**The Accounting Implication of Banking Deregulation:**

**An Event Study of Gramm-Leach-Bliley Act (1999)**

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**Abstract**

Bank regulation has undergone almost a complete circle from the Glass-Steagall Act (1933), through a period of deregulation since 1980s, culminating in the repeal of GSA by the Gramm-Leach-Bliley Act (GLBA, 1999), to the Dodd-Frank Wall Street Reform and Consumer Protection Act (2010), which attempted to restore some of the rules under SGA. The GLBA allowed the largest U.S. bank holding companies to expand into more market-sensitive business activities, which contributed to a significant increase in both their systematic and accounting risks. Despite increasing reporting requirements, bank accounting information decreased in value relevance in terms of both earnings quality and Statistical Cost Relationship during the post-GLBA period. The increase in the uncertainty of bank accounting information weakened market efficiency and had a negative impact on the effectiveness of regulatory supervision. Lessons learned from the repeal of SGA are timely and relevant to the implementation of the financial institution data aggregation and integration requirements under DFA.

**I. Introduction**

Banking is a regulated industry, and bank accounting reflects the requirements of different regulatory regimes. Banking crises are less likely in countries with greater regulated disclosure and transparency. U. S. banks follow both the Generally Accepted Accounting Standards (GAAP) and a set of regulatory requirements for financial reporting. Despite the fact that the Financial Accounting Standard Board (FASB) has issued an increasing number of bank-related accounting standards in response to the deregulation of the financial markets, empirical data show that accounting standards alone are insufficient to guarantee transparent disclosure of the risks associated with bank operations. The recent financial crisis is a loud and clear call for a fundamental overhaul of the nation’s financial regulatory system. Revamping the patchwork U. S. financial rule book requires an understanding of the accounting implications of banking regulation. This paper examines the monitoring role of accounting information in relation to the repeal of the Glass-Steagall Act (GSA) by the Gramm-Leach-Bliley Act (GLBA) in 1999.

The passage of GSA (1933), in reaction to the collapse of a large portion of the American commercial banking system during the Great Depression, strictly separated investment and commercial banks in terms of their business activities to avoid bank runs resulting from speculative failure. Under GSA, investment and commercial banks fell under the supervision of different regulatory agencies, and followed dissimilar financial reporting requirements. President Reagan presided over a period of anti-regulation in the 1980s, which loosened rules governing banks and thrifts. Congress started to relax the restrictions of GSA. A major game changer came during the Clinton era when GSA was replaced with GLBA in 1999, completely removing the barriers between commercial and investment banks and allowing commercial banks to participate in securities and insurance business. The repeal of GSA enabled banks to underwrite and trade financial instruments such as mortgage-backed securities and collateralized debt obligations and establish structured investment vehicles (SIVs) that traded these securities. Under GLBA, the Securities and Exchange Commission (SEC) became responsible for regulating the broker-dealer subsidiaries of investment banks, but no federal regulatory agency has been granted explicit authority and responsibility for the supervision of investment bank holding companies with bank affiliates. There was no provision in the law requiring investment bank holding companies to compute capital measures and maintain liquidity on a consolidated basis as commercial banks. In 2000, the Commodity Futures Modernization Act further reduced the government’s oversight of complex securities, paving the way for financial innovations to take off.

The repeal of GSA was the de jure climax in the deregulation of financial markets, making it possible for financial industry to emerge as a dominant force and come to eclipse the real economy rather than serve its traditional role as a supplier of capital to goods and services. Financial innovation has evolved into vastly complex derivative deals with risks often too opaque to assess and control. Policymakers ignored the key difference between financial and other markets, unaware of the former being always more imperfect than the latter, more prone to manias and panics, and susceptible to the pitfalls of imperfect information unequally shared by investors. As a result, bank accounting underwent a period of trials and errors during the whirlwind of deregulation.

In the wake of the financial crisis of 2007, proposals to reenact the GSA and re-impose the separation of commercial and investment banking, generally known as the “Volcker Rule”, have been introduced in both the Senate and Congress. A diluted version of the “Volcker Rule” became part of the Dodd-Frank Wall Street Reform and Consumer Protection Act (DFA) in 2010. The new law limits proprietary trading and private equity activities by banks that are otherwise backed by taxpayer-funded guarantees. An economic review of these activities, with all of their associated costs, is required to determine whether they should belong to separate entities. In Continental Europe, notably in France, Germany and Italy, an increasing number of advocates are also calling for the adoption of stricter bank regulation through new national and EU-wide legislations based on the GSA.

This study empirically tests the impact of the repeal of GSA on the largest U. S. bank holding companies by comparing both their market and accounting risks between the pre- and post-repeal periods. The regression results show a significant decrease in the value relevance of bank earnings following the replacement of GSA by GLBA. Statistical analysis indicates a positive association between the change in banks’ market and accounting uncertainties and the growing weight of nontraditional business mix in banks’ product portfolios, which are more market-sensitive than traditional bank transactions. Banks are found to use higher leverage, liquidity mismatch and short-term funding to boost their noninterest income. This risk-taking strategy drove up banks’ profitability in the deregulated financial markets until the subprime mortgage debacle erupted in 2007. The information asymmetry caused by the widening gap between increased bank risk exposure and decreased value relevance of accounting information has contributed significantly to the regulatory failure leading to the financial market meltdown. Lessons learned from the accounting implications of the repeal of GSA are timely and relevant to the implementation of DFA.

The organization of the study is as follows. The next section provides a background on bank deregulation and accounting development. Section three develops the hypotheses and models. Section four describes the data set and reports test results. Concluding remarks are offered in section five.

1. **Banking Deregulation and Accounting Standards**

Despite their wide variations across nations and jurisdictions, banking regulations have several essential principles in common, including minimum capital ratio, reserve requirement, supervisory review, market disciplines, corporate governance, and financial reporting and disclosure requirements. The separation between commercial and investment banks as mandated by GSA aimed to avoid the conflicts of interest characterized by the granting of credit (lending) and the use of credit (investing) by the same entity, to ensure soundness and competition in the market for funds by limiting the financial power of depository institutions, to avoid security activities which could be risky to banks, and to prevent management from moral hazard in speculative securities businesses.

Commercial banks started to pursue a product diversification strategy subsequent to the deregulation of financial markets. The argument for such a shift was that in a deregulated market where distinctions between loans, securities, and deposits were not well drawn, banks would lose market share to securities firms that were not so strictly regulated if not allowed to expand into non-banking activities. It was suggested that conflicts of interest ensuing from such expansion could be prevented by separating the lending and credit functions through forming distinctly separate subsidiaries of financial firms. The securities activities that depository institutions were seeking were believed to be both low-risk by their very nature and would also reduce the total risk of organizations offering them by diversification. It is believed that the repeal of GSA would allow individuals, who put more money into investments when the economy is doing well, but most of their money into savings accounts when the economy turns bad, thus to do both “savings” and “investing” at the same institution and fare well in both good and bad times (See, for example, Demsetz and Strahan 1997, Akhavein, Berger and Humphrey 1997, Berger and DeYoung 2001). Many of the largest banks, brokerages and insurance companies desired the repeal of the GSA.

The passage of the Depository Institutions Deregulation and Monetary Control Act (1980), the Garn-St Germain Depository Institutions Act (1982), and the Riegle-Neal Interstate Banking and Branching Efficiency Act (1994) had gradually relaxed the restrictions of GSA and paved the way for its final replacement by GLBA in 1999. GLBA opened up competition among banks, securities companies and insurance companies, and allowed commercial and investment banks to consolidate, thus creating the term “financial institutions” defined as “companies that offer financial products or services to individuals, like loans, financial or investment advice, or insurance”. As a result much consolidation occurred in the financial service industry since. A well-known example is Citibank’s merger with Travelers Group in forming the conglomerate Citigroup, considered as the largest and most profitable company in the world at that time. Few would imagine at the inception of Citigroup that the fall of 2007 was to see it on the verge of bankruptcy, requiring a series of unprecedented government rescue packages for survival. GLBA also explicitly exempted security-based swap agreements from regulation by the SEC by amending the Securities Act of 1933. Many believe that GLBA is directly accountable for causing the 2007 subprime mortgage fiasco.

The rapid growth of the financial service industry and innovative financial instruments posed a serious challenge to the accounting profession. The Financial Accounting Standard Board (FASB) has issued an increasing number of standards in relation to financial institutions and transactions since the 1980s, including Statement No. 65 “Accounting for Certain Mortgage Banking Activities” (1982), Statement No. 72 “Accounting for Certain Acquisitions of Banking or Thrift Institutions” (1983), Statement No. 80 “Accounting for Futures Contract” (1984), Statement No. 104 “Statement of Cash Flows-Exemption of Certain Cash Receipts and Payments and Classification of Cash Flows from Hedging Transactions” (1989), Statement No. 105 “Disclosure of Information about Financial Instruments with Off-Balance-Sheet Risk and Financial Instruments with Concentrations of Credit Risk” (1989), Statement No. 107 “Disclosure about Fair Value of Financial Instruments” (1991), Statement No. 114 “Accounting by Creditors for Impairment of a Loan” (1993), Statement No. 115 “Accounting for Certain Investments in Debt and Equity Securities” (1993), Statement No. 118 “Accounting by Creditors for Impairment of a Loan-Income Recognition and Disclosure” (1994), Statement No. 119 “Disclosure about Derivative Financial Instruments and Fair Value of Financial Instruments” (1994), Statement No. 122 “Accounting for Mortgage Servicing Rights “ (1995), Statement No. 125 “Accounting for Transfer and Servicing of Financial Assets and Extinguishment of Liabilities” (1996), Statement No. 133 ‘Accounting for Derivative Instruments and Hedging Activities” (1998), Statement No. 134 “Accounting for Mortgage-Backed Securities Retained after the Securitization of Mortgage Loans Held for Sale by a Mortgage Banking Enterprise” (1998), Statement No. 147 “Acquisition of Certain Financial Institutions” (2002), Statement No. 150 “Accounting for Certain Financial Instruments with Characteristics of Both Liability and Equity” (2003), Statement No. 157 “Fair Value Measurements” (2006), and Statement No. 161 “Disclosures about Derivative Instruments and Hedging Activities”.

The evolvement in the deregulated financial markets make it necessary for FASB to continuously update its standards for currency after their issuance. For instance, the three disclosure standards, namely, Statement No. 105 (1990), Statement No. 107 (1991), and Statement No. 119 (1994) were issued as interim disclosure measures pending Statement No. 133 (1989), which was successively superseded by Statement No. 137 (1999), Statement No. 138 (2000), Statement No. 149 (2003), Statement No. 155 (2006), and Statement No. 161 (2008). Likewise, Statement No. 114 was superseded by Statement No. 118 (1994), Statement No. 115 (1993) by Statement No. 159 (2007), and Statement No. 125 by Statement No. 127 (1996), Statement No. 140 (2000), Statement No. 156 (2006), and Statement No. 166 (2009) in succession.

The fundamental principle underlying these standards is to enhance the quality of information available about financial institutions’ risk profiles, risk management practice and related gains and losses. This objective is addressed through enhancement to both the accounting and disclosure requirements where necessary to increase market confidence. In order to achieve this objective, the standards aim to present banking transactions in a robust and consistent manner in line with economic substance. A strong overlay is desired to reflect the entity’s underlying business model consistent with the entity’s documented risk management strategy and its practice, while considering the characteristics of the instruments involved. In sum, these standards demonstrate FASB’s transition from a historical cost to a mark-to-market approach in accounting for investments in marketable securities. In accordance with mark-to-market, financial institutions need to prepare their balance sheet on a daily basis to reflect the fluctuations in the fair value of their financial assets. Banks and other financial institutions oppose using mark-to-market for marketable securities because it would introduce volatility into their financial statements. FASB has tried to implement mark-to-market on a piecemeal approach by starting with financial assets, and extending to options and derivatives. The role of regulatory disclosure to banking system stability is controversial. While the “transparency-stability” view holds that greater disclosure fosters banking system stability through reducing informational asymmetries, the “transparency-fragility” view emphasizes the negative externalities that may be associated with greater disclosure and its potential to damage market confidence in banking system stability (Tadesse, 2006).

Nelson (1996) evaluates the association between the market value of banks’ common equity and fair value estimates disclosed under FASB Statement No. 107, and her findings suggest that only the reported fair value of investment securities have incremental explanatory power relative to book value. Eccher et al. (1996) examine the value relevance of fair value data disclosed under the same statement, and find that differences between fair and book values of financial instruments are associated with market-to-book ratios. Hirst et al. (2004) assess how fair-value-income measurement affects commercial bank equity analysts’ risk and value judgments, and provide evidence that differences in income measurement affect fundamental judgments of specialist analysts. Hodder et al. (2006) investigate the risk relevance of the standard deviation of three performance measures, and report that the volatility of full-fair-value income is more than three times that of comprehensive income and more than five times that of net income, suggesting that full-fair-value income volatility reflects elements of risk that are not captured by volatility in net income of comprehensive income, and relates more closely to capital market pricing of that risk than either net-income volatility or comprehensive-income volatility. On the contrary, Khurana and Kim (2003) were unable to detect a discernible difference in the informativeness of fair value measures under FASB Statements No. 107 and 115 collectively relative to historical cost measures for their sample over the 1995-98 period. Benston and Wall (2005) find that fair value is not verifiable for many loans because of adverse selection risk.

Fair value is an appropriate measurement for trading activities, stand-alone derivatives, and potentially other instruments managed on a fair value basis. However, in hindsight of the financial crisis, it is recognized that fair value is not effective when markets become dislocated or are illiquid. Controversy has also risen concerning how to estimate the fair value of assets and liabilities using different conventions. Some argue that fair value should not be required for items, especially liabilities, which are managed on an amortized cost basis in accordance with the firms’ business model (Barth et al., 2008). For financial instruments that are either not actively traded, or have insufficient market depth, or rely on valuation models using unobservable inputs, there is considerable valuation uncertainty. Valuation adjustment should be made to avoid misstatement of both initial and subsequent profit or loss recognition, when there is significant valuation uncertainty (Basel Committee 2004). International Accounting Standard Board (IASB) has incorporated these considerations into International Accounting Standard (IAS) 39, “Disclosure in the Financial Statements of Banks and Similar Financial Institutions” (2003) and International Financial Reporting Standard 9, “Financial Instrument” (IASB, 2010).

1. **Hypotheses and Models**

Bank financial reporting is valuable to users if it enables them to assess amounts, timing and uncertainty of future cash flows of the reporting entity and stewardship and accountability of the entity’s management. The quality of bank accounting information relies on its reliability and relevance in analyzing the risk profiles of the reporting entity, its risk management practice and related gains or losses. The basic role of banks can be modeled as a financial intermediary specialized in transforming deposits into loans and investments, thus exposing banks to two major sources of risk, namely, credit risk and market risk. Credit risk is the risk that loans will not be repaid, and market risk is the risk of losses arising from investments because of adverse movements in market prices. While banks’ traditional business are more associated with credit risk, market risk is inherent in the financial instruments associated with nontraditional banking operations/activities, including securities, trading assets and liabilities, as well as derivatives. These trading positions are reported at estimated market value with changes reflected in income. In particular, trading positions are exposed to various market risk factors, such as interest rates and foreign exchange rates as well as other macroeconomic elements, which affect unanimously across the mortgage, equity and commodity markets. Banks seek to mitigate trading risk using hedging techniques. Some of these market-sensitive assets and liabilities are generated through loan and deposits associated with traditional banking activities. Banks’ engagement in an increasing array of nontraditional activities would also influence their traditional operations. The traditional bank loans and deposit products are mostly in nontrading positions, which are reported at amortized cost under current accounting rules. However, these positions are not immune to changes in economic value based on varying market conditions.

The primary caveat of GSA was to limit banks’ exposure to market risk by restricting their operating scope. Consequently, the repeal of GSA would lead to an increase in the systematic risk of the banking industry by allowing banks to be engaged in more risk-taking business activities. Under GLBA, banks’ exposure to market risk has not only increased through the expansion of their trading positions, but also has an impact on their nontrading positions, which have become more market-risk sensitive through their association with trading positions. The increased operating risks will inevitably result in a higher systematic risk for banks. Therefore, the first hypothesis is stated as follows:

H1: The repeal of GSA has significantly increased the systematic risk of banks.

The capital asset pricing model (CAPM) defines required rate of return of a security as a function of the systematic risk (beta) in relation to the market return. To test the first hypothesis, we add a period dummy in the CAPM model to capture the change in banks’ beta before and after the repeal of GSA:

*Rit* = *α* + *b1iRmt* + *b2Di* + *b3i Di\*Rmt* + *ei*  (1)

where *Rit* is the return of bank *i* on day *t,*

*b1i* is the beta of bank *i,*

*Rmt* is the market return on day *t,*

*Di* is a dummy variable assigned a value of “0” (“1”) for the pre (post)-repeal period,

*Di\*Rmt* denotes the interaction between the period dummy and the beta of bank *i*,

e*i* is a disturbance term.

A significant positive *b3* indicates that the systematic risk of the banking industry has increased subsequent to the repeal of GSA according to our analysis. In contrast, a significant negative *b3* suggests that the product diversification strategy has reduced the market risk of banks in the post-period.

The institutional design of banking supervision has been emphasized to eliminate moral hazard bias and strengthen market discipline in the banking industry. In the context of market deregulation based on enlarged market discipline in the banking system, an important issue relates to the extent and quality of bank accounting information, which is essential in the working of the market mechanism because market participants base their economic decisions on the information. With the introduction of more sophisticated risk-related trading activities following the repeal of GSA, how to provide reliable and relevant bank accounting information, which significantly impacts the effectiveness of the market discipline and regulatory supervision, becomes a challenge. We test the impact of the repeal of GSA on the quality of bank accounting information in the next two hypotheses.

The second hypothesis tests the effect of the repeal of GSA on bank earnings quality. We expect an increase in accounting risk resulting from higher bank operating risk. Bank earnings has five main components. Interest income is the result of all interest and dividend earned on interest-bearing assets (such as loans and leases). Interest expense is the result of all interest paid to depositors and other creditors. Non-interest income used to include mainly service fees on deposit accounts, credit cards and others, and gains/losses on sales of government securities, which form traditional banking transactions under GSA. Income from nontraditional banking business, such as trading accounts, investment banking, insurance underwriting and securitization of loans, is also classified as non-interest income. Non-interest or operating expense includes personnel compensation, legal expenses, office occupancy and equipment expenses. Finally provisions for loan losses is the amount charged as operating expenses to provide an adequate reserve to cover anticipated losses in the loan portfolio. These charges become part of the allowance for loan losses, a deductive component from the asset on bank balance sheet, which is then used to charge off loans after they become non-performing. We expect that non-interest income would account for an increasingly greater part of bank earnings after the repeal of GSA removed the barrier between commercial and investment banking, and allowed banks to expand into a growing number of non-traditional business activities. The risk-related activities increasingly pursued by banks after the repeal of SGA are accountable for the increase of uncertainty in aggregate bank earnings. The second hypothesis is stated as:

H2: The repeal of GSA has a significant effect on the association of bank price with earnings, and in particular, the non-interest earnings components.

First, we use the Earnings Response Coefficient (ERC) model to examine the association between bank price and aggregate earnings:

*MVit* = *α* + *b1Eit* + *b2Di* + *b3Di\*Eit* + *ei*  (2)

where *MVit* is market value of bank *i* at the end of period *t,*

*Eit* is the earnings of bank *i* for period *t,*

*Di\*Eit* denotes the interaction between the period dummy and earnings of bank *i* for period *t.*

The other variables are as previously defined. The interaction term between the period dummy and bank earnings captures the impact of the repeal of GSA on the earnings response coefficient. As bank earnings became more driven by market-sensitive transactions, and bank reporting kept changing from cost to mark to market, we expect a stronger association between market value and aggregate bank earnings after the repeal of GSA, consistent with the findings by Hodder et al. (2006) that full-fair-value income relates more closely to capital market pricing. This stronger association indicates an increase of both value and risk relevance in bank earnings.

Next we use an expanded ERC model to test the association between bank price and earnings components. In the first run, we decompose bank earnings into three broad categories, namely, net interest income (difference between interest revenue and interest expense), net non-interest income (difference between non-interest income and non-interest expense), and provisions for loan losses.

*MVit* = *α* + *b1NIIit* + *b2NONIIit* + *b3PLLit* + *b4Di* + *b5Di\*NIIit* + *b6Di\*NONIIit* + *b7Di\*PLLit + ei* (3)

Where *NIIit* is net interest income of bank *i* for period *t,*

*NONIIit* is net non-interest income of bank *i* for period *t,*

*PLLit*  is provisions for loan losses of bank *i* for period *t.*

*Di* and *ei* are as previously defined. *Di\*NIIit, Di\*NONIIit and DiPLLit* are interaction terms. The decomposition of interest income from noninterest income enables us to differentiate between their separate associations with market price. The interaction term, *Di\*NIIit* (*Di\*NONIIit*)*,* is expected to be positive (negative). This shows that while interest income increases in terms of both value and risk relevance, noninterest income increases more in risk, than value, relevance, because of its greater exposure to market volatility in the post SGA period.

We further decompose net non-interest income, in the second run, into its major components and test their correlations with price, respectively:

*Pit* = *α* + *b1NIIit* + *b2TRit* + *b3GLLit* + *b4GLSi* + *b5PLLit* + *b6Di* + *b7DiNIIit* + *b8TRit* + *b9GLLit* + *b10GLS* + *b11PLLit* + *ei*  (4)

Where *TRit* istrading revenue (net gain of loss from trading cash instruments and off-balance-sheet derivative contracts) of bank *i* for period *t*,

*GLLit* is net gain or loss on loans of bank *i* for period *t*,

*GLSit* is net gain of loss on securities transactions of bank *i* for period *t.*

We expect a significantly negative coefficient for the interaction terms of all the three components of noninterest income, which are collectively accountable for the significantly negative coefficient for the interaction term of noninterest income in Equation (3).

The last hypothesis examines the effect of the repeal of GSA on the Statistical Cost Relationship of bank earnings with major balance sheet items. The Statistical Cost Accounting (SCA) model defines bank earnings as a function of earnings on assets and costs of sources of liabilities/capital (Rose and Wolken, 1986). Banks earnings are determined by the allocation of operating assets, and further affected by the leverage of the capital structure. Bank operating assets involved in traditional business include loans and leases, investments on government debt securities, and the related source of leverage consists of deposits and other short-term borrowing, such as federal funds under repurchase agreement and commercial paper. The repeal of GSA facilitated bank diversification into more risk-related products. Furthermore, in order to achieve greater scale of economy and earnings maximization for competitive advantage, banks often grew in size through mergers and acquisitions. Bank holding companies took advantage of the repeal of GSA to become financial retail supermarkets by providing full services ranging from traditional lending to risky derivative trading. Therefore, we expect significant differences in the SCA function for banks and market valuation of bank assets and liabilities between the two periods, which formulates the third hypothesis:

H3: The repeal of GSA has a significant effect on the association of bank earnings and market valuation with bank assets/liabilities management.

First, we use the SCA model to assess the difference in the association between bank earnings and banks’ operating profiles between the pre- versus post-period:

*Eit* = *α* + *b1GSit* + *b2 (LLit –DPit)* + *b3 (TAit –TLit)* + *b4ISit* + *b5REit* + *b6GWit* +*b7BWit* + *b8Di* + *b9 Di\*GSit* + *b10Di\*(LLit –DPit)* + *b11Di\*(TAit –TLit)* + *b12D\*ISit* + *b13Di\*REit* + *b14Di\*GWit* + *b15 Di\*BWit* + *ei* (5)

where *Eit* is net income of bank *i* for perod *t,*

*GSit* is government securities of bank *i* at the end of period *t*,

(*LLit - DPit )* is loan and lease portfolio minus total deposits for bank *i* at the end of

period *t,*

*(TAit - TLit )* is trading assets minus trading liabilities for bank *i* at the end of period *t,*

*ISit* is investment in subsidiaries by bank *i* at the end of period *t,*

*REit* is investment in real estate by bank *i* at the end of period *t,*

*GWit* is goodwill of bank *i* at the end period t*,*

*BWit* is total borrowings of bank *i* at the end of period *t.*

*Di* and *ei* are as previously defined, and the other independent variables represent major bank balance sheet items and their respective interactions with the period dummy. The coefficients of the interaction terms show the changes in banks’ asset/liability management profile as source of earnings after the repeal of GSA. As banks pursue more aggressive business strategies in the post-GSA period, we expect that banks earnings become more sensitive to risk-related assets, and these assets would require higher financing costs and lead to over-leverage.

We next change the dependent variable from bank earnings to market value and run the regression again (Equation 6). The coefficients of Equation (6) would provide information on the market reaction to the difference in bank operating assets and leverage, as well as the risks embedded in bank operating profiles between the two periods. The results are expected to be different from those in Equation (5), and the difference between the results for Equations (5) and (6) can be interpreted as disassociation between book value and market value resulting from either lack of disclosure transparency or market inefficiency.

1. **Data Set and Test Results**

Our test sample consists of the forty-one largest U.S. bank holding companies with total assets above $10 billion, based on their asset size on December 31, 2009. Bank holding companies were chosen because banks were required to be incorporated into bank holding companies in order to conduct nontraditional business activities. Therefore, the impact of the repeal of GSA would be most obvious on bank holding companies. More importantly, many of these bank holding companies, which are organizations pursuing aggressive banking and investing businesses, are commonly known as “too big to fail” entities, and now they qualify for the new designation of “systematically important” institutions under the DFA. Financial institutions will face differential information and reporting provisions, depending on whether they are classified as “systematically important” (Group A) or not (Group B). Regulators are likely to request from Group A information not currently generated by banks and other significant firms such as nonbanks and insurers. Therefore, the “systemically important” institutions need to adopt more dynamic information provision capabilities and require closer scrutiny. It is of interest to focus on the monitoring role of accounting information regarding this group of “too big to fail” financial institutions under different regulatory regimes.

Financial data of the sample are retrieved from the “Bank Regulatory” section of the WRDs Database. These data were originally filed with the Federal Reserve Bank each quarter via Form FRY-9C, which includes Consolidated Balance Sheet and Income Statement. The test period covers fifteen year from 1992 to 2006 (immediately before the subprime mortgage crisis). The forty-one largest bank holding companies were selected because they have complete data for the whole test period. The fifteen years’ data are split into seven years of pre-repeal period (1992-1998) and seven years of post-repeal period (2000-2006), the year 1999, in which GLBA officially replaced GSA, is excluded as an event window. The data set contains a total of 2,296 firm-quarter observations. The daily market data used for the CAPM model in Equation (1) are collected from CRSP for the same period.

Descriptive statistics are presented in Table 1 (parametric test) and Table 2 (non-parametric test) with identical panels. Both tables report a significant difference for each variable between the pre- and post-period. Panel A reports bank size, which has a significant effect on bank efficiency. Table 1 shows that, on average, bank assets are three times greater in the post- than in the pre-period. Similarly, among the 1,148 pairs of pre- and post-period observations in Table 2, 1,121 pairs show a larger size, which is on average about $585 million more, in the post- as compared to the pre-period. Such a significant increase in bank size sheds light on the tremendous impact of the repeal of GSA on the expansion of bank business scope. The large standard deviation in bank asset further indicates that even among the nation’s largest bank holding companies, there are several mega-banks as compared to their peers.

Panel B compares bank earnings and earnings components between the two periods. Table 1 displays that Net Income (NI) reported in the post-period almost quadruples that reported in the pre-period, demonstrating a very noticeable bank profitability growth. A breakdown of NI into Net Interest Income (NII) and Non-interest Income (NONII) identifies the driving force behind the profitability growth. While NII has about tripled between the two periods (from $321 million to $902 million), NONII appears to be the locomotive for bank profitability growth with an over fourfold increase (from $200 million to $900 million). NONII is only equal to two thirds of NII in the pre-period ($220 million vs. $321 million), but it reaches the same size as NII in the post-period ($900 million vs. $902 million). The increasing weight of NONII in the aggregate NI clearly indicates that bank holding companies have been relying on an expansion of nontraditional businesses as their growth strategy. A decomposition of NONII further exhibits that the growth of Trading Revenues (TR) and Gains/Losses on Loans (GLL) have outpaced the growth of the overall NONII from the pre- to post-period, reflecting banks’ active participation in more market-risk related transactions. The Wilcoxon’s rank test in Panel B of Table 2 likewise demonstrates a significant increase in earnings for the post-period, particularly one-side dominant in NONII.

Panel C lists the changes in the financial position of the sample between the two periods. Given the significant increase in bank size, it is not surprising to find a similar pattern for the individual balance sheet items. However, it is worthy of notice that the increase of some items has outpaced that of others. For instance, Trading Assets (TA), Investment in Subsidiaries (IS) and Investment in Real Estate (RE) have increased by seven, five and nine, times in Table 1, respectively. The increase of these assets, which underlies banks’ deepening involvement in nontraditional business activities, provides the basis for the higher NONII as reported in Panel B. On the contrary, the traditional bank assets, such as Loan and Lease (LL) and Government Securities (GS), only exhibit a lackluster growth rate between the two periods. These traditional bank assets form the basis for interest income, which also underperforms non-interest income between the two periods. The statistics in Panel C are consistent with those in Panel B. The significant increase in Goodwill (GW) in the post-period provides evidence that merger and acquisition played a critical role in the expansion of banks, which used business combination to diversify into new nontraditional business areas. Parallel to the significant increase in nontraditional assets vis-a-vis traditional assets, we observe a significant increase of nontraditional financial leverage, such as Trading Liabilities (TL) and Borrowings (BW), which outpaces the increase of traditional liabilities, such as Deposits (DP). For example, both TL and BW have increased about five times, but DP only increased three times, from the pre- to post-period (Table 1). The Wilcoxon’s rank test reports similar results in Panel C of Table 2.

We use the linear mixed effect (LME) technique to test all the regression models. Classical statistics assumes that observations in cluster data are independently and identically distributed. This assumption may not always hold true and, therefore, lead to false results. In contrast, the LME model treats cluster data more adequately by assuming two sources of variation, within and between panels. Two types of coefficients are distinguished in the LME model: population-averaged, which have the same meaning as in classical statistics; and panel-specific, which are random and are estimated as posteriori means. When the number of clusters is small and the number of observations per cluster is large, the cluster-specific coefficients are treated as fixed and the ordinary regression analysis with dummy variables applies (fixed effect model). Vice versa, when the number of clusters is large but the number of observations per cluster is relatively small, then the cluster-specific coefficients are random (random model). The computer program chooses the fixed model for our tests. Year dummies are included, but not reported, in all the models to control for other environmental changes and events.

The regression results of Equation (1) are reported in Table 3. The coefficient for the period dummy, *Di,* though significant, is close to zero, thus indicating an absence of drastic change in idiosyncratic risk between the two periods. The interaction term *Di\*Rmt* (.220) is highly significant, suggesting that the systematic risk of the banking industry is significantly higher in the post-period. The beta coefficient for the banking industry increased from .593 in the pre- to .813 (.593 + .220) in the post-period. Therefore, it would be reasonable to attribute the increase in the systematic risk of banks to the repeal of GSA, which allowed banks to expand into more market-sensitive business activities. Whether a larger product portfolio would reduce the systematic risk of banks has remained a controversial issue. Our test results demonstrate that product diversification strategy does not reduce bank operating risks. On the contrary, the systematic risk of the banking industry witnessed a significant increase once the separation between commercial and investment banks was removed. Test results strongly support H1.

H2 tests the change in bank earnings quality resulting from the repeal of GSA by focusing on, first, whether there is an increase of uncertainty in aggregate earnings in the post-period (Equation 2); and second, if so, which earnings components are sources of the increased uncertainty (Equations 3 and 4). All variables in the model are deflated by the square root of assets to control for size, as size has a significant effect on bank efficiency. Test results of Equations (2), (3) and (4) are given in Panels A, B, and C of Table 4, respectively. All the four coefficients in Equation (2) are significant. The coefficient of the period dummy (215.9333) appears to have a strong effect on the association of bank price with aggregate earnings. The positive interaction term reflects the market’s upbeat expectation of banks’ profitability growth potential as a result of the repeal of GSA. This result is consistent with the result of H1 that higher systematic risk leads to higher bank return (price) in the post period. The stronger association of bank earnings with price derives from both its increased value and risk relevance. However, the aggregate earnings model is insufficient to distinguish risk relevance from value relevance.

Equations (3) and (4) address the question of which earnings components are most affected by the repeal of GSA. Equation (3) breaks bank earnings into three major components: net interest income (NII), net non-interest income (NONII) and provisions for loan losses (PLL). The coefficients of all the three components have expected signs (positive for both NNI and NONII and negative for PLL) in the pre-period (Panel B of Table 4). The coefficient of NONII decreased from 12.761 to 8.524 (12.761-4.237) following the repeal of GSA. The negative coefficient of the interaction term suggests a significantly negative impact the repeal of SGA has produced on the quality of NONII, which becomes less value (more risk) relevant resulting from the increased complexity of the expanded non-interest business activities. In contrast, the coefficient of NNI increased from 15.097 to 18.375 (15.097 + 3.278) in the post-period, implying that bank valuation relies more on NNI to compensate for the increased uncertainty and complexity of NONII. The test results of Equations (2) and (3) demonstrate that the repeal of GSA has a significantly differential effect on the quality of the interest and noninterest income components of bank earnings, due to the dissimilar degrees of their exposure to market risk. The decomposition model provides information which is lost in the aggregate earnings model.

Equation (4) further breaks NONII into three subcategories: trading revenue (TR), gain/loss on loans (GLL), and gain/loss on securities (GLS). The regression results reported in Panel C of Table 3 show that Equation (4) is an improvement on Equation (3) because each NONII component provides incremental information complementary to total NONII. All the three NONII components have significantly positive coefficient before the repeal of GSA, but significantly negative interaction with the period dummy, suggesting an increase in their uncertainty (decrease in stability) in the post-period. The coefficient for TR becomes from 46.430 in pre- to 19.246 (46.439 – 27.184) in post-period, the coefficient for GLL becomes from 27.396 to -5.490 (27.396 – 32.886), and the coefficient for GLS becomes from 49.830 to 3.999 (49.830 – 45.831).

Interestingly, PLL also shows a significant difference in both Equation (3) and (4) between the two periods, with a negative coefficient of PLL (-36.600 and -24.276 in Equations 3 and 4. respectively) for the pre-period but a positive interaction of PLL with the period dummy (25.957 and 11.331 in Equations 3 and 4, respectively) for the post-period. Using call report data of 1987 and 1988, Niswander and Swanson (2000) report that the discretionary portion of loan loss provisions is influenced by the bank’s level of capital, earnings and taxes. Banks below a capital adequacy threshold often make discretionary choices that reduce earnings and capital. Banks above the threshold exhibit different discretionary outcomes with evidence of income smoothing and tax-advantaged actions. The significantly positive interaction in Equations (3) and (4) implies that increased complexity of banks’ business mix after the repeal of SGA allows banks management more room to use PLL for earnings management purpose. Results of all the three ERC models are consistent with H2 that the repeal of GSA has a significant impact on the accounting information content of bank earnings, especially, the components of banks’ non-interest income. The results of Equation (4) support those of Equation (3), which in turn support those of Equation (2). The removal of the separation between commercial and investment banking activities has enabled banks to expand into more market-sensitive businesses, but the market treats the interest and noninterest income components of bank earnings differently in terms of value and risk relevance between the pre- and post-periods.

H3 tests the bank earnings and market valuation in relation to major bank balance sheet items before and after the repeal of GSA. The regression results of Equation (5) are listed in Panel A of Table 5. A comparison of the traditional versus nontraditional balance sheet items show that while the repeal of GSA has little effect on the former, it has a significant impact on the latter. FASB Statement No. 133 “Accounting for Derivative Instruments and Hedging Activities” (1998) considers derivatives as both assets and liabilities being reported. Its purpose is to increase the visibility, comparability, and understandability of the risks associated with using derivatives by requiring banks to report all derivative assets and liabilities at fair value on the statement of position. We use trading assets minus trading liabilities to represent their net value, which changes from significantly positive (.006) in the prior to significantly negative (.006 -.011) in the post, period. It is the same case with real estate investment (RE) and goodwill (GW). RE becomes from .186 in the prior to (.186 - .445) in the post, period, foreshadowing the fall of the real estate market. The decrease of the coefficient for GW also reflects the diminishing rate of return form merger and acquisition in the post period. These business combinations have incurred new risks in technical challenges and tax structure as well as other associated costs. From the statistical cost analysis point of view, the costs of (TA –TL) and RE have exceeded their profits in the post period.

The results of Equation (6), which can be interpreted as the market reaction to the information content of banks’ operating profiles, are presented in Panel B of Table 5. The discrepancies between the results of Equations (5) and (6) reveal the difficulty to value the related assets and liabilities because of unrecognized risks. While SCA relations exhibit some significant changes between the two periods, the differences in market responses are much drastic and varied, suggesting that while new accounting standards have helped improve disclosure transparency in bank financial reporting, markets still fail to fully recognize the cost of increased bank operating risk. It is of interest to notice that while the book value of (TA – TL) becomes from positive to negative in Equation (5), the trend is reversed in Equation (6), indicating a disassociation between the book value and market value of financial instruments. Furthermore, the significantly negative interaction of (LL – DP) with period dummy implies that banks have tried to finance their trading and other risk-related activities through higher leverage, liquidity mismatch or short-term funding, resulting in an increase in their cost of capital and a drop in banking earnings. Taken together, the results of Equations (5) and (6) support H3 that the repeal of GSA has significantly changed the Statistical Cost Relationship of bank earnings and, to an even greater extent, market valuation of bank operating profiles. The discrepancies between the SCA and market valuation models call into question the adequacy of accounting information to reflect the risk profiles of the deregulated banking system or the market’s ability to correctly interpret the accounting implication of such information.

The tests of the three hypotheses provide empirical evidence of a significant difference in the operating profile and results of the forty one bank holding companies in the sample following the repeal of SGA in 1999. The significant increase in banks’ market-sensitive assets and noninterest income led to a significant difference in bank accounting information content. During the test period, U.S. GAAP is undergoing a transition from historical cost to mark to the market. This gradual change in accounting principle results in the availability of three alternative measurements of bank earnings, namely, net income, comprehensive income and full-fair-value income. Hodder et al. (2006) investigate the risk relevance of the standard deviation of the three performance measures, and report that the volatility of full-fair-value income is more than five times that of net income, suggesting that full-fair-value income volatility reflects elements of risk that are not capture by volatility in net income, and relates more closely to capital market pricing of that risk than net income volatility. We use net income and its components as well as balance sheet items in the test of the three hypotheses. The test results show that while the new accounting standards have improved the association of bank price with the traditional bank earnings (asset/liabilities), the association of price with nontraditional earnings (assets/liabilities) has decreased as a result of the repeal of SGA. Our results support the conclusions of Hodder et al. (2006) that net income is insufficient in capturing the risk of the increasing portion of banks’ market-sensitive assets and noninterest income.

1. **Conclusion**

Financial institutions, including bank holding companies, have undergone almost a complete circle in regulatory regime change from the Glass-Steagall Act (GSA) in 1933 to its repeal by the Gramm-Leach-Bliley Act (GLBA) in 1999, followed by the Dodd-Frank Wall Street Reform and Consumer Protection Act (DFA) in 2010. This study documents how the deregulation of the financial markets allowed banks to expand into more market-sensitive business activities, which contributed to a significant increase in both of banks’ operating and accounting risks. Our test results provide evidence, first, on the importance of timely and accurate disclosure of bank risk exposure, and second, on the limitation of financial disclosure to meet the information requirements in the wake of the repeal of GSA in 1999. Bank accounting information, in particular, financial reporting of noninterest income and nontraditional assets/liabilities has decreased significantly in value relevance. The increase in the uncertainty of accounting information has a negative impact on the effectiveness of regulatory supervision.

The DFA recognizes the critical role of bank disclosure in its effort to “de-risk” the financial system by constraining individual organizations’ risk-taking activities and capturing a broader set of organizations in the regulatory net. The complexity of the financial industry’s infrastructure constitutes a key hindrance in identifying and measuring risk within the system. The DFA has not changed the fundamental structure of Wall Street, and banks are not barred from swaps trading. The law is also full of exemptions that allow banks to continue invest substantially in hedge and equity funds. The major financial institutions are able to keep the biggest part of their derivatives business in interest-rate and foreign-exchange swaps. The same banks may end up controlling or at least dominating the clearinghouses they are being pressed to trade on as well. New capital changes, meanwhile, have created barriers to enter for new firms. However, the consolidation of the existing elite organizations has in turn kept alive the “too big to fail” problem. The perennial question is how government regulators can keep up with private bankers’ complex inventions. Therefore, the lessons learned from the repeal of GSA are worth noting in addressing the financial institution data aggregation and integration requirement under the new law.

First, all financial institutions ought to be subject to a uniform set of disclosure requirements enforced by a single regulator. A disparate regulatory system will cause disclosure discrepancy and reduce comparability of financial reporting between different institutions. The reformed U.S. regulatory structure, although slightly simplified by DFA, has not been overhauled fundamentally and remains rather fragmented. This may pose a challenge to regulators in forming a comprehensive view of the aggregate risks in the financial system. Second, at the heart of the new law’s efforts at systematic de-risking and consumer protection are data aggregation and integration requirements to enhance timely and accurate reporting. The information demand is likely to shift continually as the regulator monitors different aspects of risk in the financial system. These new regulations support our argument that accounting information alone is unable to capture the risks banks’ overall business strategies are exposed to. Financial institutions may need to consider data quality and integration issues in additional areas, such as customer data, legal entity data, products codes, contract data, position data and transaction-level data to complement their financial reporting. Third, integrating data across an organization will not only provide comprehensive disclosure to users, but can also help the institutions themselves to reexamine their business models and yield significant benefits in the form of lower finance costs, more effective capital management, and more informed strategic management of business portfolios. The importance of the audit process for banks is also likely to intensify as regulatory changes increases the importance of market discipline in controlling bank risk-taking (Fields et al., 2004).

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Table 1. Descriptive Statistics (in millions of dollars)—Parametric Test

Panel A-Size

Post-Period Pre-Period

Variable Mean Std. Dev Mean Std. Dev t- value

Assets 127120 279500 35561 67920 10.786\*\*\*

Panel B-Variables from Income Statement

Post-Period Pre-Period

Variable Mean Std. Dev Mean Std. Dev t- value

NI 404 932 104 196 10.650\*\*\*

NII 902 1883 321 612 9.946\*\*\*

PL 128 356 41 125 7.864\*\*\*

NONII 900 2119 220 492 10.596\*\*\*

TR 90 333 11 60 7.861\*\*\*

GLL 19 94 3 17 2.912\*\*\*

GLS 14 104 5 30 5.442\*\*\*

Panel C-Variables from Balance Sheet

Post-Period Pre-Period

Variable Mean Std. Dev Mean Std. Dev t- value

GS 18494 37330 4671 9025 12.196\*\*\*

LL 63160 118700 21103 38510 11.415\*\*\*

TA 15157 54560 2296 9198 7.876\*\*\*

IS 353 1050 63 217 9.172\*\*\*

RE 96 448 11 55 6.431\*\*\*

GW 3133 8109 272 924 11.462\*\*\*

DP 51855 91680 17798 27120 12.069\*\*\*

TL 7790 27450 1406 6211 7.685\*\*\*

BW 16112 40610 3177 6281 10.666\*\*\*

\*\*\* denotes statistical significance at 1% level.

D= Period Dummy. 0 for the pre-period of 1992-1998; 1for the post-period of 2000-2006

NI=Net Income

NII=Net Interest Income

PL=Provision Losses

NONII=Non-interest Income

TR=Trading Revenues

GLL=Gains/Losses on Loans

GLS=Gains/Losses on Securities

GS=Government Securities

LL=Loans and Leases

TA=Trading Assets

IS=Investments in Subsidiaries

RE=Investments in Real Estate

GW=Goodwill

DP=Deposits

TL=Trading Liabilities

BW=Borrowings

Table 2. Descriptive Statistics (in millions of dollars) –Wilcoxon Signed Rank Test

Panel A-Size

Mean Rank

Variable Positive Ranks Negative Ranks Positive Negative z- value

Assets 1121 27 585.13 132.96 29.030\*\*\*

Panel B-Variables from Income Statement

Mean Rank

Variable Positive Ranks Negative Ranks Positive Negative z- value

NI 1106 42 579.07 454.12 27.652\*\*\*

NII 1088 60 590.53 283.85 27.833 \*\*\*

PL 890 237 600.70 426.18 19.838\*\*\*

NONII 1140 8 577.07 208.63 29.201\*\*\*

TR 785 130 485.29 293.22 21.437 \*\*\*

GLL 826 201 535.56 425.39 18.767 \*\*\*

GLS 656 437 568.43 514.82 7.085\*\*\*

Panel C-Variables from Balance Sheet

Mean Rank

Variable Positive Ranks Negative Ranks Positive Negative z- value

GS 1057 91 592.54 364.93 26.394\*\*\*

LL 1107 41 586.77 243.17 28.462\*\*\*

TA 817 118 500.45 243.33 23.012\*\*\*

IS 729 192 506.58 287.93 19.443\*\*\*

RE 230 213 271.71 168.32 4.941\*\*\*

GW 1069 79 606.92 135.79 28.394\*\*\*

DP 1136 12 580.16 38.33 29.308\*\*\*

TL 627 44 351.12 120.59 21.385\*\*\*

BW 984 164 602.73 405.09 23.436\*\*\*

\*\*\* denotes statistical significance at 1% level.

Positive Ranks: numbers of a variable value in post-period greater than that in pre-period.

Negative Ranks: numbers of a variable value in post-period less than that in pre-period.

Total data set: N = 2296 (i.e., 1148 observations in pre-period vs. 1148 observations in post-period)

Table 3. Regression Results of Equation (1)

Dependent Variable: Bank Return

N =140341 F Value = 7617.99 Significance =.000 Adj. R² = .140

Variable Coefficients Std. Error t-value Significance

Constant .001 .000 12.85 .000

MktReturn .593 .008 71.99 .000

D .000 .000 -3.64 .000

D\*MktReturn .220 .010 21.39 .000

D= Period Dummy. 0 for the pre-repeal period of 1992-1998; 1for the post-repeal period of 2000-2006

MktReturn = Market return, proxied by the S&P 500 index

Table 4. Regression Results of Equations (2), (3) and (4)

Panel A – Equation (2)

Dependent Variable: Bank Market Value

N =2296 F Value = 2700.399 Significance =.000 Adj. R² = .779

Variable Coefficients Std. Error t-value Significance

Constant 102.324 24.652 4.151 .000

NI 45.288 1.342 33.738 .000

D 265.645 33.102 8.052 .000

D\*NI -1.858 1.459 -1.274 .203

Panel B – Equation (3)

Dependent Variable: Bank Market Value

N =2296 F Value = 1939.024 Significance =.000 Adj. R² = .855

Variable Coefficients Std. Error t-value Significance

Constant 62.418 22.226 2.808 .005

NII 11.140 .778 14.324 .000

PL -38.131 2.783 -13.699 .000

NONII 13.604 .930 14.634 .000

D 30.440 30.481 .999 .318

D\*NII 6.484 .934 6.943 .000

D\*PL 24.682 3.307 7.464 .000

D\*NONII -5.827 .997 -5.843 .000

Panel C – Equation (4)

Dependent Variable: Bank Market Value

N =2296 F Value = 1066.015 Significance =.000 Adj. R² = .836

Variable Coefficients Std. Error t-value Significance

Constant 103.007 24.080 4.278 .000

NII 15.581 .662 23.542 .000

PL -25.202 2.804 -8.988 .000

TR 49.761 4.447 11.190 .000

GLL 15.838 9.508 1.666 .096

GLS 42.229 7.729 5.464 .000

D -24.628 32.822 -.750 .453

D\*NII 8.292 .790 10.497 .000

D\*PL 10.245 3.401 3.013 .003

D\*TR -33.070 4.707 -7.025 .000

D\*GLL -22.350 9.803 -2.280 .023

D\*GLS -38.889 8.383 - 4.639 .000

Notes:

All variables are deflated by square root of assets

D= Period Dummy. 0 for the pre-repeal period of 1992-1998; 1for the post-repeal period of 2000-2006

Table 5. Regression Results of Equation (5) and (6)

Panel A-Equation (5)

Dependent Variable: Bank Earnings

N =2296 F Value = 564.764 Significance =.000 Adj. R² = .787

Variable Coefficients Std. Error t-value Significance

Constant 6.177 .5 12.361 .000

GS .003 .001 5.779 .007

LL-DP .001 .000 3.039 .002

TA-TL .006 .002 2.392 .017

IS .100 .036 2.775 .006

RE .186 .083 2.237 .025

GW .052 .007 6.956 .000

BW .007 .001 7.344 .000

D -1.828 .735 -2.485 .013

D\*GS .002 .001 2.254 .024

D\*(LL-DP) .001 .001 1.064 .287

D\*(TA-TL) -.011 .002 -4.543 .000

D\*IS .046 .039 1.174 .241

D\*RE -.445 .088 -5.057 .000

D\*GW -.021 .008 -2.670 .008

D\*BW .003 .001 2.351 .019

Panel B-Equation (6)

Dependent Variable: Market Value

N =2296 F Value = 636.472 Significance =.000 Adj. R² = .806

Variable Coefficients Std. Error t-value Significance

Constant 331.772 24.517 13.532 .000

GS .303 .029 10.353 .000

LL-DP .198 .023 8.698 .000

TA-TL -.634 .116 -5.473 .000

IS 2.333 1.774 1.315 .189

RE 13.471 4.089 3.295 .001

GW 4.601 .364 12.624 .000

BW 172 .048 3.561 .000

D -18.782 36.075 -.521 .603

D\*GS .112 .036 3.147 .002

D\*(LL-DP) - .053 .029 -1.846 .065

D\*(TA-TL) .387 .120 3.233 .002

D\*IS .740 1.922 .385 .700

D\*RE -25.027 4.318 -5.796 .000

D\*GW -3.244 .389 -8.351 .000

D\*BW .279 .063 4.414 .000

Notes:

All variables are deflated by square root of assets

D= Period Dummy. 0 for the pre-repeal period of 1992-1998; 1for the post-repeal period of 2000-2006.