

THE EFFECT OF SARBANES-OXLEY ON AUDIT FEES

By

Alexander Stephen Kier

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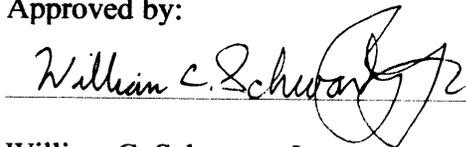
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Approved by:



William C. Schwartz, Jr.
Accounting Department, Eller College of Management

The Effect of Sarbanes-Oxley on Audit Fees

Abstract

I examine the effect of the Sarbanes-Oxley (SOX) act on audit fees. SOX is intended to improve the overall quality of financial reporting by raising the standards of corporate transparency. However, these improved standards do not come without an added cost. I expect audit fees to increase significantly in the post-SOX (2003-2006) period. In addition, the largest increase in audit fees is expected to affect the Big 4 public accounting firms and the largest asset size clients more than Non Big 4 firms and smaller size clients. The results indicate a substantial increase of 162% in average audit fees for all firms from the pre-SOX (2002) period to the post-SOX (2006) period. Big 4 accounting firms experience the largest increase in average audit fees of 195% after SOX. After controlling for the size of the client, and risk or complexity of the audit, regression analysis is used to test the hypotheses. The results, which are statistically significant at 1% level, indicate that average audit fees increase for all firms by \$685,794 in the post-SOX period. Furthermore, as expected, audit fees increase even more as the size of the client increases. Thus, the Big 4 accounting firms and the largest asset size clients are most affected by SOX.

1. Introduction

Sarbanes-Oxley (SOX) enacted on July 30, 2002, established new laws and standards for all United States publicly traded companies, their respective boards, firm management, and public accounting firms. The wide-ranging legislation was called by President George W. Bush to be “the most far-reaching reforms of American business practices since the time of Franklin D. Roosevelt” (Bumiller 1). These reforms were created in direct response to the downfall of the largest public accounting firm at the time, Arthur Anderson LLP, and two of its major clients, Enron and WorldCom.

On December 2, 2001, intense pressure from creditors, pending litigation against the company and its officers, and investigations by law enforcement, forced Enron to file for bankruptcy (Knapp 9). At the time of its bankruptcy filing, Enron owed approximately \$67 billion to creditors, making it the largest corporate bankruptcy in U.S. history (PBS 1). “Enron’s claim to fame would be eclipsed the following year by more than \$100 billion of losses produced when another Anderson client, WorldCom, filed for bankruptcy” (Knapp 9). Furthermore, in June of 2002, after a federal jury found Anderson guilty of obstruction of justice, the conviction forced Anderson to terminate its relationships with all remaining public clients, effectively putting the largest public accounting firm out of business, resulting in the loss of 85,000 jobs (Arthur 1).

Sarbanes-Oxley, proposed by Paul Sarbanes from the Senate Banking Committee, and Mike Oxley from the House Committee of Financial Services was created as a direct response to these corporate accounting scandals discussed above. The legislation is intended to improve the overall quality of financial reporting by raising the standards of corporate transparency and accountability. In addition, the legislation drives the

development of stronger internal control processes raising investor confidence. However, SOX substantially increases the cost of this improved financial reporting.

This paper has three main research questions that examine the effects of Sarbanes-Oxley on the costs that publicly traded firms incur regarding audit fees. The first research question is: have audit fees increased since post Sarbanes-Oxley? If so, who is affected by this change? The second research question examines the difference between Big 4 (PricewaterhouseCoopers, Ernst & Young, Deloitte, and KPMG) versus Non Big 4 firms. Specifically, does the size of the audit firm affect the change in audit fees caused by Sarbanes-Oxley? The third research question examines the difference between large engagement versus small engagement audits. That is, does the size of client affect the change in audit fees impacted by Sarbanes-Oxley?

Many parties would be interested in this research. First, public corporations need to understand the financial effect of SOX as it relates to changes in internal costs and external audit fees. Second, public accounting firms would be interested to understand how the market for their services is reacting, and how it may react in the future to this relatively new regulation. Finally, members of congress and accounting policy makers such as the Securities and Exchange Commission (SEC) and Public Accounting Oversight Board (PCAOB) would be the most interested in this research in order to understand the consequences of the enacted legislation. Furthermore, this research could influence future legislation if it is found that SOX was ineffective in balancing the added costs of regulation with the added benefits of improved financial reporting.

My analysis is based on data from the *Audit Analytics* Database. The database compiles audit fee data from publicly available proxy statements filed with the SEC. In

November of 2000, the SEC issued revised auditor independence rules that requires all publicly held firms to disclose their audit fees in proxy statements after February 5, 2001. Therefore, approximately two years of published audit fee data exists before the passing of Sarbanes-Oxley. I then collect SEC filing data after the implementation of SOX, and compare the two periods. I use the *Audit Analytics* database for the audit fee data for fiscal years 2000 through 2006.

My research finds significant increases in total and average audit fees after the passing of SOX. Total audit fees for all firms increase by 82% from the pre-SOX period (2002) to the post-SOX period (2006). Average audit fees for all firms increase by \$825,023 or 162% due to SOX. This increase in audit fees disseminates throughout the entire audit fee market, but is most concentrated in Big 4 firms in which average audit fees increase by \$1,357,582 or 195%. Average audit fees increase by 128% for Non Big 4 firms, confirming my hypothesis that larger accounting firms (Big 4) experience the largest increase in audit fees due to SOX. After using regression analysis and controlling for the size of the client, and risk or complexity of the audit, I find statistically significant results that indicate that average audit fees increase by \$685,794 in the post-SOX period. Furthermore, I observe an even larger increase in average audit fees in the post-SOX period as the size of the client, measured by total assets, increases. Thus, the leading accounting firms (Big 4) increased their audit fees for their largest asset clients because of the passing of SOX.

The remainder of the paper is organized as follows. Section 2 discusses the background of the legislation and develops my hypotheses. Section 3 describes the research design and empirical results. Section 4 concludes the paper.

2. Background and Hypothesis Development

2.1 Collapse of Enron, WorldCom, and Arthur Anderson LLP

Enron Corporation, an American Energy company based in Houston, Texas, was once the world's leading electricity, natural gas, and communications company with reported earnings of \$111 billion in 2000, and estimated market capitalization of \$65 billion (Glassman 1). Fortune magazine named Enron "America's Most Innovative Company for six consecutive years from 1996 to 2001 (Enron 07). The truth is that their innovation was not in their energy sales, but rather in their fraudulent financial reporting. Enron used SPE's, or special purpose entities, as well as many other off-balance sheet accounting tricks to inflate their reported profits by \$600 million over the course of a five year period (1997-2001).

After whistle blower, Sharon Watkins, who was an employee of Enron helped to uncover the fraud, Enron was forced to restate its financial statements causing its stock to plummet. In a matter of months, Enron Corporation went from being one of the most powerful companies on Wall Street to utter failure with losses estimated at over \$60 billion to shareholders alone. On December 2, 2001, Enron Corporation declared bankruptcy losing almost their entire market capitalization. Over the following months and years, Enron's top officials Kenneth Lay, Jeffrey Skilling, and Andrew Fastow were prosecuted and sentenced by a federal court on criminal charges for conspiracy to commit securities fraud, as well as other charges of insider trading, and making false statements to auditors (Knapp 9).

A similar story occurred less than a year later with WorldCom, an American telecommunications company, who was the second largest long distance phone company

second only to AT&T in the late 1990's. From the beginning of 1999 through May of 2002, WorldCom committed fraud by underreporting expenses and overstating revenues. Eventually, WorldCom's external auditor, KPMG, uncovered the fraud that overstated assets by \$11 billion (MCI 3). With a pending investigation by the Securities and Exchange Commission, the stock price fell into a downward spiral causing WorldCom to file for chapter 11 bankruptcy on July 21, 2002 with losses of more than \$100 billion, the largest in U.S. history. WorldCom's top officers, Bernard Ebbers, Scott Sullivan, and David Myers all received federal prosecution and sentencing for securities fraud.

The collapse of Enron and WorldCom may have been prevented by their principal external auditor, Arthur Anderson LLP, which eventually was held legally responsible for the fraud and that ultimately resulted in their own failure. Anderson was the largest of the "Big 5" public accounting firms with a noble reputation leading the industry in developing new auditing standards. Their reputation crumbled after they were convicted by the Department of Justice for their involvement in the audit failure of Enron. Specifically, lead partner on the Enron engagement, David Duncan, was responsible for shredding relevant Enron documents that helped the obstruction of justice conviction. The conviction forced Anderson to surrender all relationships with its public clients effectively ending the company's operations (Arthur 3). After another Anderson audit failure and subsequent collapse of WorldCom less than a year later from Enron, it became clear that the U.S.'s leading accounting firm would never recover. The destruction of Anderson resulted in the loss of 85,000 jobs and the movement for legislation reform was in full swing.

2.3 Sarbanes-Oxley

The answer to the accounting scandals of the new millennium is the passing of Sarbanes-Oxley on July 30, 2002. The bi-partisan legislation proposed by Paul Sarbanes, from the Senate Banking Committee, and Mike Oxley from the House Committee of Financial Services creates a new regulatory agency, which operates as a non-profit organization, called the Public Accounting Oversight Board (PCAOB). The new agency improves the regulation process by disbanding the ineffective old practice of self-regulation, and establishes an independent board. The agency is comprised of five members, appointed by the SEC, which has the direct responsibility in “overseeing, regulating, inspecting, and disciplining accounting firms in their roles as auditors of public companies” (“Sarbanes-Oxley Act”). The purpose of the PCAOB is to protect the interests of the public by ensuring the preparation of informative, accurate, and independent audit reports. In addition, the board is responsible for setting standards regarding auditing, quality control, ethics, and independence. They also enforce the legal compliance of these new standards by inspecting auditing firms, and disciplining the noncompliant firms.

This legislation itself contains eleven titles intended to improve the overall quality of financial reporting. The first title creates the PCAOB, explained above, which provides independent oversight of public accounting firms. The second title further defines auditor independence by addressing potential auditor conflicts of interest. Most notably, the second title disallows audit companies from providing non-audit or consulting services as well as standard audit services to the same client. The third title mandates corporate responsibility, especially for senior management, who must sign-off

on the completeness and validity of the financial statements. The fourth section, labeled enhanced financial disclosures, not only requires internal controls to assure the accuracy of the financial statements, but also requires the auditor to report on those controls. Title five and six further define the role of security analysts, while title seven calls for the research of enforcing actions. The remaining titles define specific criminal penalties for fraudulent reporting, manipulation, or any other white-collar crimes or conspiracies.

2.4 Cost of Sarbanes-Oxley

All of the titles above intend to improve investor confidence by increasing auditor independence and the transparency of financial statements, but not without substantial costs. These costs attributed to SOX range from increases in audit fees to internal control infrastructure. Many experts claim the largest increase in cost is from section 404, which forces management and the auditor to report on the company's internal controls. SOX section 404 requires a substantial amount of effort to test and document a company's entire internal controls system. Section 404 receives the most attention because it decreases the bottom line of publicly traded companies.

The truth is that SOX has additional expenses outside the increase of internal control cost. U.S. national law firm, Foley and Lardner LLP, recently conducted their own study in 2007 on the cost of SOX and found that average audit fees have increased by 189% from 2001-2006 for firms in the S&P 500. That is an average increase of \$5,789,000 for S&P firms directly attributed to SOX (Hartman 8).

Many parties would be interested in this research. First, public corporations need to understand the financial effect of SOX as it relates to changes in internal costs and external audit fees. Second, public accounting firms would be interested to understand

how the market for their services is reacting, and how it may react in the future to this relatively new regulation. Finally, members of congress and accounting policy makers like the SEC and PCAOB would be the most interested in this research in order to understand the consequences of the enacted legislation. Furthermore, this research could influence future legislation if it is found that SOX was ineffective in balancing the added costs of regulation with the added benefits of improved financial reporting.

2.5 Hypothesis Development

Sarbanes-Oxley has had tremendous effects on the audit fee market. SOX requires a considerable amount of more work in a standard audit. Auditors are now forced to not only test the internal controls of publicly held corporations, but must extensively document those controls. This requires a substantial amount of work, and would thus result in a substantially higher audit fee. Therefore, I hypothesize the following with respect to research question one:

H1: SOX has increased audit fees.

This means that the audit fees paid by a company for a standard audit has substantially increased due to SOX relative to what that same company paid before the passing of SOX. The increase in fee will be related to the size of the auditor and client, and risk or complexity of the audit. Accordingly, I control for these relations in order to isolate the increase in fee from the pre-SOX period to the post-SOX period to the implementation of the legislation.

After the fall of Arthur Anderson LLP, and realignment of the market, the Big 4 public accounting firms (PricewaterhouseCoopers, Ernst & Young, Deloitte, and KPMG) audit the majority of the fortune 500 companies. Because the audits of these major corporations tend to be the most expensive in the first place, I expect Big 4 audit fees to experience the largest increase due to SOX. Thus, I hypothesize the following with respect to research question two:

H2: Big 4 audit fees increased more than Non Big 4 audit fees after SOX.

This means the percent increase in price charged for an audit by a Big 4 public accounting firm post-SOX is larger than the percent increase in price charged by a Non Big 4 accounting firm. This increase in fee will also be adjusted for the size of the client, as well as the risk or complexity of the audit in order to isolate the effects of SOX.

The majority of Big 4 clients are considered large market cap fortune 500 companies. Because I believe the largest increase in fee will come from the Big 4 accounting firms, which perform the majority of the large size client audits, I hypothesize the following with respect to research question three:

H3: Large client audit fees have increased more than small client audit fees.

This means large public clients will be associated with larger increases in audit fees than smaller public clients due to SOX. Again, I control for the size of the client, and complexity or risk in the audit.

3. Research Design and Empirical Results

3.1 Sample

The data used in this research for fiscal years 2000 through 2006 is gathered from the *Audit Analytics* database, which compiles audit fee information based on publicly available proxy statements filed with the SEC. Two years of published data exists before the passing of SOX because the SEC required firms to disclose all fees after February 5, 2001. This data from pre-SOX (2000 - 2002) is then compared with the audit fee data from post-SOX (2003 - 2006).

The entire sample consists of 65,536 observations in the *Audit Analytics* database from 2000 through 2006. The sample is then broken down and sorted by fiscal year and auditor to examine the proposed research questions. Observations with a zero for audit fees in the database are removed from the sample because the information is considered missing. The number of observations for fiscal year 2000 and 2001 are 4,868 and 7,124 respectively, which appear to be incomplete when compared to the number of observations for each subsequent year after, which averages around 10,000 observations. The database does not contain as many observations for fiscal years 2000 and 2001 because firms were not required to disclose audit fee information until after February 5, 2001. Therefore, the database sample is not representative of the audit market until fiscal year 2002. As a result, most of the analysis uses fiscal year 2002 to represent the time period before SOX. Consistent with prior research from Felix, Gramling and Maletta

(2001), Asthana, Balsam, and Kim (2004), and Ghosh and Pawlewicz (2008), I control for the size of the client, as well as the risk or complexity of the audit. Auditor size is classified by two groups: Big 4 versus Non Big 4 firms. Big 4 firms (PricewaterhouseCoopers, Ernst & Young, Deloitte, and KPMG) are considered to be large size auditors, while Non Big 4 auditors are considered small size auditors. Client size is measured by the total assets (Compustat data item #6) at fiscal year-end. Complexity or risk of the audit is measured by a firm's leverage, calculated as the proportion of total liabilities (Compustat data item #181) to total assets (Compustat data item #6) at fiscal year-end. All sample variables are truncated at 1% and 99% to mitigate the effect of outliers.

3.2 Descriptive Statistics

Figure 1 plots the total audit fees for All Firms and Big 4 firms from 2002 through 2006. Figure 1 shows a dramatic increase in audit fees for All Firms and Big 4 firms after the passing of SOX. For instance, total audit fees increase for All Firms from \$5.122 trillion in 2002 to \$9.347 trillion in 2006. This is an increase of 82%. Similarly, Big 4 audit fees increase from \$4.841 trillion in 2002 to \$8.785 trillion in 2006, which is an increase of 81%. Therefore, it is evident that audit fees increase after the passing of SOX, driven by Big 4 audit fees.

Figure 2 plots the average audit fees for All Firms and Big 4 firms from 2002 through 2006. Figure 2 shows the dramatic increase in average audit fees for both groups after the passing of SOX. For instance, average audit fees increase for All Firms from \$508,114 in 2002 to \$1,333,137 in 2006. This is an increase of 162%. Similarly, Big 4 average audit fees increase from \$695,410 in 2002 to \$2,052,992 in 2006, which is an

increase of 195%. The results in Figure 2 are consistent with the results in Figure 1 in which audit fees increase after the passing of SOX, driven by Big 4 firms.

Figure 3 plots the cumulative percent change of total and average audit fees for All Firms from 2002 through 2006. Figure 3 shows the dramatic increase in total and average audit fees of 82% from 2002 to 2006 and 162% from 2002 to 2006 respectively. Figure 4 mirrors the image of Figure 3, which plots the cumulative percent change of total and average audit fees for Big 4 firms from 2002 to 2006. These figures demonstrate that Big 4 firms drive the entire audit fee market, which experiences an increase in total and average audit fees after the passing of SOX.

Figure 5 plots the cumulative percent change of average audit fees from 2002 through 2006 for All Firms, Big 4 firms, and Non Big 4 firms. All Firms experience an increase in average audit fees of 162% from 2002 to 2006, while Big 4 firms experience the largest increase of 195%, and Non Big 4 firms experience the smallest increase of 128%. The average audit fees for all three groups increase dramatically after the passing of SOX. Consistent with each preceding figure, audit fees increase due to the passing of SOX, which is driven by Big 4 firms.

Figure 6 plots the cumulative percent change of average audit fees for each Big 4 firm from 2002 through 2006. Ernst & Young experienced the largest increase in average audit fees of 220% from 2002 to 2006, followed by PricewaterhouseCoopers at 210%, Deloitte at 201%, and KPMG at 147%. Consistent with Figure 4 and Figure 5, Big 4 audit fees increase dramatically after the passing of SOX.

Table 1 displays the total and average audit fees from 2000 to 2006 for All Firms, Big 4 firms, and Non Big 4 firms. Table 2 displays the cumulative percent change of

those audit fees. Panel A of both tables measure all the firms in the sample, which includes Big 4 and Non Big 4 auditors. Total audit fees increase for All Firms from the pre-SOX period (2002), of \$5,122,298,753, to the post-SOX period (2006) of \$9,346,622,024. This represents an increase of 82%. Average audit fees increase even more for All Firms from the pre-SOX period of \$508,114 to the post-SOX period of \$1,333,137 (162%). This descriptive evidence is consistent with hypothesis H1 in which SOX has increased audit fees.

Panel B of Table 1 and Table 2 displays the increase in total and average audit fees for Big 4 public accounting firms. Total audit fees and average audit fees for Big 4 firms increase from the pre-SOX period (2002), \$4,840,751,037 and \$695,410 respectively to the post-SOX period (2006) of \$8,784,750,951, and \$2,052,992 respectively. This is an increase of 81% for total audit fees and 195% for average audit fees. It also evident from Table 1 that Big 4 audit fees have consistently made up 94% [$8,784,750,951 / 9,346,622,024$] of total audit fees from all firms in the market since the passing of SOX. This descriptive evidence is consistent with my hypothesis that Big 4 audit fees drive the entire audit fee market.

Panel C of table 1 and Table 2 displays the increase in total and average audit fees for Non Big 4 public accounting firms, but not by the same magnitude of Big 4 firms. Average audit fees for Non Big 4 firms in the pre-SOX period (2002) increase from \$90,240 to \$205,663 in the post-SOX period (2006). This is a 128% increase, which is less than the Big 4 increase of 195%. Therefore, consistent with hypothesis H2, Big 4 audit fees increase more than Non Big 4 audit fees after SOX.

Table 3 breaks down the Big 4 into each specific auditor and shows the increase in total and average audit fees for each public accounting firm. Table 4 shows the cumulative percent change of those audit fees. PricewaterhouseCoopers experienced the largest increase in audit fees of \$1,180,641,372 [2,644,017,052 – 1,463,375,680] from the pre-SOX period (2002) to the post-SOX period (2006), followed by Ernst & Young \$1,108,239,234 [2,254,829,896 – 1,146,590,662], Deloitte \$1,038,235,945 [2,117,828,709 – 1,079,592,764], and KPMG \$616,883,363 [1,768,075,294 – 1,151,191,931]. Although, Ernst & Young demonstrated the highest cumulative percent change of average audit fees from 2002 to 2006 at 220%, followed by PricewaterhouseCoopers at 210%, then Deloitte at 201%, and finally KPMG at 147%. Consistent with Table 1 and Table 2, Big 4 audit fees increase after the passing of SOX.

3.3 Model Specification

In order to investigate the first research question as to whether audit fees have increased since post Sarbanes-Oxley, I estimate the influence of SOX on audit fees using the following regression model:

$$Audit\ Fees = \beta_0 + \beta_1 Sox + \beta_2 Auditor + \beta_3 Assets + \beta_4 Leverage \quad (1)$$

Audit Fees are the fees paid to the external auditor for the fiscal year's financial statement audit (from audit analytics database). The dummy variable *Sox* [β_1] equals one if the fiscal year ends after 2002. A positive coefficient on *Sox* [β_1] indicates that average audit fees increase after SOX. *Auditor* [β_2] is a dummy variable that equals one when

the external auditor is a Big 4 accounting firm and zero otherwise. A positive coefficient on *Auditor* [β_2] indicates that average audit fees are higher for Big 4 auditors than Non Big 4 auditors in the post-SOX period. *Assets* [β_3] is a control variable that equals the total assets for a client at the end of the fiscal year. *Leverage* [β_4] is a control variable that captures the client risk or audit complexity calculated as the proportion of total liabilities to total assets at fiscal year-end. Consistent with prior research from Felix, Gramling and Maletta (2001), Asthana, Balsam, and Kim (2004), and Ghosh and Pawlewicz (2008), I expect positive coefficients on the control variables, indicating that audit fees increase as assets and leverage increase.

To test H2, I modify equation (1) to include the interaction between *Sox***Auditor*. This tests whether the increase in audit fees post-SOX is larger for Big 4 firms over Non Big 4 firms. Specifically, I estimate the following regression model:

$$Audit\ Fees = \delta_0 + \delta_1 Sox + \delta_2 Sox * Auditor + \delta_3 Auditor + \delta_4 Assets + \delta_5 Leverage \quad (2)$$

All variables are the same as defined above in regression equation (1). A positive coefficient on *Sox* [δ_1] indicates that average audit fees increase after SOX. A positive coefficient on the *Sox***Auditor* [δ_2] variable indicates that Big 4 firms experience a larger average increase in audit fees for the post-SOX period than Non Big 4 firms. A positive coefficient on *Auditor* [δ_3] indicates that average audit fees are higher for Big 4 auditors than Non Big 4 auditors in the post-SOX period. Consistent with prior research

from Felix, Gramling and Maletta (2001), Asthana, Balsam, and Kim (2004), and Ghosh and Pawlewicz (2008), I expect positive coefficients on the control variables, indicating that audit fees increase as assets and leverage increase.

The external audits of the largest corporations are performed mostly by the Big 4 public accounting firms. These audits tend to have the largest audit fees. Therefore, I expect those audits to experience the largest increase in audit fees due to SOX. I test whether the increase in audit fees post-SOX increases more for larger clients than smaller clients by modifying equation (1) to include the interaction between *Sox*Assets*. Specifically, I estimate the influence of SOX on audit fees for larger asset clients using the following regression model:

$$Audit\ Fees = \lambda_0 + \lambda_1 Sox + \lambda_2 Sox * Assets + \lambda_3 Auditor + \lambda_4 Assets + \lambda_5 Leverage \quad (3)$$

All variables are the same as defined above in the regression equation (1). A positive coefficient on *Sox* [λ_1] indicates that average audit fees increase after SOX. A positive coefficient on the *Sox*Assets* [λ_2] variable indicates that larger asset clients experience a larger average increase in audit fees for the post-SOX period than compared to smaller asset clients. A positive coefficient on *Auditor* [λ_3] indicates that average audit fees are higher for Big 4 auditors than Non Big 4 auditors in the post-SOX period. Consistent with prior research from Felix, Gramling and Maletta (2001), Asthana, Balsam, and Kim (2004), and Ghosh and Pawlewicz (2008), I expect positive coefficients on the control variables, indicating that audit fees increase as assets and leverage increase.

3.3 Test Results

Panel A of Table 5 presents the results of regression equation (1), which examines whether the increase in audit fees subsequent to SOX is significant after controlling for the size of the client, and risk or complexity of the audit. Consistent with my first hypothesis, the coefficient on *Sox* [$\beta_1 = 685,794$, $t\text{-stat} = 29.35$] is positive and statistically significant at the 1% level. This means that after controlling for the size of the client, and risk or complexity of the audit, average audit fees are \$685,794 higher in the post-SOX period. The coefficient on *Auditor* [$\beta_2 = 777,754$, $t\text{-stat} = 29.35$] is positive and statistically significant at the 1% level. This means average audit fees are \$777,754 higher for Big 4 firms in the post-SOX period. Consistent with prior research from Felix, Gramling and Maletta (2001), Asthana, Balsam, and Kim (2004), and Ghosh and Pawlewicz (2008), the coefficient on *Assets* [$\beta_3 = 41.25$, $t\text{-stat} = 50.46$] and *Leverage* [$\beta_4 = 454,822$, $t\text{-stat} = 10.68$] control variables are positive and statistically significant. This indicates that audit fees increase as client assets and leverage increase.

Panel B of Table 5 presents the results of regression equation (2) in which I add the interaction of *Sox* and *Auditor*. Regression equation (2) examines whether Big 4 firms experience a larger increase in audit fees over Non Big 4 firms after controlling for the size of the client, and risk or complexity of the audit. The coefficient on *Sox* [$\delta_1 = 31,141$, $t\text{-stat} = 0.69$] is statistically indistinguishable from zero. Consistent with my second hypothesis, the coefficient on the *Sox*Auditor* [$\delta_2 = 889,646$, $t\text{-stat} = 16.90$] is positive and statistically significant at the 1% level. This means that after controlling for the size of the client, and risk or complexity of the audit, average audit fees are \$889,646

higher for Big 4 firms in the post-SOX period. The coefficient on *Auditor* [$\delta_3 = 253,646$, $t\text{-stat} = 6.26$] is positive and significant at the 1% level. This means average audit fees are \$253,646 higher for Big 4 firms in the post-SOX period. Consistent with prior research from Felix, Gramling and Maletta (2001), Asthana, Balsam, and Kim (2004), and Ghosh and Pawlewicz (2008), the coefficient on the *Assets* [$\delta_4 = 40.85$, $t\text{-stat} = 50.28$] and *Leverage* [$\delta_5 = 458,338$, $t\text{-stat} = 10.83$] control variables are positive and statistically significant at the 1% level. This indicates that audit fees increase as client assets and leverage increase. Therefore, Big 4 firms experience a larger increase in average audit fees in the post-SOX period than Non Big 4 firms.

Panel C of Table 5 presents the results of regression equation (3), in which I add the interaction of *Sox* and *Assets*. Regression equation (3) examines whether larger asset size clients experience a larger increase in audit fees after SOX over smaller asset size clients. Consistent with my third hypothesis, the coefficient on *Sox* [$\lambda_1 = 604,981$, $t\text{-stat} = 25.09$] is positive and statistically significant at the 1% level. In addition, the coefficient on *Sox*Assets* [$\lambda_2 = 23.23$, $t\text{-stat} = 12.87$] is positive and statistically significant at the 1% level. This means that after controlling for the size of the client, and risk or complexity of the audit, average audit fees are higher for larger asset size clients in the post-SOX period. The coefficient on *Auditor* [$\lambda_3 = 779,364$, $t\text{-stat} = 29.79$] is positive and statistically significant at the 1% level. This means average audit fees are \$779,364 higher for Big 4 firms in the post-SOX period. Finally, consistent with prior research from Felix, Gramling and Maletta (2001), Asthana, Balsam, and Kim (2004), and Ghosh and Pawlewicz (2008), the coefficient on the *Assets* [$\lambda_4 = 24.00$, $t\text{-stat} =$

15.30] and *Leverage* [$\lambda_5 = 467,610$, $t\text{-stat} = 11.02$] control variables are positive and statistically significant at the 1% level. Therefore, larger asset size clients experience an even larger increase in average audit fees due to SOX.

4. Conclusion

This research paper examines the effect of Sarbanes-Oxley on audit fees. I hypothesize that not only did audit fees increase because of SOX, but that Big 4 accounting firms and large clients experience the largest increase in audit fees. Drawing upon a large sample from the *Audit Analytics* database for fiscal years 2000 through 2006, I find a large increase in total and average audit fees for the post-SOX period. Total audit fees for All Firms increase by \$ 4,224,323,271 from the pre-SOX period (2002) to the post-SOX period (2006), which is an 82% increase. Average audit fees for All Firms increase from \$508,114 to 1,333,137 from the pre-SOX period to the post-SOX period. This is an increase of \$825,023 or 162%. Big 4 accounting firms experience the largest increase in average audit fees from \$695,410 in the pre-SOX period to 2,052,992 in the post-SOX period. This is an increase of \$1,357,582 or 195%. This increase in average audit fees is larger than the increase in average audit fees of 128% for Non Big 4 accounting firms.

Regression analysis is used to test the statistical significance of my hypotheses. After controlling for the size of the client, as well as the risk or complexity of the audit, average audit fees increase by \$685,794 [$t\text{-stat} = 29.35$] in the post-SOX period. Furthermore, Big 4 accounting firms experience a larger increase in average audit fees of \$889,646 [$t\text{-stat} = 16.9$] over Non Big 4 Firms in the post-SOX period. Finally, consistent with prior research from Felix, Gramling and Maletta (2001), Asthana,

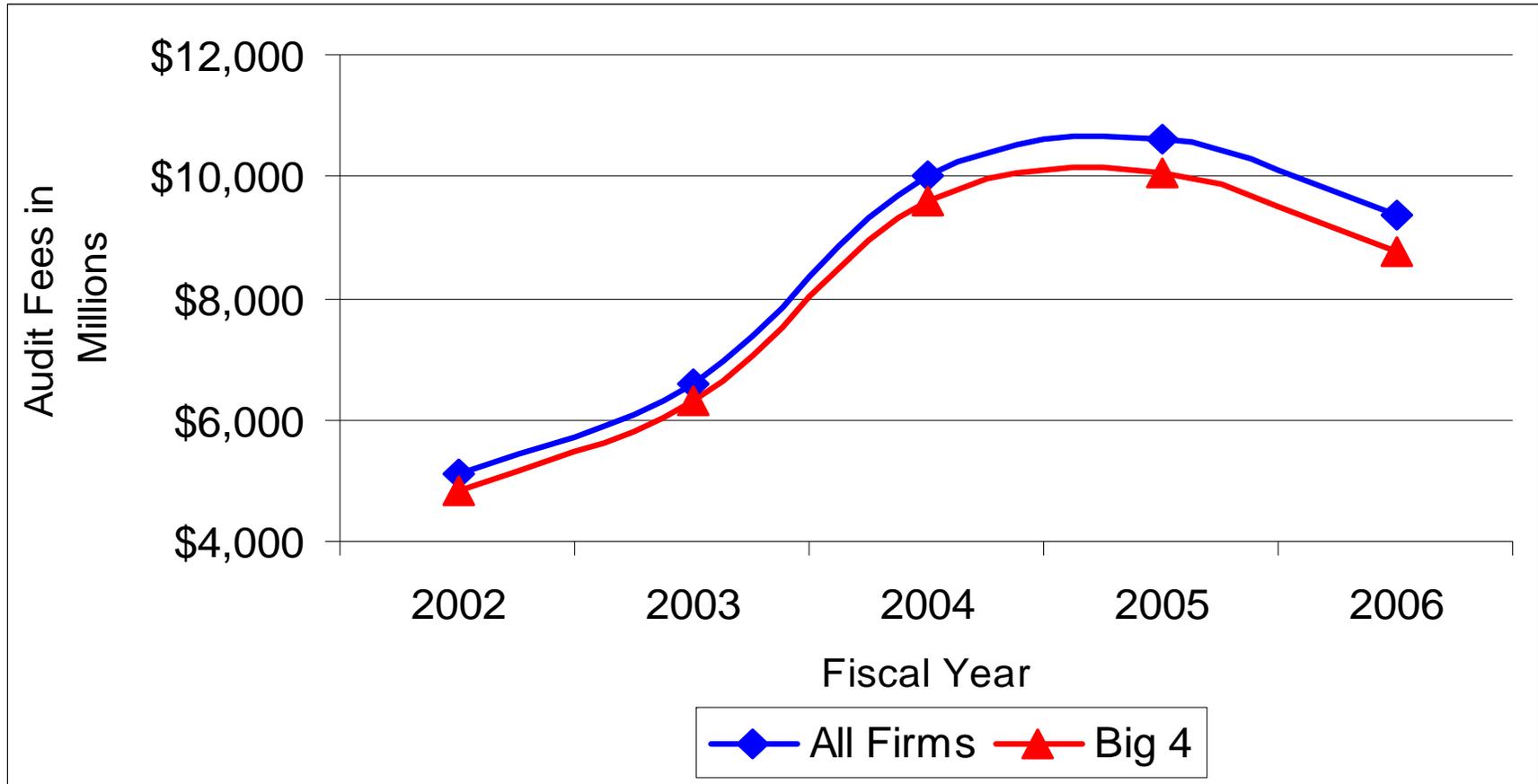
Balsam, and Kim (2004), and Ghosh and Pawlewicz (2008), the coefficient on *Assets* and *Leverage* control variables are positive and statistically significant, which indicates that audit fees increase as client assets and leverage increase. Therefore, I conclude that Big 4 auditors and the largest size clients experience the largest increase in audit fees due to the passing of SOX.

This research paper contains a few inherent limitations and areas for future research. I examine the effect of SOX on audit fees immediately after the passing of the legislation. Therefore, as accounting firms and public clients acclimate to the many SOX requirements, audit fees will inevitable level off. Therefore, the increase in audit fees will not be as significant in future years. Furthermore, although unlikely, it is possible that the data from the *Audit Analytics* database used in this study is not representative of the entire audit fee market. Finally, the drastic increase in audit fees may be attributable to other unknown factors besides SOX. It seems apparent that SOX has many more costs than just an increase in audit fees. Therefore, it would be worthwhile to further research other unknown SOX affects. Finally, additional research in quantifying the benefits of SOX would be very useful in a cost-benefit analysis of the legislation.

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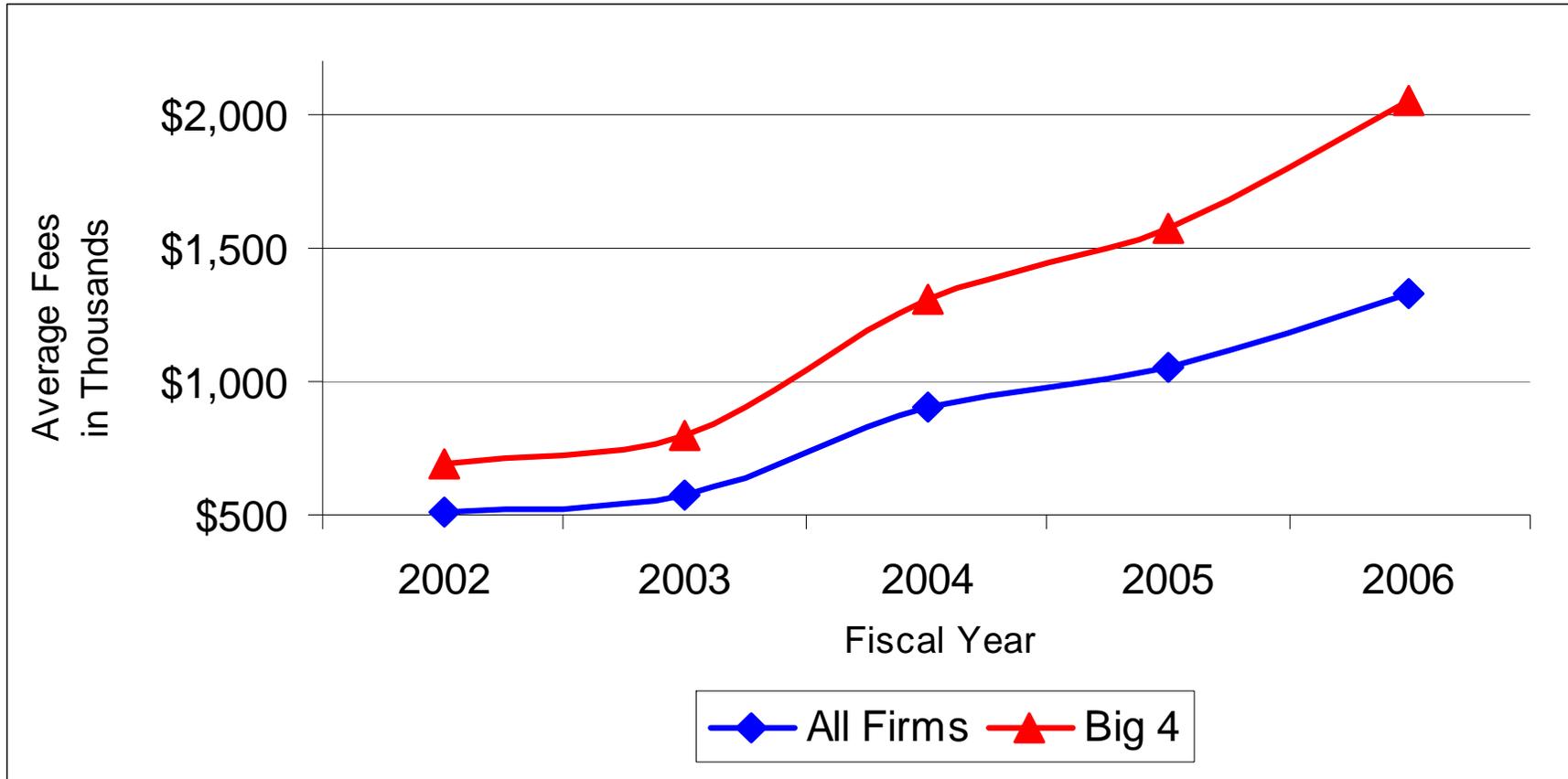
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Figure 1
Total Audit Fees 2002 – 2006



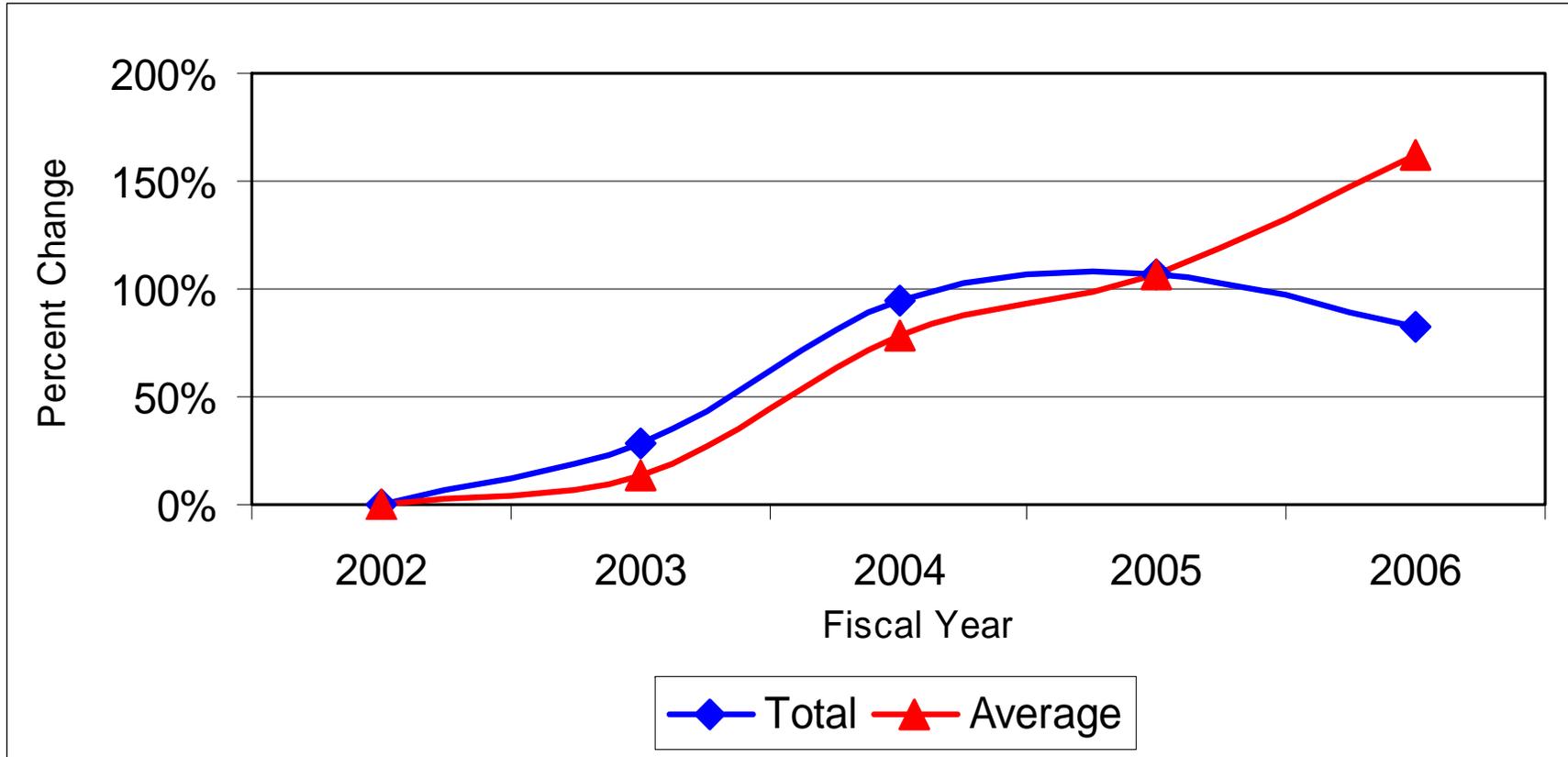
Total audit fees are fees paid to the external auditor for a fiscal year financial statement audit obtained from the Audit Analytics database. All firms include all Big 4 and non Big 4 observations. Big 4 are the four largest public accounting firms in the United States made up of PricewaterhouseCoopers, Ernst & Young, Deloitte, and KPMG.

Figure 2
Average Audit Fees 2002 – 2006



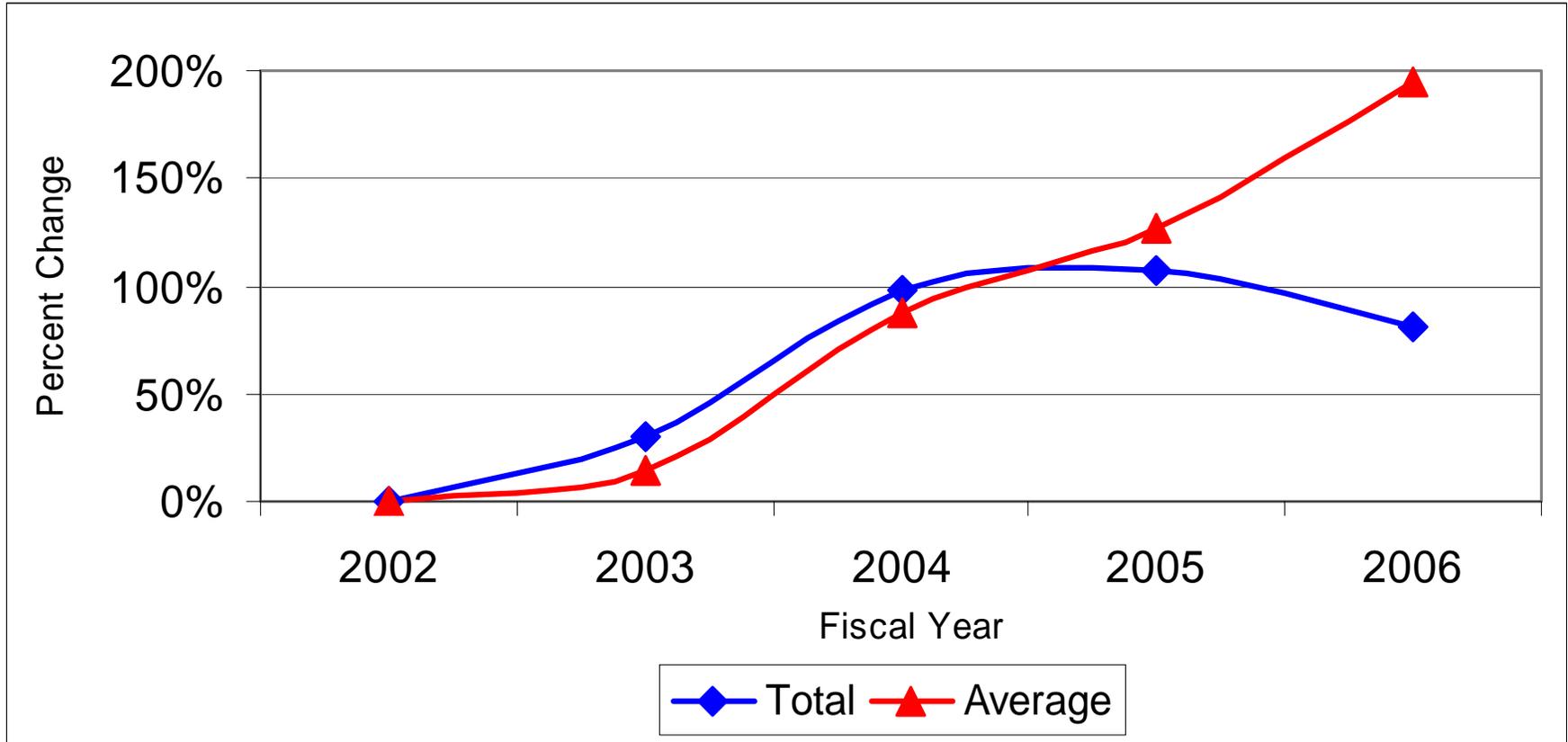
Audit fees are fees paid to the external auditor for a fiscal year financial statement audit. Average audit fees are found by taking total audit fees per year and dividing it by the number of observations per year. Audit fees and number of observations are obtained from the Audit Analytics database. Firms with a zero for audit fees in the database are considered missing, and thus not included in the number of observations per year. All firms include all Big 4 and non Big 4 observations. Big 4 are the four largest public accounting firms in the United States made up of PricewaterhouseCoopers, Ernst & Young, Deloitte, and KPMG.

Figure 3
Cumulative Percent Change of Audit Fees for All Firms 2002 – 2006



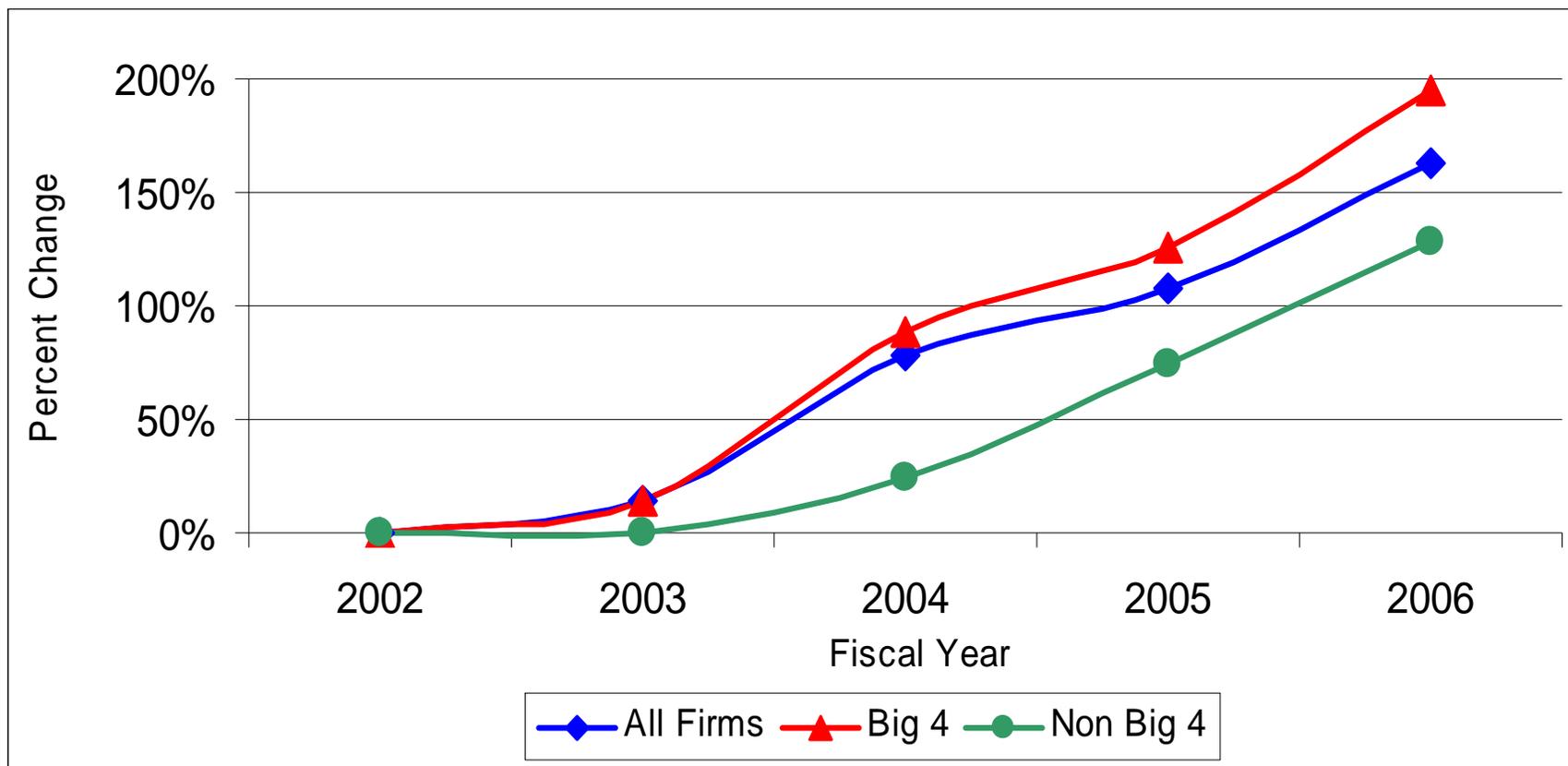
Audit fees are fees paid to the external auditor for a fiscal year financial statement audit. Average audit fees are found by taking total audit fees per year and dividing it by the number of observations per year. Audit fees and number of observations are obtained from the Audit Analytics database. Firms with a zero for audit fees in the database are considered missing, and thus not included in the number of observations per year. All firms include all Big 4 and non Big 4 observations. The cumulative percent change of total and average audit fees is calculated relative to a base year of 2002. Specifically, the cumulative percent change of total audit fees is calculated as follows: $\text{Audit Fees}_t - \text{Audit Fees}_{2002} / \text{Audit Fees}_{2002}$. The cumulative percent change of average audit fees is calculated as follows: $\text{Average Audit Fees}_t - \text{Average Audit Fees}_{2002} / \text{Average Audit Fees}_{2002}$.

Figure 4
Cumulative Percent Change of Audit Fees for Big 4 2002 – 2006



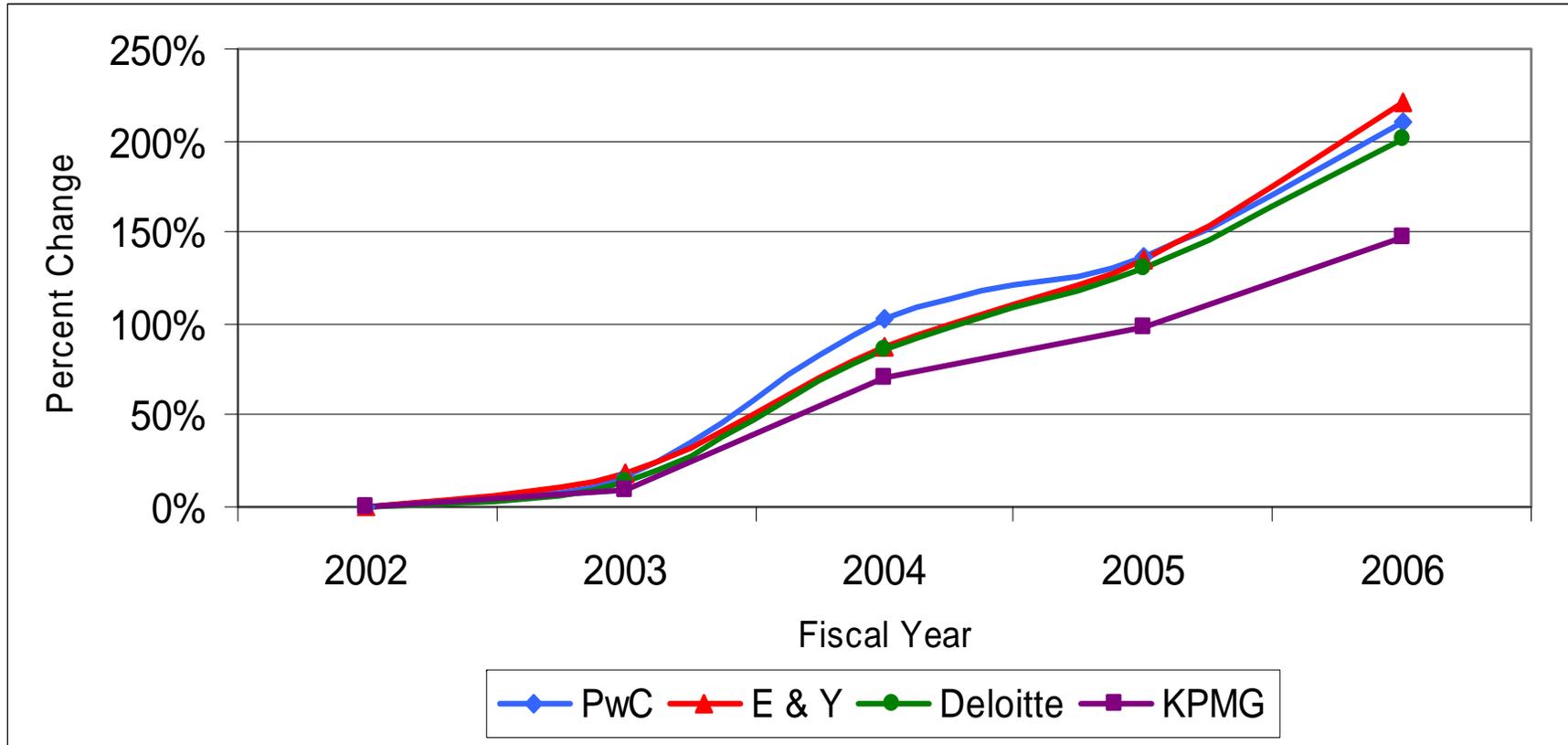
Audit fees are fees paid to the external auditor for a fiscal year financial statement audit. Average audit fees are found by taking total audit fees per year and dividing it by the number of observations per year. Audit fees and number of observations are obtained from the Audit Analytics database. Firms with a zero for audit fees in the database are considered missing, and thus not included in the number of observations per year. Big 4 are the four largest public accounting firms in the United States made up of PricewaterhouseCoopers, Ernst & Young, Deloitte, and KPMG. The cumulative percent change of total and average audit fees is calculated relative to a base year of 2002. Specifically, the cumulative percent change of total audit fees is calculated as follows: $\text{Audit Fees}_t - \text{Audit Fees}_{2002} / \text{Audit Fees}_{2002}$. The cumulative percent change of average audit fees is calculated as follows: $\text{Average Audit Fees}_t - \text{Average Audit Fees}_{2002} / \text{Average Audit Fees}_{2002}$.

Figure 5
Cumulative Percent Change of Average Audit Fees 2002 – 2006



Audit fees are fees paid to the external auditor for a fiscal year financial statement audit. Average audit fees are found by taking total audit fees per year and dividing it by the number of observations per year. Audit fees and number of observations are obtained from the Audit Analytics database. Firms with a zero for audit fees in the database are considered missing, and thus not included in the number of observations per year. All firms include all Big 4 and non Big 4 observations. Big 4 are the four largest public accounting firms in the United States made up of PricewaterhouseCoopers, Ernst & Young, Deloitte, and KPMG. The cumulative percent change of average audit fees is calculated relative to a base year of 2002. Specifically, the cumulative percent change of average audit fees is calculated as follows: $\text{Average Audit Fees}_t - \text{Average Audit Fees}_{2002} / \text{Average Audit Fees}_{2002}$

Figure 6
Cumulative Percent Change of Average Audit Fees of Big 4 2002 – 2006



Audit fees are fees paid to the external auditor for a fiscal year financial statement audit. Average audit fees are found by taking total audit fees per year and dividing it by the number of observations per year. Audit fees and number of observations are obtained from the Audit Analytics database. Firms with a zero for audit fees in the database are considered missing, and thus not included in the number of observations per year. PwC, E & Y, Deloitte, and KPMG refer to the specific public accounting firms that make up the Big 4. PwC is PricewaterhouseCoopers. E & Y is Ernst & Young. The cumulative percent change of average audit fees is calculated relative to a base year of 2002. Specifically, the cumulative percent change of average audit fees is calculated as follows: $\text{Average Audit Fees}_t - \text{Average Audit Fees}_{2002} / \text{Average Audit Fees}_{2002}$

Table 1
Total and Average Audit Fees 2000 - 2006

Fiscal Year	Audit Fees	Average Audit Fees	Number of Observations
Panel A: All Firms			
2000	\$2,184,218,151	\$448,689	4,868
2001	\$2,975,355,901	\$417,652	7,124
2002	\$5,122,298,753	\$508,114	10,081
2003	\$6,610,302,527	\$579,394	11,409
2004	\$9,994,836,395	\$905,001	11,044
2005	\$10,619,422,434	\$1,053,201	10,083
2006	\$9,346,622,024	\$1,333,137	7,011
Panel B: Big 4			
2000	\$1,679,932,885	\$538,440	3,120
2001	\$2,407,584,858	\$527,748	4,562
2002	\$4,840,751,037	\$695,410	6,961
2003	\$6,318,139,836	\$797,443	7,923
2004	\$9,576,307,089	\$1,307,881	7,322
2005	\$10,034,842,800	\$1,573,106	6,379
2006	\$8,784,750,951	\$2,052,992	4,279
Panel C: Non Big 4			
2000	\$504,285,266	\$288,493	1,748
2001	\$567,771,043	\$221,612	2,562
2002	\$281,547,716	\$90,240	3,120
2003	\$292,162,691	\$83,810	3,486
2004	\$418,529,306	\$112,447	3,722
2005	\$584,579,634	\$157,824	3,704
2006	\$561,871,073	\$205,663	2,732

Audit fees are fees paid to the external auditor for a fiscal year financial statement audit. Average audit fees are found by taking total audit fees per year and dividing it by the number of observations per year. Audit fees and number of observations are obtained from the Audit Analytics database. Firms with a zero for audit fees in the database are considered missing, and thus not included in the number of observations per year. All firms include all Big 4 and non Big 4 observations. Big 4 are the four largest public accounting firms in the United States made up of PricewaterhouseCoopers, Ernst & Young, Deloitte, and KPMG. Non Big 4 is any other public accounting firm that is not the Big 4.

Table 2
Cumulative Percent Change of Total and Average Audit Fees 2003 - 2006

Fiscal Year	Total Audit Fees	Average Audit Fees
Panel A: All Firms		
2003	29%	14%
2004	95%	78%
2005	107%	107%
2006	82%	162%
Panel B: Big 4		
2003	31%	15%
2004	98%	88%
2005	107%	126%
2006	81%	195%
Panel C: Non Big 4		
2003	4%	-7%
2004	49%	25%
2005	108%	75%
2006	100%	128%

Total audit fees are fees paid to the external auditor for a fiscal year financial statement audit. Average audit fees are found by taking total audit fees per year and dividing it by the number of observations per year. Audit fees and number of observations are obtained from the Audit Analytics database. Firms with a zero for audit fees in the database are considered missing, and thus not included in the number of observations per year. All firms include all Big 4 and non Big 4 observations. Big 4 are the four largest public accounting firms in the United States made up of PricewaterhouseCoopers, Ernst & Young, Deloitte, and KPMG. Non Big 4 is any other public accounting firm that is not the Big 4. The cumulative percent change of total and average audit fees is calculated relative to a base year of 2002. Specifically, the cumulative percent change of total audit fees is calculated as follows: $\text{Audit Fees}_t - \text{Audit Fees}_{2002} / \text{Audit Fees}_{2002}$. The cumulative percent change of average audit fees is calculated as follows: $\text{Average Audit Fees}_t - \text{Average Audit Fees}_{2002} / \text{Average Audit Fees}_{2002}$.

Table 3
Total and Average Audit Fees 2000 - 2006: Big 4

Fiscal Year	Audit Fees	Average Audit Fees	Number of Observations
Panel A: PwC			
2000	\$587,453,448	\$634,399	926
2001	\$891,310,313	\$669,655	1331
2002	\$1,463,375,680	\$738,333	1982
2003	\$1,926,680,445	\$859,358	2242
2004	\$3,048,261,591	\$1,498,654	2034
2005	\$3,124,421,630	\$1,745,487	1790
2006	\$2,644,017,052	\$2,289,192	1155
Panel B: E & Y			
2000	\$398,370,388	\$441,163	903
2001	\$537,819,776	\$410,236	1311
2002	\$1,146,590,662	\$577,628	1985
2003	\$1,529,530,750	\$684,048	2236
2004	\$2,205,022,295	\$1,084,615	2033
2005	\$2,418,631,433	\$1,356,495	1783
2006	\$2,254,829,896	\$1,849,737	1219
Panel C: Deloitte			
2000	\$345,993,624	\$564,427	613
2001	\$511,389,914	\$547,527	934
2002	\$1,079,592,764	\$732,921	1473
2003	\$1,492,164,610	\$830,364	1797
2004	\$2,321,506,919	\$1,365,592	1700
2005	\$2,532,426,530	\$1,687,160	1501
2006	\$2,117,828,709	\$2,208,372	959
Panel D: KPMG			
2000	\$348,115,425	\$513,445	678
2001	\$467,064,855	\$473,697	986
2002	\$1,151,191,931	\$756,865	1521
2003	\$1,369,764,031	\$831,167	1648
2004	\$2,001,516,284	\$1,287,149	1555
2005	\$1,959,363,207	\$1,501,428	1305
2006	\$1,768,075,294	\$1,869,001	946

Audit fees are fees paid to the external auditor for a fiscal year financial statement audit. Average audit fees are found by taking total audit fees per year and dividing it by the number of observations per year. Audit fees and number of observations are obtained from the Audit Analytics database. Firms with a zero for audit fees in the database are considered missing, and thus not included in the number of observations per year. PwC, E & Y, Deloitte, and KPMG refer to the specific public accounting firms that make up the Big 4. PwC is PricewaterhouseCoopers. E & Y is Ernst & Young.

Table 4
Cumulative Percent Change of Total and Average Audit Fees 2003 - 2006: Big 4

Fiscal Year	Total Audit Fees	Average Audit Fees
Panel A: PwC		
2003	32%	16%
2004	108%	103%
2005	114%	136%
2006	81%	210%
Panel B: E & Y		
2003	33%	18%
2004	92%	88%
2005	111%	135%
2006	97%	220%
Panel C: Deloitte		
2003	38%	13%
2004	115%	86%
2005	135%	130%
2006	96%	201%
Panel D: KPMG		
2003	19%	10%
2004	74%	70%
2005	70%	98%
2006	54%	147%

Total audit fees are fees paid to the external auditor for a fiscal year financial statement audit. Average audit fees are found by taking total audit fees per year and dividing it by the number of observations per year. Audit fees and number of observations are obtained from the Audit Analytics database. Firms with a zero for audit fees in the database are considered missing, and thus not included in the number of observations per year. PwC, E & Y, Deloitte, and KPMG refer to the specific public accounting firms that make up the Big 4. PwC is PricewaterhouseCoopers. E & Y is Ernst & Young. The cumulative percent change of total and average audit fees is calculated relative to a base year of 2002. Specifically, the cumulative percent change of total audit fees is calculated as follows: $\text{Audit Fees}_t - \text{Audit Fees}_{2002} / \text{Audit Fees}_{2002}$. The cumulative percent change of average audit fees is calculated as follows: $\text{Average Audit Fees}_t - \text{Average Audit Fees}_{2002} / \text{Average Audit Fees}_{2002}$.

Table 5
Regression of SOX on Audit Fees

Panel A: Regression 1: $Audit\ Fees = \beta_0 + \beta_1 Sox + \beta_2 Auditor + \beta_3 Assets + \beta_4 Leverage$

Variable	Predicted	Coefficient
<i>Intercept</i>		-446,455 (-12.42)*
<i>Sox</i>	(+)	685,795 (29.35)*
<i>Auditor</i>	(+)	777,754 (29.62)*
<i>Assets</i>	(+)	41.25 (50.46)*
<i>Leverage</i>	(+)	454,822 (10.68)*
<i>Adjusted R²</i>		0.1940
<i>Observations</i>		21,933

Panel B: Regression 2: $Audit\ Fees = \delta_0 + \delta_1 Sox + \delta_2 Sox * Auditor + \delta_3 Auditor + \delta_4 Assets + \delta_5 Leverage$

Variable	Predicted	Coefficient
<i>Intercept</i>		-70,542 (-1.68)
<i>Sox</i>	(+)	31,141 (0.69)
<i>Sox*Auditor</i>	(+)	889,646 (16.9)*
<i>Auditor</i>	(+)	253,646 (6.26)*
<i>Assets</i>	(+)	40.85 (50.28)*
<i>Leverage</i>	(+)	458,338 (10.83)*
<i>Adjusted R²</i>		0.2043
<i>Observations</i>		21,933

Panel C: Regression 3: $Audit\ Fees = \lambda_0 + \lambda_1 Sox + \lambda_2 Sox * Assets + \lambda_3 Auditor + \lambda_4 Assets + \lambda_5 Leverage$

Variable	Predicted	Coefficient
<i>Intercept</i>		-399,805 (-11.11)*
<i>Sox</i>	(+)	604,981 (25.09)*
<i>Sox*Assets</i>	(+)	23.23 (12.87)*
<i>Auditor</i>	(+)	779,364 (29.79)*
<i>Assets</i>	(+)	24.00 (15.30)*
<i>Leverage</i>	(+)	467,610 (11.02)*
<i>Adjusted R²</i>		0.2000
<i>Observations</i>		21,933

Audit fees are the dependent variable, which are fees paid to the external auditor for a fiscal year financial statement audit. *Sox* is a dummy variable that equals one if the fiscal year ends after 2002. *Auditor* is a control dummy variable that equals one when the external auditor is a Big 4 accounting firm consisting of PricewaterhouseCoopers, Ernst & Young, Deloitte, and KPMG, and zero otherwise. *Assets* is a control variable that equals the total assets for a client at the end of the fiscal year. *Leverage* is a control variable that captures the client risk or audit complexity calculated as the proportion of total liabilities to total assets at fiscal year end. T-statistics are presented in parentheses. Significance level of 1% are denoted by *.