior banking literature (e.g., Saunders et al. 2016). The distribution of non-interest income share is between 0.059 (1st quartile) and 0.138 (3rd quartile). These values indicate that the U.S. banking system relies more heavily on traditional interest income activities than on non-traditional non-interest income activities. As for the control variables, we find that the mean of $LOAN$ is 0.610, suggesting that 61% of bank assets are in the form of bank loans, consistent with the argument that the traditional loan-making (i.e., interest income) activities have a predominant role in banking businesses.

[Insert Table 1 here]

Table 2 presents the Pearson correlation matrix of the dependent and independent variables. We find that the non-interest income share (NII) is positively and significantly correlated with $ABSDLLP\_A$. In addition, NII is negatively and significantly correlated with $LOAN$, consistent with the observation that banks with more loans have less operating income generated from non-interest income activities. In addition, NII is negatively and significantly correlated with $CAPR$, in line with the argument that banks are not required to establish high capitalization against non-interest income activities, such as investment banking, advisory, and underwriting, to stay solvent (DeYoung and Roland 2001). Finally, NII is positively and significantly correlated with ROA, ASG, and $PUBLIC$, suggesting that non-interest income is associated with greater bank profitability and bank growth during our sample period, and that public banks have a higher share of non-interest income than private banks. Consistent with Haubrich and Young

(2019), we find that public banks carry a higher share of non-interest income than private banks. We believe that large public banks can reduce their overall earnings volatility by diversifying their revenue streams and engaging more in non-traditional activities, such as investment banking, advisory services, security brokerage, underwriting fees and commissions, and asset securitization (Barth et al. 2004).

[Insert Table 2 here]

5. Regression Results

Table 3 presents the regression results for estimating DLLP using equations (1a) and (1b). In Panel A, we find that the coefficients of ΔNPL_{it+1} and ΔNPL_{it} are significantly positive (t-value = 3.26 and 36.54, respectively). In Panel B, we find that the coefficients of ΔNPL_{it+1} and ΔNPL_{it} are significantly positive (t-value = 6.74 and 38.43, respectively). The results suggest that banks use forward-looking information on non-performing loans, which are less discretionary and more timely in estimating LLP. Both panels A and B show that the coefficients of ΔNPL_{it-1} and ΔNPL_{it-2} are significantly positive as well, indicating that banks also use past non-performing loan information to estimate LLP. The positive and significant coefficient of $\Delta LOAN$ is consistent with the argument that LLP is higher when the bank extends credit to more clients with lower quality (Beatty and Liao 2014).

[Insert Table 3 here]

Table 4 presents the baseline multivariate regression results for our prediction. Our main variable of interest is the non-interest income share, i.e., NII. We find that NII is positively and significantly associated with both $ABSDLLP\_A$ and $ABSDLLP\_B$ at the 1% level (t-value = 16.87 and 17.04, respectively), suggesting that engagement in non-traditional banking activities increases banks' earnings management. This finding supports the argument that non-traditional activities create additional bank complexity, leading to greater bank information asymmetry. With regard to the control variables, we find

that $SIZE$, $LOAN$, $CAPR$, NPL, and ASG are positively and significantly correlated with $ABSDLLP\_A$ and $ABSDLLP\_B$, indicating that larger banks, and those banks with more loan making, a higher equity capital ratio, more non-performing loans, and a higher growth rate engage in more earnings management. In contrast, we find that ROA and $PUBLIC$ are negatively associated with $ABSDLLP\_A$ and $ABSDLLP\_B$, implying that public banks and more profitable banks conduct less earnings management than their counterparts.

[Insert Table 4 here]

It is possible that banks with low financial reporting quality engage in complicated financial activities or services to conceal their earnings management behaviors. If this is the case, the OLS regression results documented above are subject to the endogeneity concern of reverse causality. We use the instrumental variable approach to address this concern. Following Demirguc-Kunt and Huizinga (2010), we use a vector of dummy variables that represent different bank types as instruments for the level of banks' engagement in non-traditional activities. Banks differ materially in their income structures, and a bank's type can dramatically affect its income structure because each type is guided by a specific charter that outlines the allowed and disallowed bank activities (Demirguc-Kunt and Huizinga 2010). For example, non-banking credit institutions might not be allowed to engage in investment banking activities, which limits their potential to generate fee income. Among our sample banks, we identify six bank categories based on their charter types (RSSD9048): commercial bank, non-deposit trust company, savings bank, savings and loan association, cooperative bank, and industrial bank. We then create five independent bank-type dummy variables for each bank. This means that we have dummy variables representing whether a bank is a commercial bank, a non-deposit trust company, a savings bank, a savings and loan association, or a cooperative bank. We use these five dummy variables as instruments for banks' non-interest income share. Our first-stage regression takes the following form:

$$NII_{it} = \alpha_0 + \alpha_1 SIZE_{it} + \alpha_2 LOAN_{it} + \alpha_3 CAPR_{it} + \alpha_4 EBTP_{it} + \alpha_5 NPL_{it} + \alpha_6 ASG_{it} + \alpha_7 PUBLIC_{it} + DUM\_TP + DUM\_YR + \varepsilon_{it} \quad (3)$$

where NII is the ratio of non-interest income to total operating income and DUM_TP is a vector of dummy variables representing different bank charter types (i.e., commercial bank, non-deposit trust company, savings bank, savings and loan association, and cooperative bank). *EBTP* is defined as net earnings before income taxes and loan loss provisions.

In the second stage, we re-estimate the effect of non-traditional activities on DLLP using the fitted values from Equation (3) to capture the exogenous variation in the non-interest income share. Our second-stage regression models are as follows:

$$ABSDLLP\_A_{it} = \alpha_0 + \alpha_1 PREDNII_{it} + \alpha_2 SIZE_{it} + \alpha_3 LOAN_{it} + \alpha_4 CAPR_{it} + \alpha_5 EBTP_{it} + \alpha_6 NPL_{it} + \alpha_7 ASG_{it} + \alpha_8 PUBLIC_{it} + DUM\_YR + \varepsilon_{it} \quad (4a)$$

$$ABSDLLP\_B_{it} = \alpha_0 + \alpha_1 PREDNII_{it} + \alpha_2 SIZE_{it} + \alpha_3 LOAN_{it} + \alpha_4 CAPR_{it} + \alpha_5 EBTP_{it} + \alpha_6 NPL_{it} + \alpha_7 ASG_{it} + \alpha_8 PUBLIC_{it} + DUM\_YR + \varepsilon_{it} \quad (4b)$$

where $ABSDLLP\_A$ and $ABSDLLP\_B$ are the absolute value of discretionary LLP from equations (1a) and (1b), respectively. $PREDNII$ is the predicted value of NII from Equation (3).

Table 5 presents the results of the instrumental variable analysis. Panel A tabulates the first-stage regression results. As expected, bank types have a significant impact on their non-interest income activities. Specifically, we find that non-deposit trust companies have a significantly higher non-interest income share, whereas savings banks and cooperative banks have a significantly lower non-interest income share. Panel B tabulates the second-stage regression results. We find that the predicted value of *NII* (*PREDNII*) from the first stage is positively and significantly associated with $ABSDLLP\_A$ and $ABSDLLP\_B$ at the 1% level (*t*-value = 16.03 and 15.57, respectively). This finding complements our baseline regression results that reliance on non-interest income is associated with greater bank earnings management and lower bank earnings quality.

[Insert Table 5 here]

6. Additional Analysis

In this section, we begin by examining whether the relationship between non-traditional activities and financial reporting quality differs between public and private banks. Public and private banks arguably have different earnings management incentives. Shareholders of public firms have less private access to corporate information and rely more on publicly available financial information, such as reported earnings (Burgstahler et al. 2006). To the extent that shareholders are reluctant to supply capital to banks with low accounting quality, public banks have stronger incentives to provide transparent earnings to help external shareholders to assess economic performance. Beatty et al. (2002) argue that the shareholders of public banks are more likely than those of private banks to rely on simple earnings-based methods in evaluating bank performance, thereby expecting public banks to have more incentives to manage earnings.

Boards of directors normally use earnings per share and stock returns to determine chief executive officers' (CEO) annual salaries, bonuses, and stock options. Net earnings and/or earnings per share directly impact CEOs' personal wealth, which provides incentives to manage earnings. Privately owned banks are not an exception to that proclivity of CEOs to manage earnings. CEOs of private banks also depend on net earnings or earnings per share to determine their annual compensation and job security. Prior literature presents empirical evidence that managers manipulate net earnings in order to increase the value of their incentive-based compensation packages. For example, CEOs' equity incentives influence accruals management and the likelihood of beating analysts' forecasted earnings (Cheng and Warfield, 2005; Bergstresser and Philippon, 2006). Thus, it is reasonable to posit that both private banks and public banks care about managing earnings and have incentives to smooth earnings given their CEOs' propensity to maximize their personal compensation.

While bank managers have discretion in reporting loan loss provisions, accounting discretion ultimately reflects the differential costs and benefits perceived by them. The cost of engaging in earnings management is higher for public banks than for private banks. Public banks are more closely monitored by federal regulators and auditors, especially after the 2007-2008 financial crisis. Evidence suggests that the SEC monitors and oversees corporate earnings management. In September 1998 the SEC, the New York Stock Exchange, and the National Association of Security Dealers organized a blue-ribbon committee to strengthen the role of audit committees in overseeing the corporate financial reporting process (SEC Press Release, 1998). The SEC and Internal Revenue Service are responsible for investigating public banks that have committed financial reporting violations and tax frauds. The Dodd-Frank Act of 2010 requires bank holding companies with more than $50 million in assets to abide by stringent capital and liquidity standards and sets new restrictions on incentive compensation. These stringent bank regulations after the 2007-2008 financial crisis may have reduced the incentives and opportunities of managers of public banks to manipulate earnings. In addition, compared to private banks, public banks are supervised by SEC, which closely monitors the firm's accounting quality and issues comment letters upon detecting a potential deficiency in an accounting treatment.

Compared to small private banks, publicly traded banks have more complex corporate governance mechanisms. Effective corporate governance has been shown to deter banks from engaging in opportunistic earnings management. For example, Cornett et al. (2009) show that U.S. banks with greater board oversight and lower levels of CEO pay-for-performance sensitivity exhibit less earnings management. Therefore, we predict that the positive relation between non-interest income and the magnitude of discretionary loan loss provisions is more pronounced among private banks than among public banks.

We provide the results of regressing $ABSDLLP\_A$ and $ABSDLLP\_B$ on NII for public banks and private banks in panels A and B of Table 6, respectively. Panel A shows that the coefficient of NII for the sample of public banks is 0.001, which is marginally significant at the 10% level, in both $ABSDLLP\_A$ and $ABSDLLP\_B$ regressions among public banks. In Panel B, among private banks, the coefficient becomes 0.003, which is significant at the 1% level (t-value = 16.88 and 17.05, respectively). Further analysis reveals that the difference in the coefficient of NII between the two groups of banks is statistically significant (t-value = -5.88 and -5.74), suggesting that non-traditional activities encourage earnings management more in private banks than in public banks. This finding is consistent with the argument that the transparency expectation of public listing status mitigates the incentives of banks to manipulate reported earnings by exploiting banking activities.

[Insert Table 6 here]

In the main tests, our sample encompasses the period from 1993 to 2012, consisting of 14 pre-crisis years (from 1993 to 2006), three crisis years (from 2007 to 2009), and three post-crisis years (from 2010 to 2012). We also investigate the relationship between non-traditional activities and bank financial reporting quality for the three sub-periods separately. Untabulated results document a significantly positive relationship between NII and $ABSDLLP\_A$ and $ABSDLLP\_B$ across all three sub-periods, suggesting that the positive relationship between non-interest income share and bank earnings management was not changed by the 2007–2009 financial crisis.

Next, we decompose non-traditional banking activities based on their types and investigate whether the relationship documented in the main tests holds for two different types of non-interest income. The first type is fee-based activity, proxied by the ratio of income from fiduciary activities, service charges on deposit accounts, investment banking, advisory, brokerage, and underwriting fees and commissions, net servicing fees, net securitization income, insurance commission fees and income, and other non-

interest income to total operating income. The second type is trading activity, proxied by the ratio of trading income to total operating income. We estimate the OLS regression models using equations (5a) and (5b).

$$ABSDLLP\_A_{it} = \alpha_0 + \alpha_1 FEE_{it} + \alpha_2 TRAD_{it} + \alpha_3 SIZE_{it} + \alpha_4 LOAN_{it} + \alpha_5 CAPR_{it} + \alpha_6 EBTP_{it} + \alpha_7 NPL_{it} + \alpha_8 ASG_{it} + \alpha_9 PUBLIC_{it} + DUM\_YR + \varepsilon_{it} \quad (5a)$$

$$ABSDLLP\_B_{it} = \alpha_0 + \alpha_1 FEE_{it} + \alpha_2 TRAD_{it} + \alpha_3 SIZE_{it} + \alpha_4 LOAN_{it} + \alpha_5 CAPR_{it} + \alpha_6 EBTP_{it} + \alpha_7 NPL_{it} + \alpha_8 ASG_{it} + \alpha_9 PUBLIC_{it} + DUM\_YR + \varepsilon_{it} \quad (5b)$$

where $ABSDLLP\_A$ and $ABSDLLP\_B$ are the absolute value of discretionary LLP from equations (1a) and (1b), respectively; FEE is the ratio of fee-based income to total operating income, and $TRAD$ is the ratio of trading income to total operating income.

Panel A of Table 7 reports the relationship among bank earnings management, fee-based activities, and trading activities. The positive and significant coefficient of FEE suggests that greater expansion into fee-based activities increases banks' earnings management. However, the coefficient of $TRAD$ is insignificant, indicating that trading activities do not have a significant impact on banks' earnings management behaviors.

In 1999, the U.S. Congress passed the Gramm-Leach-Bliley Act, generating exogenous shocks to fee-based income. The act repealed certain regulations under the Glass-Steagall Act of 1933 and the Bank Holding Company Act of 1956 that had restricted banks from the securities and insurance underwriting business. The Gramm-Leach-Bliley Act of 1999 loosens the restrictions on banks' abilities to engage in securities underwriting activities and permits banks to underwrite insurance policies (Lown et al. 2000). Thus, we expect that, following the passage of the Gramm-Leach-Bliley Act, banks should have more flexibility in employing fee-based income to affect external financial reporting. We test this prediction by running the following OLS regression models within the timeframe of 1994 to 2003.

$$ABSDLLP\_A_{it} = \alpha_0 + \alpha_1 FEE_{it} + \alpha_2 FEE_{it} * POST_{it} + \alpha_3 TRAD_{it} + \alpha_4 TRAD_{it} * POST_{it} + \alpha_5 SIZE_{it} + \alpha_6 LOAN_{it} + \alpha_7 CAPR_{it} + \alpha_8 ROA_{it} + \alpha_9 NPL_{it} + \alpha_{10} ASG_{it} + \alpha_{11} PUBLIC_{it} + DUM\_YR + \varepsilon_{it} \quad (6a)$$

$$ABSDLLP\_B_{it} = \alpha_0 + \alpha_1 FEE_{it} + \alpha_2 FEE_{it} * POST_{it} + \alpha_3 TRAD_{it} + \alpha_4 TRAD_{it} * POST_{it} + \alpha_5 SIZE_{it} + \alpha_6 LOAN_{it} + \alpha_7 CAPR_{it} + \alpha_8 ROA_{it} + \alpha_9 NPL_{it} + \alpha_{10} ASG_{it} + \alpha_{11} PUBLIC_{it} + DUM\_YR + \varepsilon_{it} \quad (6b)$$

where $ABSDLLP\_A$ and $ABSDLLP\_B$ are the absolute value of discretionary LLP from equations (1a) and (1b), respectively; FEE is the ratio of fee-based income to total operating income, and $POST$ is a dummy variable that equals 1 for the years 1999 to 2003, and 0 for the years 1994 to 1998. The primary variable of interest is the interaction term $FEE * POST$. Given the prediction that, following the passage of the Gramm-Leach-Bliley Act of 1999, banks would increase their capacity to employ fee-based income to affect reported earnings, we expect the coefficient of $FEE * POST$ to be significantly positive. As a comparison, we also include the interaction term $TRAD * POST$. As the Gramm-Leach-Bliley Act targets fee-based rather than trading activities, we expect that the capacity of banks engaged in trading activities to influence earnings quality should not change — so the coefficient of $TRAD * POST$ should not be significantly different from 0.

Panel B of Table 7 reports the regression results for the impact of the Gramm-Leach-Bliley Act. The coefficient of the interaction term $FEE * POST$ is positive and significant at the 1% level (*t*-value = 3.20 and 2.59, respectively), which is consistent with the argument that the passage of the Gramm-Leach-Bliley Act increases banks' capacity to employ fee-based income to manage earnings. In contrast, the coefficient of $TRAD * POST$ is not significant at the 10% level, in line with the observation that trading activity is not the target of the Gramm-Leach-Bliley Act of 1999.

[Insert Table 7 here]

Our results are potentially subject to endogeneity issues. It is possible that banks with low financial reporting quality engage in complicated financial activities or services to conceal their earnings management behaviors. If this is the case, the OLS regression results documented above are subject to the endogeneity concern of reverse causality. To resolve the endogeneity issues, Gow et al. (2016) and Meyer

(1995) encourage researchers to exploit quasi-natural experiment settings such as the passage of laws and identify the causal impact using a difference-in-differences design strategy. Following Gow et al. (2016), we identify the causal impact of non-traditional banking activity on bank financial reporting quality by exploiting the passage of the Gramm-Leach-Bliley Act (GLBA) as an exogenous policy change.

Evidence suggests that the GLBA of 1999 loosened the restrictions on banks' abilities to engage in securities underwriting activities and permitted banks to underwrite insurance policies (Lown et al. 2000). The onset of GLBA diversifies the business model of banks, increasing the share of non-interest income. Thus, the passage of GLBA is an exogenous shock to the non-traditional banking activities, allowing us to examine the causal impact of non-interest income on a bank's earnings quality. We expect that, following the passage of the GLBA, banks with a dramatic increase in non-interest income should experience an increase in the magnitude of discretionary loan loss provisions and hence a decrease in financial reporting quality.

Following the empirical difference-in-differences design of Chen, Huang and Zhang (2017), we rank all banks in each year based on their non-interest income ratio into three groups with equal numbers and designate banks in the highest (lowest) non-interest income group as treated (control) banks. We also define the GLBA dummy variable as 1 if the year is 2000 and after, and 0 if the year is 1999 and before. We estimate the following regression model:

$$ABSDLLP\_A(B)_{it} = \beta_0 + \beta_1 Treated_i * Post_t + CONTROLS + FIXED\ EFFECTS + \varepsilon_{it} \quad (7)$$

where $ABSDLLP\_A(B)_{it}$ is the absolute value of discretionary *LLP* from Equations 1a (1b) for bank i during year t. *Treated* equals 1 if the bank's non-interest income is in the highest tercile and 0 if it is in the lowest tercile. *Post* is a dummy variable that equals 1 for years 2000-2010 when the Gramm-Leach-Bliley Act became effective, and 0 for years 1993-1999. Our main variable of interest is the interaction term *Treated∗Post*. We predict coefficient β_1 on this interaction term to be significantly positive, reflecting

a significant increase in accounting discretion during the post-Gramm-Leach-Bliley Act period relative to the control banks with limited exposure to the regulation change.

Table 8 reports the results of the difference-in-differences regressions. Models 1 and 2 of Table 8 show that the coefficient on *Treated*∗*Post* is positive and statistically significant at the 1% level (t-value = 3.96 and 3.79, respectively), suggesting that after the implementation of GLBA, banks with higher exposure to GLBA have a greater magnitude of discretionary loan loss provisions than the banks in the control sample.

[Insert Table 8 here]

7. Conclusion

In this paper, we investigate whether and how non-traditional banking activities affect bank financial reporting quality. We use the ratio of non-interest income (broadly from non-traditional activities) to total operating income (from both traditional and non-traditional banking activities) to measure a bank's reliance on non-traditional activities. Using a panel of U.S. banks during the 1993–2012 period, we find that the ratio of banks' non-interest income to total operating income is positively and significantly associated with the magnitude of DLLP, suggesting that an increased share of non-traditional activities in a portfolio of banking products decreases bank earnings quality. We then decompose non-traditional banking activities into investment banking fee income and trading income to analyze their impact. Although we find a positive and significant relationship between the magnitude of DLLP and fee income, we do not find any significant association between DLLP and trading income. Thus, it is plausible to reason that the impact of non-traditional activities on bank earnings quality is driven primarily by investment banking fee-based activities. Consistent with this plausibility, we find that the impact of fee

income (rather than trading income) on bank earnings management increased following the Gramm-Leach-Bliley Act of 1999.

As alternative measures, we also find that a higher non-interest income share reduces the timeliness of banks' loss recognition and increases bank exposure to asset deterioration (i.e., higher levels of LLP and more loan charge-offs). These findings are in line with DeYoung and Roland's (2001) arguments that engaging in non-traditional activities exacerbates moral hazard problems, weakens bank capitalization, and creates more volatile revenues, thereby providing incentives for bank managers to manipulate accounting numbers. Our results lend support to the current practices of American and European regulators regarding either ring-fencing or prohibiting certain non-core banking activities.

Our results lend support to the current practices of American and European regulators regarding either ring-fencing or prohibiting certain non-core banking activities to manage risks in banks and control systemic risks in the financial system. Future research could investigate further the composition of bank revenue streams and their impact on the various stakeholders. Such studies would be valuable to regulators in various oversight bodies to uphold public interest.

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Appendix A
Variable Definitions

Dependent Variables	
$ABSDLLP\_A_{it}$	The absolute value of discretionary loan loss provisions for bank *i* in year t, calculated as the absolute value of the residuals from the OLS regression of Equation (1a).
$ABSDLLP\_B_{it}$	The absolute value of discretionary loan loss provisions for bank *i* in year t, calculated as the absolute value of the residuals from the OLS regression of Equation (1b).
Variables of Interest	
NII_{it}	Non-interest income scaled by total operating income for bank *i* in year t.
FEE_{it}	Fee-based income scaled by total operating income for bank *i* in year t.
$TRAD_{it}$	Trading income scaled by total operating income for bank *i* in year t. *TRAD = NII - FEE*
Other Bank-Level Variables	
$PRED\_NII_{it}$	Predicted non-interest income scaled by total operating income for bank *i* in year t.
$SIZE_{it}$	Natural logarithm of total assets for bank *i* in year t.
$LOAN_{it}$	Total loans scaled by total assets for bank *i* in year t.
$CAPR_{it}$	Total equity scaled by total assets for bank *i* in year t.
$EBTP_{it}$	Earnings before income taxes and loan loss provisions for bank *i* in year t.
ROA_{it}	Net income for bank *i* during year t scaled by beginning total assets.
NPL_{it}	Non-performing loans scaled by total loans for bank *i* in year t.
ASG_{it}	Growth in total assets for bank *i* during year t.
$PUBLIC_{it}$	A dummy variable that equals 1 for a public bank, and 0 otherwise.
ΔNPL_{it}	Change in non-performing loans for bank *i* during year t scaled by beginning total loans.
LLP_{it-1}	Loan loss provision scaled by total loans for bank *i* in year $t-1$.
LLA_{it-1}	Loan loss allowance scaled by total loans for bank *i* in year $t-1$.
$\Delta LOAN_{it}$	Change in loans for bank *i* during year t scaled by beginning total assets.
Macro-Level Variables	
$POST_{it}$	A dummy variable that equals 1 for years 1999-2002, and 0 for years 1995-1998.
ΔST_GDP_{it}	Change in GDP of the state of the bank's headquarter for bank *i* during year t.
ΔST_HPI_{it}	Change in the return of the house price index of the state of the bank's headquarter for bank *i* during year t.
ΔST_UR_{it}	Change in the state unemployment rate of the state of the bank's headquarter for bank *i* during year t.

Appendix B
Summary of Research Hypotheses

Predictions	Economic mechanisms
Non-traditional activities increase banks' accounting quality.	Non-traditional services provide banks with private customer-specific information. Banks' accounting numbers better reflect their customers' loan quality.
	Non-interest income diversifies the income composite, reducing the overall earnings volatility and thereby disincentivizing managers to engage in earnings smoothing.
Non-traditional activities decrease banks' accounting quality.	Non-traditional activities lead to greater information asymmetry between bank managers and external stakeholders, incentivizing bank managers to manipulate earnings.
	Non-interest increases the overall bank risk, thereby incentivizing managers to managers to engage in earnings smoothing.

Appendix B summarizes the economic mechanisms and their differential predictions on the relation between non-traditional banking activities and bank financial reporting quality.

Table 1
Descriptive Statistics

	N	Mean	Median	Q1	Q3	Std. Dev.
Dependent Variables						
LLP_{it}	148,778	0.003	0.001	0.000	0.002	0.346
$DLLP\_A_{it}$	148,778	0.000	-0.001	-0.001	0.000	0.003
$DLLP\_B_{it}$	148,778	0.000	0.000	-0.001	0.000	0.003
$ABSDLLP\_A_{it}$	148,778	0.002	0.001	0.000	0.002	0.002
$ABSDLLP\_B_{it}$	148,778	0.002	0.001	0.000	0.002	0.002
Independent Variables						
NII_{it}	148,778	0.110	0.092	0.059	0.138	0.090
$PRED\_NII_{it}$	148,778	0.110	0.109	0.090	0.128	0.031
$SIZE_{it}$	148,778	11.590	11.455	10.712	12.290	1.279
$LOAN_{it}$	148,778	0.610	0.628	0.519	0.720	0.152
$CAPR_{it}$	148,778	0.104	0.096	0.082	0.116	0.033
ROA_{it}	148,778	0.002	0.003	0.001	0.004	0.003
NPL_{it}	148,778	0.013	0.007	0.002	0.016	0.017
ASG_{it}	148,778	0.084	0.056	0.009	0.117	0.153
$PUBLIC_{it}$	148,778	0.025	0.000	0.000	0.000	0.155
CL_{it}	148,778	0.151	0.130	0.078	0.198	0.110
RL_{it}	148,778	0.620	0.643	0.484	0.776	0.210
IL_{it}	148,778	0.119	0.087	0.040	0.158	0.122
AL_{it}	148,778	0.092	0.017	0.000	0.125	0.145
DL_{it}	148,778	0.001	0.000	0.000	0.000	0.016
Commercial Bank Dummy	148,778	0.938	1.000	1.000	1.000	0.242
Non-Deposit Trust Company Dummy	148,778	0.000	0.000	0.000	0.000	0.004
Savings Bank Dummy	148,778	0.048	0.000	0.000	0.000	0.213
Savings and Loan Association Dummy	148,778	0.000	0.000	0.000	0.000	0.004
Cooperative Bank Dummy	148,778	0.009	0.000	0.000	0.000	0.094
Industrial Bank Dummy	148,778	0.006	0.000	0.000	0.000	0.076

Table 1 provides the descriptive statistics for all variables used in the analysis. Continuous variables are winsorized at top and bottom 1%. Definitions of the variables are provided in Appendix A.

Table 2
Pearson Correlation Matrix

		3	4	5	6	7	8	9	10
1	$ABSDLLP\_A_{it}$	0.055***	0.043***	0.026***	0.047***	-0.464***	0.351***	0.054***	-0.009***
2	$ABSDLLP\_B_{it}$	0.050***	0.031***	0.007***	0.058***	-0.464***	0.359***	0.050***	-0.010***
3	NII_{it}	1.000	0.229***	-0.045***	-0.015***	0.168***	0.009***	0.036***	0.067***
4	$SIZE_{it}$		1.000	0.219***	-0.149***	0.089***	0.059***	0.167***	0.251***
5	$LOAN_{it}$			1.000	-0.239***	0.009***	0.023***	0.121***	0.063***
6	$CAPR_{it}$				1.000	0.036***	0.007***	-0.128***	-0.043***
7	ROA_{it}					1.000	-0.354***	0.167***	0.000
8	NPL_{it}						1.000	-0.152***	0.004
9	ASG_{it}							1.000	0.044***
10	$PUBLIC_{it}$								1.000

Table 2 provides the Pearson correlation for variables used in the regressions. Continuous variables are winsorized at top and bottom 1%. *, **, *** denote significance at the 10%, 5%, and 1% levels, respectively, based on a two-tailed test. Definitions of the variables are provided in Appendix A.

Table 3
Estimation of Discretionary Loan Loss Provisions

Panel A: Estimation of *DLLP* Using Equation (1a)

	Dependent Variable = LLP_{it} (1)	
Variable	Coefficient	*t*-Statistic
Intercept	0.000	1.67*
ΔNPL_{it+1}	0.004	3.26***
ΔNPL_{it}	0.049	36.54***
ΔNPL_{it-1}	0.044	38.75***
ΔNPL_{it-2}	0.031	33.25***
$SIZE_{it-1}$	0.0001	4.21***
$\Delta LOAN_{it}$	0.002	21.48***
ΔST_GDP_{it}	-0.003	-6.06***
ΔST_HPI_{it}	-0.002	-18.93***
ΔST_UR_{it}	0.010	4.07***
State Fixed Effects	Yes	
Year Fixed Effects	Yes	
N	148,803	
Adj. R^2	0.171	

Panel B: Estimation of *DLLP* Using Equation (1b)

	Dependent Variable = LLP_{it} (1)	
Variable	Coefficient	*t*-Statistic
Intercept	-0.001	-2.28**
ΔNPL_{it+1}	0.008	6.74***
ΔNPL_{it}	0.054	38.43***
ΔNPL_{it-1}	0.046	40.14***
ΔNPL_{it-2}	0.031	33.75***
$SIZE_{it-1}$	0.0001	5.04***
$\Delta LOAN_{it}$	0.002	23.10***
ΔST_GDP_{it}	0.049	17.16***
ΔST_HPI_{it}	-0.003	-5.31***
ΔST_UR_{it}	-0.002	-17.92***
LLA_{it-1}	0.009	3.74***
State Fixed Effects	Yes	
Year Fixed Effects	Yes	
N	148,778	
Adj. R^2	0.185	

Table 3 provides the OLS regression results of estimating *DLLP*, with Panel A using Equation (1a) and Panel B using Equation (1b), respectively. Continuous variables are winsorized at top and bottom 1%. *, **, *** denote significance at the 10%, 5%, and 1% levels, respectively, based on a two-tailed test. Standard errors are clustered at the bank level. Definitions of the variables are provided in Appendix A.

Table 4
Non-Traditional Banking Activities and Bank Earnings Quality

	Dependent Variable = $ABSDLLP\_A_{it}$ (1)		Dependent Variable = $ABSDLLP\_B_{it}$ (2)	
Variable	Coefficient	*t*-Statistic	Coefficient	*t*-Statistic
Intercept	-0.001	-5.40***	-0.001	-4.42***
NII_{it}	0.003	16.87***	0.003	17.04***
$SIZE_{it}$	0.0001	6.64***	0.0001	5.49***
$LOAN_{it}$	0.001	6.62***	0.0002	3.20***
$CAPR_{it}$	0.007	15.34***	0.008	17.07***
ROA_{it}	-0.316	-50.90***	-0.308	-50.91***
NPL_{it}	0.028	38.44***	0.030	41.96***
ASG_{it}	0.002	38.73***	0.002	39.39***
$PUBLIC_{it}$	-0.0005	-8.61***	-0.0004	-8.17***
Year Fixed Effects	Yes		Yes	
N	148,778		148,778	
Adj. R^2	0.317		0.319	

Table 4 provides the OLS regression results of the magnitude of *DLLP* on *NII* using Equations (2a) and (2b). Continuous variables are winsorized at top and bottom 1%. *, **, *** denote significance at the 10%, 5%, and 1% levels, respectively, based on a two-tailed test. Standard errors are clustered at the bank level. Definitions of the variables are provided in Appendix A.

Table 5
Instrumental Variable Analysis of Non-Traditional Banking Activities and bank Earnings Quality

Panel A: First-Stage Regression to Predict *NII*

	Dependent Variable = NII_{it} (1)	
Variable	Coefficient	*t*-Statistic
Intercept	0.014	0.74
$SIZE_{it}$	0.015	19.68***
$LOAN_{it}$	-0.059	-10.52***
$CAPR_{it}$	-0.047	-1.71*
ROA_{it}	4.789	22.97***
NPL_{it}	0.174	4.33***
ASG_{it}	-0.006	-2.21**
$PUBLIC_{it}$	0.009	1.66*
Commercial Bank Dummy	-0.023	-1.42
Non-Deposit Trust Company Dummy	0.534	32.31***
Savings Bank Dummy	-0.063	-3.91***
Savings and Loan Association Dummy	-0.060	-1.79
Cooperative Bank Dummy	-0.056	-3.41***
Year Fixed Effects	Yes	
N	148,778	
Adj. R^2	0.118	

Panel B: Second-Stage Regression Results for *DLLP*

	Dependent Variable = $ABSDLLP\_A_{it}$ (1)		Dependent Variable = $ABSDLLP\_B_{it}$ (2)	
Variable	Coefficient	*t*-Statistic	Coefficient	*t*-Statistic
Intercept	-0.001	-5.66***	-0.001	-4.82***
$PREDNII_{it}$	0.021	16.03***	0.022	15.57***
$SIZE_{it}$	-0.0002	-9.58***	-0.0002	-10.32***
$LOAN_{it}$	0.002	12.89***	0.001	11.13***
$CAPR_{it}$	0.008	16.09***	0.009	17.97***
ROA_{it}	-0.406	-44.35***	-0.402	-42.78***
NPL_{it}	0.025	31.54***	0.026	33.88***
ASG_{it}	0.002	38.91***	0.002	39.68***
$PUBLIC_{it}$	-0.001	-11.86***	-0.001	-11.77***
Year Fixed Effects	Yes		Yes	
N	148,778		148,778	
Adj. R^2	0.311		0.314	

Table 5 provides the regression results for the instrumental variable analysis. Panel A provides the first-stage regression that predicts *NII* using Equation (3). Panel B provides the second-stage regression that tests the impact of the predicted *NII* on the magnitude of *DLLP* using Equations (4a) and (4b), respectively. Continuous variables are winsorized at top and bottom 1%. *, **, *** denote significance at the 10%, 5%, and 1% levels, respectively, based on a two-tailed test. Standard errors are clustered at the bank level. Definitions of the variables are provided in Appendix A.

Table 6
Non-Traditional Banking Activities and Bank Earnings Quality by Listing Status

Panel A: Regression in Public Banks

	Dependent Variable = $ABSDLLP\_A_{it}$ (1)		Dependent Variable = $ABSDLLP\_B_{it}$ (2)	
Variable	Coefficient	*t*-Statistic	Coefficient	*t*-Statistic
Intercept	-0.001	-1.27	-0.001	-1.38
NII_{it}	0.001	1.75*	0.001	1.71*
$SIZE_{it}$	0.0001	2.32**	0.000	2.42**
$LOAN_{it}$	0.0004	1.19	0.000	0.98
$CAPR_{it}$	0.005	2.48**	0.005	2.67***
ROA_{it}	-0.293	-8.63***	-0.281	-8.43***
NPL_{it}	0.033	6.73***	0.034	6.83***
ASG_{it}	0.002	8.12***	0.002	8.16***
Year Fixed Effects	Yes		Yes	
N	3,670		3,670	
Adj. R^2	0.402		0.396	

Panel B: Regression in Private Banks

	Dependent Variable = $ABSDLLP\_A_{it}$ (1)		Dependent Variable = $ABSDLLP\_B_{it}$ (2)	
Variable	Coefficient	*t*-Statistic	Coefficient	*t*-Statistic
Intercept	-0.001	-5.41***	-0.001	-4.42***
NII_{it}	0.003	16.88***	0.003	17.05***
$SIZE_{it}$	0.0001	6.53***	0.0001	5.36***
$LOAN_{it}$	0.001	6.53***	0.0003	3.12***
$CAPR_{it}$	0.007	15.23***	0.008	16.93***
ROA_{it}	-0.317	-50.18***	-0.308	-50.23***
NPL_{it}	0.028	37.94***	0.030	41.47***
ASG_{it}	0.002	37.74***	0.002	38.41***
Year Fixed Effects	Yes		Yes	
N	145,108		145,108	
Adj. R^2	0.316		0.317	

Table 6 provides the OLS regression that tests the effect of *NII* on the magnitude of *DLLP* using Equations (2a) and (2b), with Panel A for public banks and Panel B for private banks, respectively. Continuous variables are winsorized at top and bottom 1%. *, **, *** denote significance at the 10%, 5%, and 1% levels, respectively, based on a two-tailed test. Standard errors are clustered at the bank level. Definitions of the variables are provided in Appendix A.

Table 7
Investment Banking Fee-Based Activities, Trading Activities, the Gramm-Leach-Bliley Act of 1999, and Bank Earnings Quality

Panel A: Investment Banking Fee-Based Activities, Trading Activities, and Bank Earnings Quality

	Dependent Variable = $ABSDLLP\_A_{it}$ (1)		Dependent Variable = $ABSDLLP\_B_{it}$ (2)	
Variable	Coefficient	*t*-Statistic	Coefficient	*t*-Statistic
Intercept	-0.001	-5.07***	-0.001	-4.46***
FEE_{it}	0.003	10.59***	0.003	10.47***
$TRAD_{it}$	-0.0002	-0.03	0.004	0.70
$SIZE_{it}$	0.0001	6.57***	0.0001	5.86***
$LOAN_{it}$	0.001	6.77***	0.0004	4.42***
$CAPR_{it}$	0.008	13.25***	0.008	14.44***
ROA_{it}	-0.306	-39.73***	-0.299	-39.99***
NPL_{it}	0.026	29.16***	0.028	32.06***
ASG_{it}	0.002	34.60***	0.002	35.61***
$PUBLIC_{it}$	-0.0005	-8.88***	-0.004	-8.55***
Year Fixed Effects	Yes		Yes	
N	100,126		100,126	
Adj. R^2	0.338		0.342	

Panel A of Table 7 provides the OLS regression that tests the impact of *FEE* and *TRAD* on the magnitude of *DLLP* using Equations (5a) and (5b). Continuous variables are winsorized at top and bottom 1%. *, **, *** denote significance at the 10%, 5%, and 1% levels, respectively, based on a two-tailed test. Standard errors are clustered at the bank level. Definitions of the variables are provided in Appendix A.

Table 7 (Continued)

Panel B: The Gramm-Leach-Bliley Act of 1999, Fee-Based Activities, and Bank Earnings Quality

	Dependent Variable = $ABSDLLP\_A_{it}$ (1)		Dependent Variable = $ABSDLLP\_B_{it}$ (2)	
Variable	Coefficient	*t*-Statistic	Coefficient	*t*-Statistic
Intercept	-0.002	-6.27***	-0.002	-5.85***
FEE_{it}	0.001	0.76	0.001	1.32
$FEE_{it} * POST_{it}$	0.003	3.20***	0.002	2.59***
$TRAD_{it}$	-0.001	-0.11	0.003	0.56
$TRAD_{it} * POST_{it}$	-0.012	-0.56	-0.008	-0.40
$SIZE_{it}$	0.000	6.47***	0.000	6.29***
$LOAN_{it}$	0.001	6.19***	0.001	4.46***
$CAPR_{it}$	0.008	10.15***	0.008	11.04***
ROA_{it}	-0.212	-16.02***	-0.206	-16.39***
NPL_{it}	0.045	23.98***	0.046	25.98***
ASG_{it}	0.002	23.41***	0.002	24.43***
$PUBLIC_{it}$	0.000	-7.12***	0.000	-6.91***
Year Fixed Effects	Yes		Yes	
N	39,163		39,163	
Adj. R^2	0.188		0.193	

Panel B of Table 7 provides the OLS regression that tests the impact of *FEE* and *FEE*POST* on the magnitude of *DLLP* using Equations (6a) and (6b). Continuous variables are winsorized at top and bottom 1%. *, **, *** denote significance at the 10%, 5%, and 1% levels, respectively, based on a two-tailed test. Standard errors are clustered at the bank level. Definitions of the variables are provided in Appendix A.

Table 8
The Difference-in-Difference Estimation of the Impact of Gramm-Leach-Bliley Act of 1999 on Bank Earnings Quality

	Dependent Variable = $ABSDLLP\_A_{it}$ (1)		Dependent Variable = $ABSDLLP\_B_{it}$ (2)	
Variable	Coefficient	*t*-Statistic	Coefficient	*t*-Statistic
Intercept	-0.001	-0.81	-0.0002	-0.28
$Treated_i * POST_t$	0.0002	3.96***	0.0002	3.79***
$SIZE_{it}$	0.0001	2.28**	0.0001	1.86*
$LOAN_{it}$	0.002	9.37***	0.001	8.15***
$CAPR_{it}$	-0.0002	-0.23	0.0001	0.16
ROA_{it}	-0.355	-31.19***	-0.344	-30.79***
NPL_{it}	0.023	17.10***	0.024	24.26***
ASG_{it}	0.002	23.73***	-0.002	-0.28
Year Fixed Effects	Yes		Yes	
Bank Fixed Effects	Yes		Yes	
N	57,199		57,199	
Adj. R^2	0.47		0.46	

Table 8 provides the difference-in-difference estimation of the impact of Gramm-Leach-Bliley Act of 1999 on Bank Earnings Quality. In order to achieve a balanced sample in both pre- and post- GLBA, we cover the sample data from 1993 to 2010. Continuous variables are winsorized at top and bottom 1%. *, **, *** denote significance at the 10%, 5%, and 1% levels, respectively, based on a two-tailed test. Standard errors are clustered at the bank level. Definitions of the variables are provided in Appendix A.