The Impact of the Sarbanes-Oxley Act (SOX) on the Cost of Equity Capital of S&P Firms

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This study examines the impact of SOX on the cost of equity capital for small and large S&P firms. The provisions of SOX aim to improve internal control systems and reduce information asymmetry by improving corporate governance systems and increasing transparency. Using a fixed-effects regression model, our findings suggest that the cost of equity capital has decreased post-SOX for the overall sample of firms, but more specifically for the small firms, which are usually associated with poor internal control systems and high information asymmetry. Collectively, our results provide evidence that SOX has had a positive impact on firms.

INTRODUCTION

The Sarbanes-Oxley Act (hereafter, SOX or the Act) has been in effect since July 2002 but its proposed benefits, in light of the exorbitant costs that surrounded its implementation, remain a controversial issue. A 2004 survey conducted by the Financial Executives International (FEI) found that the initial cost of compliance for the largest firms was about $4.6 million. Supporters of the legislation argue that the Act was necessary to prevent the types of financial meltdowns that were witnessed over the 2000-2002 period. However, what remains unclear is whether SOX is actually having a positive impact on public firms given the recent global financial meltdown. In this paper, the impact of the adoption of SOX on the cost of equity capital is empirically investigated. This must be of particular interest and importance to corporate insiders, investors, and indeed all market players as the cost of equity represents the compensation the market demands for owning a stock and assuming the risk of ownership. It is essential to establishing the hurdle rate for a firm's investment projects, which in turn affects the firm's profitability. Also, management uses the cost of equity capital in trying to determine a firm's optimal capital structure, which remains one of the primary determinants of the health and success of any firm.

Easley and O'Hara (2004) show that the quality of information, as well as a firm's information structure, has an effect on its cost of equity capital. The authors report that investors require a higher return to acquire stocks of firms with more private information. This means that the better the information environment, the lower the information asymmetry, and the lower the return demanded by investors because stocks will be viewed as being less risky. Therefore, to the extent that the emphasis of SOX is on improved corporate governance systems, transparency, and information quality (including the accurate

dissemination of information), the effect of the Act on the cost of equity capital is pertinent and warrants investigation.

Merton (1987) puts forth the investor recognition hypothesis. In essence, this hypothesis states that firms that receive minimal publicity and are not covered by many security analysts have a higher cost of capital. According to Merton's hypothesis, it is expected that large firms would have a lower cost of equity capital because these firms are usually well known and garner more media attention. On the other hand, because small firms are less publicized and are usually characterized by high levels of information asymmetry, it is expected that these firms would be subjected to a higher cost of equity capital. Therefore, the impact of SOX on the cost of equity capital of small firms must also be an important consideration, especially if the benefits of SOX to the financial markets as a whole are to be adequately assessed. To our knowledge, we are the first to address this issue.

The main provisions of SOX deal with internal control, financial reporting, board and auditor independence, and insider trading. Essentially, they deal with virtually every single aspect of a firm's governance and operations that has a financial outcome. To the extent that corporate insiders and firms that are found to be non compliant with the mandates of SOX face severe financial penalties and/or imprisonment, it can be assumed that the risk associated with disclosing inaccurate information and fraudulent behavior by firms has increased significantly post-SOX. However, scholars and practitioners are still trying to assess whether the provisions of SOX are having the desired effect on investors, corporate insiders, and the operations of public firms.

This study examines the impact of SOX on the cost of equity capital. Specifically, the following question is investigated: How has the cost of equity capital of firms changed since the implementation of the Act? Given that the cost of equity capital is fundamental to many corporate decisions, and is in part related to the very objectives that SOX is intended to achieve (e.g., improved information quality and transparency of firms' operations), this research makes an important contribution to the entire body of work dealing with corporate governance, corporate disclosure, information quality, and the effect on the cost of equity capital. Our study also contributes to the literature that examines how government intervention via legislation affects various aspects of the financial markets.

In this research, we use the most recent and widespread piece of legislation (SOX) to examine the effect on firms' cost of equity capital, and find that there has been a reduction in the cost of equity capital, specifically in our sample of small firms.

PREVIOUS RESEARCH

Given the importance of the cost of equity capital in the decision-making activities of firms, an extensive line of research has developed over the years dealing with information, corporate disclosure, internal control systems and the cost of equity capital.

Diamond (1985) investigates the optimal release of information by firms. Using a general equilibrium model with endogenous information collection, the author shows that the release of information by firms is advantageous to shareholders. He states, "The welfare improvement occurs because of explicit information cost savings and improved risk sharing." This supports the notion that more information is actually better than less information because of reduced information asymmetry and subsequently, reduced risk. Moreover, this leads to a lower cost of equity capital for firms.

Diamond and Verrecchia (1991) investigate the effect of corporate disclosure on liquidity and the cost of capital. The authors conjecture that under certain conditions reducing information asymmetry reduces the cost of capital. Their findings suggest that by increasing public information (corporate disclosure), there is a reduction in the level of information asymmetry, which in turn leads to a reduction in the cost of capital. They also conclude that corporate disclosure "reduces the risk-bearing capacity available through market makers."

Botosan (1997) investigates the effect of the corporate disclosure level on the cost of equity capital by regressing firm-specific estimates of cost of equity capital on firm size, market beta, and a self-constructed measure of disclosure level. The author reports that for firms characterized by low analyst

following, increased disclosure leads to a lower cost of equity capital. However, for firms with a high level of security analyst following, the author finds no relationship between the disclosure level and the cost of equity capital. The author attributes this to her measure of disclosure, which she acknowledges may not be a powerful proxy for overall corporate disclosure especially when security analysts have a major role in the communication process.

Healy, Hutton and Palepu (1999) examine stock performance and intermediation changes surrounding increases in corporate disclosure. Their findings indicate that increased voluntary corporate disclosure is associated with better stock performance, increased analyst following, a higher level of institutional ownership, and higher liquidity. In addition, the authors surmise that increases in corporate disclosure correspond to the increased use of debt and equity financing.

Leuz and Verrecchia (2000), in exploring the economic consequences of increased corporate disclosure, surmise that a firm's commitment to greater disclosure should lower the cost of capital that results from information asymmetries. The authors note that greater corporate disclosure can mean an increase in the quantity of disclosure as well as an increase in the quality of disclosure, or both. A commitment by corporate insiders to increase the disclosure level is reflected in a reduced level of information asymmetry between firms and their shareholders, or among buyers and sellers of the firm's stock. Moreover, the upside is an increase in liquidity, a lesser discount at which the stock is sold, and a lower cost of equity capital. Using a cross-sectional analysis, they find that greater disclosure levels lead to benefits that are economically and statistically significant.

Botosan and Plumlee (2002) investigate the relationship between the expected cost of equity capital and three types of corporate disclosure – annual report, quarterly and other published reports, and investor relations. The authors find a negative association between the cost of equity capital and the annual report disclosure level. They find no relationship between the cost of equity capital and investor relations activities. However, they find a positive relationship between the cost of equity capital and the quarterly report disclosure level. According to the authors, while this result may be contrary to what the theory predicts, it supports managers' claims that more timely disclosure increases the cost of capital because of greater stock price volatility.

Gomes, Gorton and Madureira (2007) investigate Regulation Fair Disclosure (Reg FD) and its impact on information and the cost of capital. They find that the implementation of Reg FD affected normal channels of information, making them more complicated, which in turn adversely affected the cost of equity capital. Interestingly, they find that small firms are more affected than large firms because security analysts stop following these small firms, leading to an increase in their cost of equity capital.

Ogneva, Subramanyam and Raghunandan (2007) examine the relationship between the cost of equity capital and internal control weaknesses (ICW) using a sample of firms that files first-time Section 404 reports with the SEC. They find a higher implied cost of equity associated with ICW firms than for a control sample of firms that did not disclose any ICW. The authors conclude that, on average, ICWs are not directly associated with a higher cost of equity capital.

Zhang (2007) finds that SOX has had a negative impact on firm value. Conversely, Li, Pincus and Rego (2008) and Jain and Rezaee (2006) document a positive effect of SOX on firm value. If the objectives of SOX are being achieved and the legislation is having a positive impact on firm value, financial markets are enjoying less information asymmetry, and investors are facing less risk as a result, it is reasonable to hypothesize a decrease in the cost of equity capital.

The special case of small firms in relation to SOX has been previously documented. Poor internal control systems and a high level of information asymmetry usually characterize small firms, and they normally attract less security analysts as well as less publicity. Doyle, Ge and McVay (2007) point out that increased transparency can be especially beneficial to small firms that are not normally subjected to close monitoring. Therefore, if SOX is having a positive influence on these small firms, it will be reflected in a decrease in the risk normally associated with ineffective internal control systems and a poor information environment. Subsequently, these small firms should enjoy a reduction in the cost of equity capital.

Ashbaugh-Skaife, et. al., (2009) examine the effect of SOX internal control deficiencies on the risk of the firm and cost of equity. They find that firms with internal control deficiencies have significantly higher idiosyncratic risk, systematic risk and cost of equity. The authors also find that any changes in the internal control effectiveness of a firm lead to significant changes in the cost of equity ranging from 50 to 150 basis points. As a result of these findings, they conclude that internal control reports have a direct impact on investors' risk analyses and firms' cost of equity capital.

HYPOTHESES

For examining the effect of the Sarbanes-Oxley Act on the cost of equity capital in both large and small firms, we test the following two hypotheses:

H1: The cost of equity capital is lower post-SOX.
H2: Changes in the cost of equity capital are more significant for small firms.

RESEARCH METHOD

Data Description and Sample Selection

The data for our study come from multiple sources. Specifically, earnings forecast data are obtained from I/B/E/S, stock price data are obtained from CRSP, company financial data come from COMPUSTAT, and the macro-economic data come from the Federal Reserve Bank of St. Louis. The sample of firms comes from the S&P 500 Index and the S&P Small Cap 600 Index, and includes only those firms that have a December fiscal year end. Firms with missing data from the three databases were dropped from the sample. Also, firms with an analyst following of less than 2 were dropped from the sample since it would not be possible to calculate the dispersion. The time period under review is from January 1996 to December 2006. The pre-SOX period includes the years1996-2002, while the post-SOX period includes the years 2003 to 2006. This time period is chosen in order to minimize the sensitivity of the results to other macro-economic shocks in the economy, especially the most recent financial crisis which experts believe began in 2007.

The final sample consists of 4,642 observations, representing 422 firms. Of these firms, 230 are from the S&P 500 Index and 192 are from the S&P Small Cap Index. Approximately 37 percent of the observations are during the post-SOX period, and 46 percent of the observations represent small firms. The specific number of observations in each test may be lower depending on the omission of outliers and the cost of equity capital measure used.

In estimating the cost of equity capital, many different methods were considered. Previous studies (Gebhardt, et. al., (2001)) have used average realized returns to estimate the cost of equity capital even though expected returns may be the more appropriate measure. This is because expected returns are not directly observable. In defense of the widespread use of average realized returns, Gebhardt, et. al., (2001) state, "…in an efficient market where risk is appropriately priced, the average ex post realized returns should be an unbiased estimator of the unobservable ex ante expected returns." Fama and French (1997) used the CAPM and a three-factor model to estimate the cost of equity capital, but found that the estimates were not precise. In fact, other estimates of the cost of equity capital, including earnings to price ratio (E/P), Gordon Growth Model, and average return on equity (ROE), all have disadvantages and imperfections (Botosan, 1997).

Against this backdrop, the literature has moved to using the positive earnings growth (PEG) ratio as a proxy for the cost of equity capital. The PEG ratio is defined as the price-earnings (PE) ratio divided by the short-term earnings growth rate. Easton (2004) surmises that the main advantage of using the PEG ratio is that it considers differences in short-run growth, thereby producing a better ranking than simply the PE ratio. The author further acknowledges that the use of the PEG ratio provides a more parsimonious method of ranking firms even though expected rates of return estimates based on the PEG ratio are biased downward. Also, Botosan and Plumlee (2005) examine the reliability of five popular methods to

estimating the risk premium, and find that the PEG ratio estimates are robust and consistently related to market risk, leverage risk, information risk, residual risk and growth. Following Botosan and Plumlee (2005), we estimate the cost of equity capital in our study using the PEG ratio as shown in Figure 1 below:

FIGURE 1
ESTIMATION OF THE COST OF CAPITAL EQUATION

$$\text{PEG Ratio } (R_{it}) = (P_0/eps_1) / ((100*(eps_2 - eps_1)/ eps_1))$$

NOTE: P_0 = stock price
eps_t = earnings per share
P_0/eps_1 = PE ratio

Consistent with Gebhardt, et. al., (2001), we use risk and firm characteristics in the panel regression analysis. For each firm, the standard deviation of returns is calculated from the previous year's monthly returns (from CRSP) providing a measure of the market volatility. Firm size is measured as the natural log of the market value of equity, according to Ashbaugh-Skaife, et. al., (2009). Firm size, along with the number of security analysts following a firm are used to proxy for the information environment and liquidity. The rationale is that the information environment is more efficient for larger firms than for smaller firms, and also, larger firms are normally characterized by more liquidity than smaller firms (Leuz and Verrecchia, 2000); (Easley and O'Hara, 2004). In terms of earnings variability, and consistent with Fama and French (1993), forecast error, dispersion of analysts' forecasts, and earnings volatility are all used to capture risk in the model.

Methodology

Gebhardt, et. al., (2001) highlight many factors that can have an impact on the cost of equity capital. In our study, however, the primary concern is in investigating the impact of SOX on the cost of equity capital. Since panel data is being used, a model with firm fixed effects is employed to isolate the effect of SOX on the cost of equity capital, while controlling for the firm characteristics discussed above. This model is appropriate because the variables are homogenous across the firms, and the firms are fixed throughout the entire sample period. In order to get the most efficient estimates, robust *t*-statistics from a heteroskedasticity-autocorrelation consistent estimator are reported. We estimate the fixed-effects regression in Figure 2.

FIGURE 2
FIXED EFFECTS REGRESSION EQUATION

$$PEG_{it} = a_0 + a_1 (SOX_t) + a_2 (\text{Debt Ratio}_{it}) + a_3 \ln (NAN_{it}) + a_4 (ANFE_{it}) + a_5 \ln (Disp_{it}) + a_6 \ln (Evol_{it}) + a_7 \ln (\text{Ret Vol}_{it}) + a_8 \ln (\text{BE/ME Ratio}_{it}) + a_9 \ln (\text{Firm Size}_{it}) + a_{10} \ln (GDP_{it}) + a_{11} \ln (CPI_{it}) + a_{12} \ln (PPI_{it}) + a_{13} \ln (RETAIL_{it}) + u_{it}$$

SOX is a dummy variable that equals one for the post-SOX period, and zero otherwise. Given that the SOX dummy variable could reflect alternative constructs other than 'how SOX affected firms', we introduce into the model macroeconomic control variables that are unrelated to SOX, which may have an impact on the cost of equity capital. These variables include gross domestic product (GDP), consumer price index (CPI), producer price index (PPI) and real retail and food services sales (RETAIL).

The debt ratio (Debt Ratio$_{it}$) is calculated as long-term debt divided by the year-end total common equity and is used to proxy for financial leverage. Modigliani and Miller (1958) document a positive relationship between the debt ratio and cost of equity capital. Thus, we expect a positive sign on the coefficient of the debt ratio. Security analyst following, ln (NAN_{it}), is equal to the number of analysts making a forecast for each firm. A negative sign is expected on this variable as previous research has shown that more security analyst coverage is associated with a lower cost of capital (Gomes et al., 2007).

The absolute normalized forecast error ($ANFE_{it}$) is measured as the absolute value of the difference between the consensus forecast earnings per share (EPS) for firm *i* for year *t* and the actual EPS for firm *i* for quarter *t*, divided by the absolute value of the actual EPS. Dispersion of security analysts' forecasts, ln ($Disp_{it}$), is equal to the natural log of the coefficient of variation of the consensus forecasts (i.e., the standard deviation of the consensus forecast earnings over the year normalized by the mean consensus forecast). Earnings volatility, ln ($Evol_{it}$), is equal to the natural log of the coefficient of variation of annual pre-tax income over the past two years (i.e., the standard deviation of the pre-tax income over the past two years divided by the mean). The return volatility, ln ($Ret\ Vol_{it}$), is calculated as the natural log of the standard deviation of the previous year's monthly returns. Following Fama and French (1995), the book to market ratio, ln ($BE/ME\ Ratio_{it}$), is calculated as the natural log of the book value of equity divided by the market value of equity and is used as a proxy for risk. A positive association is expected between the cost of equity capital and the forecast error, dispersion, earnings volatility and the book to market ratio.

In order to examine the impact of SOX on large and small firms, the sample is categorized into firm size quartiles with quartile 1 representing the smallest firms and quartile 4 representing the largest firms, based on the market value of equity of each firm at the end of the first year of the sample period. Consistent with previous research (e.g., Brennan, et. al., 1993), it is expected that smaller firms with less security analyst following will have a higher cost of equity capital.

Table 1 summarizes the descriptive statistics separately for the overall sample and for the four size groups. Panel A displays descriptive statistics for the overall sample, while Panels B and C display descriptive statistics for the size groups. For each variable, the mean, median and standard deviation (SD) are reported. Panel A shows that the average cost of equity capital (PEG) for the entire sample is 7%. As expected, in Panels B and C, we note that for the smallest firm size quartile (Q1), the average cost of equity capital is 10%, while for the largest firm size quartile (Q4), the average cost of equity capital is 6%. In terms of security analyst coverage, the mean number of analysts for the smallest firms is 5.29 while for the largest firms, the mean number of analysts is 20.47. These findings are consistent with Brennan, et. al., (1993), Brenann, et. al., (1998), and Gebhardt, et. al., (2001) who found that smaller firms with less security analyst following have a higher cost of equity capital.

TABLE 1
DESCRIPTIVE STATISTICS (1996-2006)

Panel A: All Firms

Variable	Mean	Median	SD
Cost of capital (PEG)	0.07	0.03	0.13
SOX	0.36	0	0.48
Debt Ratio	0.57	0.45	0.50
Analysts (NAN)	12.46	11.00	8.15
Forecast Error (ANFE)	0.13	0.05	0.16
Dispersion	-3.15	-3.52	1.42
Earnings Volatility	-1.09	-1.09	0.97
Return Volatility	-0.03	0.07	0.99
BE/ME Ratio	0.42	0.39	0.22
Firm Size	8.02	7.97	1.48
GDP	9.19	9.20	0.09
CPI	5.17	5.18	0.08
PPI	4.92	4.89	0.09
RETAIL	11.97	11.98	0.08

Panel B: Firms by Size (Quartiles 1 and 2)

Variable	Mean		Median		SD	
	Q1	Q2	Q1	Q2	Q1	Q2
Cost of capital (PEG)	**0.10**	**0.07**	**0.04**	**0.03**	0.18	0.11
Debt Ratio	**0.54**	**0.52**	**0.38**	**0.42**	0.52	0.46
Analysts (NAN)	**5.29**	**9.41**	**4.00**	**8.00**	3.32	5.28
Forecast Error (ANFE)	**0.19**	**0.13**	**0.10**	**0.06**	0.19	0.15
Dispersion	**-2.39**	**-3.09**	**-2.77**	**-3.42**	1.56	1.38
Earnings Volatility	**-0.72**	**-1.08**	**-0.66**	**-1.15**	0.92	0.97
Return Volatility	**-0.47**	**-0.04**	**-0.46**	**0.06**	0.92	0.93
BE/ME Ratio	**0.56**	**0.44**	**0.58**	**0.41**	0.22	0.21
Firm Size	**6.12**	**7.35**	**5.99**	**7.37**	0.28	0.37
GDP	**9.16**	**9.20**	**9.19**	**9.22**	0.09	0.09
CPI	**5.15**	**5.18**	**5.15**	**5.19**	0.07	0.08
PPI	**4.89**	**4.93**	**4.88**	**4.89**	0.07	0.09
RETAIL	**11.95**	**11.98**	**11.98**	**11.99**	0.07	0.07

Panel C: Firms by Size (Quartiles 3 and 4)

Variable	Mean		Median		SD	
	Q3	Q4	Q3	Q4	Q3	Q4
Cost of capital (PEG)	**0.07**	**0.06**	**0.03**	**0.03**	0.12	0.10
Debt Ratio	**0.60**	**0.63**	**0.49**	**0.48**	0.47	0.51
Analysts (NAN)	**14.46**	**20.47**	**14.00**	**19.00**	6.00	7.78
Forecast Error (ANFE)	**0.10**	**0.08**	**0.04**	**0.03**	0.14	0.13
Dispersion	**-3.40**	**-3.70**	**-3.69**	**-3.98**	1.24	1.12
Earnings Volatility	**-1.15**	**-1.33**	**-1.12**	**-1.34**	0.99	0.91
Return Volatility	**0.10**	**0.27**	**0.26**	**0.46**	0.96	0.99
BE/ME Ratio	**0.40**	**0.30**	**0.37**	**0.25**	0.20	0.17
Firm Size	**8.64**	**9.98**	**8.67**	**10.07**	0.39	0.40
GDP	**9.19**	**9.21**	**9.20**	**9.22**	0.09	0.09
CPI	**5.17**	**5.19**	**5.18**	**5.19**	0.08	0.08
PPI	**4.92**	**4.93**	**4.89**	**4.90**	0.09	0.10
RETAIL	**11.97**	**11.98**	**11.98**	**11.99**	0.08	0.08

NOTE: Bold text in panels B and C indicates that the firms in quartiles 1 and 2 (small firms) are significantly different from the firms in quartiles 3 and 4 (large firms) at $p = 0.05$ (two-tailed). Differences in means and medians are examined using a Wilcoxon rank-sum *t*-test.

EMPIRICAL RESULTS

Cost of Equity Capital Post-SOX

Table 2 presents the results on the impact of SOX on cost of equity capital for the overall sample. It is hypothesized that cost of equity capital has decreased post-SOX. This hypothesis is motivated by the

mandates of the Act, which require that public firms increase the transparency and accuracy of all of their financial operations, improve their internal control systems as well as their corporate governance systems. If the legislation is having the desired effect, and the information environment as well as investor confidence have improved, public firms will be viewed as being less risky which will subsequently impact the cost of equity capital.

Table 2 (Panel A) shows a negative and statistically significant relationship between the cost of equity capital and SOX in the absence of the macroeconomic control variables (*t-statistic* = -2.76). When the macroeconomic control variables are introduced in the model, the results confirm the negative and statistically significant relationship between the cost of equity capital and SOX (*t-statistic* = -2.64). This means that the cost of equity capital has decreased post-SOX providing support for the notion that the implementation of SOX has been beneficial to public firms. These findings are also consistent with the research of Ashbaugh-Skaife, et. al., (2009) who find that firms with less internal control deficiencies have a lower cost of equity capital. Given that one of the primary objectives of SOX is to improve firms' internal control systems, our results point to a possible achievement of that objective. Also consistent with prior studies (Brennan, et. al., 1998), the findings show a negative and significant association between the number of security analysts, firm size and the cost of equity capital.

TABLE 2
REGRESSION OF THE COST OF EQUITY CAPITAL

Panel A: Model without macroeconomic variables.

Variable	**Coefficient**	***t*-Statistics**
SOX	**-0.019**	**-2.76*** **
Debt Ratio	-0.003	-0.20
Analysts (LNAN)	0.006	0.55
Forecast Error (ANFE)	0.017	0.49
Dispersion	-0.004	-1.66*
Earnings Volatility	0.005	0.97
Return Volatility	-0.005	1.53
BE/ME Ratio	0.051	3.41***
Firm Size	-0.028	2.59***
Constant	0.345	4.02***
Adjusted R^2	0.05	

Panel B: Model with the macroeconomic variables.

Variable	**Coefficient**	***t*-Statistics**
SOX	**-0.033**	**-2.64*** **
Debt Ratio	0.006	0.36
Analysts (LNAN)	-0.001	-0.11
Forecast Error (ANFE)	0.028	0.84
Dispersion	-0.004	-1.97**
Earnings Volatility	0.005	0.96

Return Volatility	-0.005	1.59
BE/ME Ratio	0.064	4.18***
Firm Size	-0.020	-1.92*
GDP	1.777	1.57
CPI	-0.794	-1.56
PPI	0.428	3.36***
Retail	-1.755	-1.89*
Constant	6.982	2.53**
Adjusted R^2	0.07	

*** Denotes statistical significance at the 1% level in two-tailed tests.
** Denotes statistical significance at the 5% level in two-tailed tests.
* Denotes statistical significance at the 10% level in two-tailed tests.

Cost of Equity Capital Post-SOX by Firm Size

Table 3 presents the results on the effect of SOX on the cost of equity capital by firm size. Quartile 1 represents the smallest firms while quartile 4 represents the largest firms. The hypothesis is that the effect of SOX on the cost of equity capital post-SOX for small firms will be more significant than the effect on large firms. Panel A displays the results for quartile 1, which represents the smallest firms based on the market value of equity. A negative and significant sign on the SOX dummy variable provides evidence that the cost of equity capital for small firms have decreased post-SOX (*t-statistic* = -1.73). The results lend empirical support to the view that there has indeed been an improvement in the overall operations of firms post-SOX. This is being reflected in a decrease in the perceived riskiness of the smallest public firms and in turn, a decrease in the cost of equity capital. Panel B presents the results for quartile 2. The results are consistent with the findings in quartile 1, as well as with the findings in the overall sample. For this group of firms, the cost of equity capital has decreased post-SOX (*t-statistic* = -1.78).

The results for quartile 3 and 4, which represent the larger firms are presented in Panels C and D. Interestingly, the negative relationship between the implementation of SOX and the cost of equity capital is not significant in these groups of larger firms (*t-statistic* = -0.14 and -1.46, respectively). We conclude that the reduction in the cost of equity capital post-SOX differs across the quartiles, with the statistically significant results being found in the sample of smaller firms. These results are not surprising for the following reasons: As one would expect, the internal control systems, financial operations, and the information environment of the largest firms were already very efficient before SOX was implemented. In addition, one would associate less information asymmetry with the largest firms. Therefore, we can surmise that any decrease in the cost of equity capital post-SOX for these large firms are not as significant as the reductions in the cost of equity capital for the smaller firms in quartiles 1 and 2. These small firms may have benefitted more from the provisions of SOX in terms of less systematic risk, firm-specific risk, information asymmetry, and improved internal control systems.

TABLE 3
REGRESSIONS OF THE COST OF EQUITY CAPITAL BY FIRM SIZE

Panel A: Quartile 1; N = 367

Variable	**Coefficient**	***t*-Statistics**
SOX	**-0.0655**	**-1.73***
Debt Ratio	-0.023	-0.61
Analysts (LNAN)	-0.002	-0.06

Forecast Error (ANFE)	0.145	1.47
Dispersion	-0.012	-1.68*
Earnings Volatility	-0.037	-1.66*
Return Volatility	-0.006	-0.53
BE/ME Ratio	0.125	2.31**
Firm Size	0.034	0.46
GDP	4.037	1.08
CPI	-2.184	-1.02
PPI	1.104	1.85*
Retail	-3.583	-1.28
Constant	11.579	1.46
Adjusted R^2	0.08	

Panel B: Quartile 2; N = 529

Variable	**Coefficient**	***t*-Statistics**
SOX	**-0.029**	**-1.78***
Debt Ratio	0.012	0.78
Analysts (LNAN)	0.002	0.15
Forecast Error (ANFE)	-0.005	-0.08
Dispersion	-0.007	-1.88*
Earnings Volatility	0.008	0.64
Return Volatility	-0.008	-1.39
BE/ME Ratio	0.048	2.01**
Firm Size	-0.012	-0.39
GDP	0.392	0.34
CPI	-0.197	-0.38
PPI	0.405	2.21**
Retail	-0.566	-0.51
Constant	2.259	0.59
Adjusted R^2	0.06	

Panel C: Quartile 3; N = 538

Variable	**Coefficient**	***t*-Statistics**
SOX	**-0.003**	**-0.14**
Debt Ratio	-0.014	-0.57
Analysts (LNAN)	-0.009	-0.35
Forecast Error (ANFE)	0.117	1.30

Dispersion	-0.008	-1.38
Earnings Volatility	0.013	1.73*
Return Volatility	-0.003	-0.45
BE/ME Ratio	0.074	2.68***
Firm Size	-0.012	-0.39
GDP	2.386	1.21
CPI	-0.936	-1.04
PPI	0.125	0.55
Retail	-2.200	-1.36
Constant	8.894	1.85*
Adjusted R^2	0.08	

Panel D: Quartile 4; N = 672

Variable	**Coefficient**	***t*-Statistics**
SOX	**-0.033**	**-1.46**
Debt Ratio	0.024	0.67
Analysts (LNAN)	0.010	0.38
Forecast Error (ANFE)	0.033	0.64
Dispersion	0.000	0.05
Earnings Volatility	0.010	2.01**
Return Volatility	-0.004	-0.71
BE/ME Ratio	0.053	2.25**
Firm Size	-0.055	-2.98***
GDP	-0.117	-0.11
CPI	0.015	0.02
PPI	0.274	1.60
Retail	-0.190	-0.22
Constant	2.602	0.89
Adjusted R^2	0.07	

*** Denotes statistical significance at the 1% level in two-tailed tests.
** Denotes statistical significance at the 5% level in two-tailed tests.
* Denotes statistical significance at the 10% level in two-tailed tests.

CONCLUSIONS

Investors, and other proponents of the Act, stress the point that SOX's main goal of improving the accuracy and quality of financial reporting benefits internal control systems, the information environment, corporate governance and management. This, in turn, leads to more investor confidence and efficient capital markets. In a further defense of SOX, they point out that misconduct by insiders should be reduced

because of increased transparency, leading to growth, wise risk-taking, increased confidence in the capitalist system, higher rates of investment and economic progress.

The effect of SOX on the cost of equity capital is a matter of considerable importance and interest to corporate insiders, investors, security analysts, and indeed all market participants. The benefits and costs of the Act are still being heavily debated primarily because they have not been properly established and quantified. Our paper presents empirical evidence of the effect of SOX on the cost of equity capital. For a sample of 422 firms, the findings suggest that the cost of equity capital has decreased post-SOX for the overall sample. However, when small and large firms are examined separately, the results only hold for the sample of smaller firms. The reduction in the cost of equity capital disappears for the larger firms.

Our study sheds some light on the ongoing debate about the impact of SOX on the welfare of small firms. Opponents of SOX believe that the costs of compliance are too burdensome for these small firms to realize any benefits. Proponents, on the other hand, hold the view that SOX will improve the efficiency of these small firms. The findings presented here give credence to the view that SOX has had a positive impact on small firms. The decrease in the cost of equity capital experienced by the sample of small firms points to a reduction in the overall riskiness of these small firms, and supports the notion that small firms do indeed stand to benefit from the provisions of SOX.

Further, the evidence presented here indicates that smaller firms that initially are characterized by poor internal control systems and low disclosure levels (high information asymmetry) experience a decrease in their cost of equity capital after the implementation of SOX. This reduction in the cost of equity capital is not seen in larger firms that traditionally enjoy good internal control systems and low information asymmetry. We, therefore, surmise that for small firms, SOX has been effective in decreasing the information risk to investors and has led to a lower cost of equity capital.

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