Managerial Compensation Incentives and Corporate Debt Maturity: Evidence from FAS 123R*

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ABSTRACT

This paper studies the effect of risk-taking incentives provided in managerial compensation on corporate debt maturity choices. The Financial Accounting Standard (FAS) 123R is used as a quasi-natural experiment to establish causality. FAS 123R requires firms to expense stock options at fair value, which has resulted in a dramatic reduction in both option compensation and managerial risk-taking incentives. We find that treated firms significantly increased debt maturity relative to control firms. Further tests identify that the alleviation of creditor-shareholder agency conflicts due to the adoption of FAS 123R is the underlying mechanism driving the result.

Keywords: Debt Maturity, CEO Compensation, FAS 123R, Credit-Shareholder Conflict

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1. Introduction

This paper studies the relationship between managerial compensation incentives and corporate debt maturity choices. The public debate on the risks related to short-term debt, ignited by the failure of Bear Stearns and Lehman Brothers in the 2008-2009 financial crisis, as well as the prevalence of option compensation before the crisis, reflect the importance of this study. There are two ways that managerial compensation incentives can affect corporate debt maturity choices. First, equity-based compensation, especially stock options (Jensen and Meckling, 1976; John and John, 1993), induces risk-taking behavior among top managers with its convex payoff structure. By shifting into riskier projects, shareholders benefit at the expense of creditors. This type of compensation aggravates creditor-shareholder agency conflicts. To mitigate this effect, firms should borrow in the short rather than long term because short-term debt is less sensitive to changes in firm risk and alleviates the risk-shifting agency problem (Barnea, Haugen, and Senbet, 1980; Leland and Toft, 1996). We call this the "creditor hypothesis." Second, corporate financing and investment decisions are, to a large extent, at the discretion of management. With stock- and option-based compensation, managers have incentives to adopt risky policies such as borrowing debt in the short rather than long term and, thereby, increase the firm's rollover and liquidity risk (Diamond, 1991; Brunnermeier, 2009; Gopalan, Song, and Yerramilli, 2014). We call this the "manager hypothesis."

While the theory on how managerial compensation incentives affect corporate debt maturity choices are well established, the empirical relevance has received little attention. This is partly due to the two main challenges we face in empirical studies: (1) establishing a causal relationship is difficult because compensation structures are jointly determined with debt maturity decisions and (2) identifying the underlying mechanism through which managerial compensation incentives affect corporate debt maturity is also challenging as the above two hypotheses lead to the same prediction on the relationship. In this paper, to establish the casual link, we use a quasi-natural experiment created by the 2005 mandate that firms

comply with Financial Accounting Standard (FAS) 123R, which works as a negative exogenous shock to the risk-taking incentives in managerial compensation. Our empirical results show that the reduction in the risk-taking incentives in managerial compensation induced by FAS 123R has resulted in a significant increase in debt maturity. To disentangle the two mechanisms, we study the effect of FAS 123R on net debt issuance and corporate leverage decisions, as well as cross-sectional variations of the effect of FAS 123R on debt maturity. Our empirical evidence supports the creditor hypothesis.

FAS 123R requires firms to expense executive and employee stock options at fair value, which dramatically increases the cost of using options to compensate managers (Murphy, 2013). The empirical literature, e.g., Carter, Lynch, and Tuna (2007), Hayes, Lemmon, and Qiu (2012), and Bakke, Mahmudi, Fernando, and Salas (2016), document a significant cutback in option compensation and a simultaneous reduction in managerial risk-taking incentives as measured by "vega", i.e., the sensitivity of the CEO's wealth to a firm's stock return volatility[1]. This sudden drop in vega induced by the adoption of FAS 123R provides us an ideal opportunity to examine the causal relationship.

To empirically test how the adoption of FAS 123R affects corporate debt maturity, we use comprehensive data on debt issues including both bond and loan issues as well as CEO compensation packages during the period 2003−2007. Because the fair value expensing requirement for stock options became effective on December 15, 2005, we define fiscal year 2003−2004 as the pre-FAS 123R period and fiscal year 2005−2007 as the post-FAS 123R period. As in Bakke et al. (2016), firms in the control group are defined as those that did not grant options to CEOs in 2003 and 2004, or those that already voluntarily chose to expense the stock options at fair value in or prior to 2002. These two groups of firms are unlikely to be affected by FAS 123R. We employ a difference-in-differences methodology.

As in the literature, e.g., Hayes et al. (2012) and Bakke et al. (2016), we also confirm a significant drop in vega after the adoption of FAS 123R for treated firms relative to control

[1]See Guay (1999), Core and Guay (2002), Low (2009) and Hayes et al. (2012).

firms. Meanwhile, we test whether the adoption of FAS 123R also increases the sensitivity of CEO wealth to stock price (delta). This might happen because after the regulatory change, treated firms may reduce their option compensation and switch to using more restricted stocks or long-term incentive plans, which might result in an increase in delta. Knopf, Nam, and Thornton (2002) and Brockman, Martin, and Unlu (2010) argue that the higher the delta, the weaker are the risk-taking incentives of risk-averse managers. If this is true, then the increase in delta might contaminate the effect of the increase in the vega induced by FAS 123R on debt maturity. In this paper, we find no significant impact of FAS 123R on delta. These empirical results are reassuring and validate that our natural experiment operates through a large negative shock to the risk-taking incentives in managerial compensation as measured by vega.

Our difference-in-differences regression results show a significant increase in debt maturity for treated firms from pre- to post- FAS 123R relative to control firms caused by the decline in vega. This effect is also economically significant: the maturity of debt issues of the treated firms increases by 0.15 log points from the pre- to post-event period relative to that of the control firms. One concern of the regressions is that the treated and control firms are not randomly selected and the heterogeneity of the two groups might predict the result.

To address this issue, we take several different approaches. First, we control for common determinants of debt maturity as in the literature, as well as firm and year fixed effects in our regression. This approach helps control for differences between treatment and control groups (Roberts and Whited, 2013). Second, we find similar trends in debt maturity of the two groups in the pre-FAS 123R period (2003−2004). Several placebo tests over a number of years preceding or after the passage of FAS 123R also confirm that our results only hold around the adoption of FAS 123R. These results suggest that the parallel trend assumption, the key assumption behind the difference-in-differences regressions, is likely to hold in our setting. Third, we further confirm the robustness of our results by controlling for omitted industry specific trends during that period, as captured by industry-by-year fixed effects, and

the potential effects of some concurrent events, e.g., the development of credit default swap markets and the activeness of loan securitization markets. Fourth, we adopt an alternative approach to address the problem of lacking a control group for the adoption of FAS 123R and find that our results are robust.

To uncover the channel through which FAS 123R affects debt maturity, we examine the impact of FAS 123R on net debt issuance decisions. The creditor hypothesis predicts an increase in net debt issuances because FAS 123R reduces the risk-shifting agency problem and creditors would be willing to lend more to the firm. In contrast, the manager hypothesis predicts a reduction in net debt issuances because managers have weaker risk-taking incentives after the adoption FAS 123R and will borrow less. Consistent with the creditor hypothesis, our empirical analysis finds a significant increase in net debt issuances for treated firms relative to control firms during the adoption of FAS 123R. In addition, we find a similar result on the impact of FAS 123R on corporate leverage, also supporting the creditor hypothesis.

To further disentangle the two mechanisms, we also link the effect of FAS 123R on debt maturity with firm characteristics. If the passage of FAS 123R increases debt maturity through alleviating creditor-shareholder agency conflicts, then we expect this effect to be more evident for firms in which the risk-shifting problem is a bigger concern. Based on the literature, e.g., Guedes and Opler (1996), Johnson (2003), and Eisdorfer (2008), the risk-shifting problem is a greater concern in firms with more growth opportunities and those from non-regulated industries. In line with these views, we find that the effect of FAS 123R on debt maturity is stronger in those firms. If FAS 123R affects debt maturity through managers' decisions to reduce risk, then we expect this effect to be stronger in firms with weaker corporate governance where managers are less monitored and have more discretion in changing firm risks. However, we do not find empirical evidence consistent with the prediction. Therefore, these cross-sectional empirical findings further support the creditor hypothesis rather than the manager hypothesis.

Our paper contributes to the literature on corporate debt maturity and its determinants[2]. The work of Brockman et al. (2010), which is most related to ours, investigates the relationship between CEO compensation incentives and debt maturity choices. However, their conclusions have endogeneity concerns due to the well-known identification challenges, i.e., the difficulty of finding good instruments or quasi-exogenous shocks to CEO pay, to allow identification of the effects of managerial incentives (Edmans and Gabaix, 2016). However, our paper establishes a causal relationship through a quasi-natural experiment—the adoption of FAS 123R. We also add a new dimension of analysis and contribute by investigating and disentangling the two underlying mechanisms behind this relationship.

Our paper also contributes to the large, but hitherto inconclusive literature that studies the effects of option-based compensation or convexity in compensation on corporate risk-taking policies[3]. On the one hand, some studies document a positive relationship by showing that convexity reduces leverage or increases firm volatility, hedging intensity, cash balances, and investment riskiness (Low, 2009; Chava and Purnanandam, 2010; Gormley, Matsa, and Milbourn, 2013; Bakke et al., 2016). On the other hand, some other studies do not find a positive link by documenting option compensation reduces debt financing or results in less risky investments and financial policies (Lewellen, 2006; Hayes et al., 2012).

Our paper contributes to the above debate by arguing that the inconclusive result between managerial compensation risk-taking incentives and financial policies is likely due to the negligence of one potential mechanism, i.e., the creditor channel. In contrast to the manager channel, the creditor channel has an opposite prediction on how the convexity of managerial compensation affects some financial policies, e.g., leverage and net debt issuances. The literature mainly focuses on the manager channel, while ignoring the role of creditors in determining the financial policies when they face less risk-promoting managerial compensa-

[2]See Barclay and Smith (1995), Guedes and Opler (1996), Stohs and Mauer (1996), Datta, Iskandar-Datta, and Raman (2005), Berger, Espinosa-Vega, Frame, and Miller (2005), Billett, King, and Mauer (2007), Brockman et al. (2010) and Goyal and Wang (2013).

[3]See Guay (1999), Coles, Daniel, and Naveen (2006), Low (2009), Chava and Purnanandam (2010), Liu and Mauer (2011), Hayes et al. (2012), Bakke et al. (2016), and Ferri and Li (2016)

tion. Consideration of the creditor channel helps reconcile why some studies, e.g., Lewellen (2006) and Hayes et al. (2012), find that managers acting with greater risk-taking incentives induced by compensation reduce rather than increase leverage.

The remainder of the paper is organized as follows. Section 2 discusses the FAS 123R and the accounting treatment of option compensation before and after its adoption. Section 3 explains our identification strategy. Section 4 presents our main data, variables and summary statistics. Section 5 describes our main empirical analysis. Section 6 investigates the underlying mechanisms and Section 7 concludes.

2. FAS 123R and the Accounting Treatment of Option Compensation

To establish the causal effect of managerial compensation incentives on debt maturity structure, we use a quasi-natural experiment: the issuance of FAS 123R in 2004 by Financial Accounting Standards Board (FASB). The FAS 123R requires companies to expense their executive and employee stock options at fair value and this rule became effective for the first reporting period beginning after June 15, 2005. Fair value approach means that the companies must charge the cost of stock options at grant date based an option valuation model such Black and Scholes. However, prior to FAS 123R, there are two alternative accounting treatments for stock options: Firms can expense the stock options at either intrinsic value or fair value. By using intrinsic value method, companies can avoid writing expenses on options in income statement since they normally set the strike price of options equal to or above the stock price when options are granted.[4] It is not surprising that prior to FAS 123R, nearly all firms employed the intrinsic value method. Therefore, the adoption of FAS 123R has significantly increased the accounting cost of using options to compensate managers, resulting in a sharp reduction in the option compensation, which has been well

[4]The fair value of options as of the grant date was disclosed in a footnote of the financial statement.

documented in the literature, e.g., Hayes et al. (2012), Bakke et al. (2016) and Ferri and Li (2016).

3. Identification Strategy

As argued by Lye and Shorter (2003) and Bakke et al. (2016), the adoption of FAS 123R came under the background that investors and regulators called for more transparency of financial statements and option compensation expenses after the financial scandals of Enron and WorldCom. Thus, we feel that this regulatory change should be largely uncorrelated with corporate debt maturity choices. Another concern is that firms might lobby for or against the adoption of FAS 123R, which might undermine the effectiveness of this natural experiment in identifying the causal effects. However, as argued in Bakke et al. (2016), this is not a concern since most firms would lobby against rather than for the adoption of FAS 123R since they would suffer from using fair value method to expense stock options. Even if some firms might lobby for the adoption of the regulatory change,[5] it is difficult to imagine that the lobby activities would be correlated with corporate debt maturity choices. Thus, the implementation of FAS 123R in 2005 provides us a source of exogenous variation in CEO option compensation and managerial risk-taking incentives.

However, one problem in using FAS 123R as an exogenous shock is that it applies to all the firms at the same time. A simple comparison of outcome between pre- and post-event would assume such change is only driven by the adoption of FAS 123R. We cannot rule out other possible time trends which might lead to the same effect. Chava and Purnanandam (2010) and Anantharaman and Lee (2014) use an alternative strategy by investigating the change in option-based compensation around the FAS 123R and assuming such change is exogenous. However, as argued by Ferri and Li (2016), firms' response in the option compensation to the adoption of FAS 123R cannot be entirely exogenous.

[5]Bakke et al. (2016) has mentioned one possibility that "our control groups could obtain competitive benefits from the elimination of the favorable accounting treatment of options allowed before FAS 123R and availed of by firms in the treatment group."

In this paper, as Bakke et al. (2016), we employ two sets of firms that are unlikely to be affected by the adoption of FAS 123R as our control sample. The first control group includes firms that did not pay options to their CEOs in 2003 and 2004. These firms are not affected by the implementation of the regulatory change since they do not have option grants before the event. The second group includes firms that have already adopted FAS 123R in or before 2002. These firms are not affected since they already implemented the fair value approach well before the regulatory change.

In our empirical analysis, we use a difference-in-differences methodology to identify the effect of a sharp change in option compensation induced by FAS 123R on corporate debt maturity structure. The specific specification is as follows:

$$Maturity_{it} = \alpha_i + \delta_t + \beta \times Treatment_i \times Post_t + \gamma \times Controls_{it} + \epsilon_{it}. \tag{1}$$

$Maturity_{it}$ is the debt maturity of firm i at time t. $Treatment_i$ is a dummy variable which is equal to 1 if the firm belongs to the treated group and 0 otherwise. $Post_t$ is an event dummy that equals 1 after the event and 0 otherwise. α_i captures firm fixed effects and δ_t captures year fixed effects. $Control_{it}$ are the common determinants for corporate debt maturity used in the literature. The coefficient β of the interaction term is the difference-in-differences estimate of the effect of FAS 123R on debt maturity. The adoption of FAS 123R significantly reduces option compensation and vega in the treated group, thus we expect to see a significant increase in the debt maturity for treated firms from pre- to post-event relative to control firms. That is, we expect to observe $\beta > 0$.

Although difference-in-differences regressions can take care of the threats of permanent differences between treated and control groups and common trends affecting both samples, time-varying heterogeneity of the two groups can generate endogeneity concerns which undermines the internal validity of the estimator. To address this issue, we take several different approaches. First, we control for time varying common determinants of corporate debt ma-

turity in our baseline regressions. Second, we test whether the pre-event trends of debt maturity are similar in two groups and conduct several placebo tests to ensure that the effect of FAS 123R on debt maturity concentrates on the adoption time of the regulatory change. Third, we also conduct a series of robustness tests by controlling for other omitted concurrent events and time varying industry specific events. Last but not the least, we check the robustness of our results by taking an alternative approach to deal with the lack of a control group.

4. Data and Variables

The question on how the adoption of FAS 123R affects corporate debt maturity can be better understood if we study the debt maturity in the incremental approach as Guedes and Opler (1996)—the maturity of debt issues, since debt issues can respond and adjust quickly to the regulatory shock.[6] We use Thomson One as our source to obtain the data on debt maturity structure of the bond and loan issues.[7] We collect the CEO compensation and ownership data, such as salary, bonus, options, restricted stocks and long-term incentive awards, from ExecuComp database. The firm characteristics and stock returns information are from the Compustat and CRSP database, respectively.

We choose the sample from fiscal year 2003 to fiscal year 2007 to study the impact of the adoption of FAS 123R on debt maturity choices. We define fiscal year 2005 as the beginning of the post-FAS 123R period. Similar to Ferri and Li (2016), we choose 2003 as the starting period in order to capture a period subsequent to the 2003 tax cut on individual dividend income, and 2007 as the last period to avoid the financial crisis period. Following the prior literature on debt maturity, e.g., Barclay and Smith (1995), Datta et al. (2005) and Brockman et al. (2010), we focus on industrial firms with industry classification (SIC) code

[6]Guedes and Opler (1996) argue that "some questions about the determinants of debt maturity are better answered by the incremental approach ... In particular, the incremental approach is well suited to test theories that rely on state variables that fluctuate substantially over time ... Another advantage is that it can identify the determinants of financing choices at all points of the maturity spectrum."

[7]Thomson One provides the same data on debt issues as SDC Platinum.

between 2000 to 5999. In addition, we require all sample firms have at least one year of data in both the pre- and post-event periods. In the end, our sample includes totally 402 unique firms and 1,189 firm-year observations. The control sample includes firms that did not pay any options to their CEOs in 2003 and 2004, and firms that started expensing options using the fair value method in or prior to 2002 (McConnell et al., 2004). We have identified 308 firms in the treated group and 94 firms in the control group[8].

As Brockman et al. (2010), we construct the maturity of corporate debt by consolidating the debt issues sample into a firm-year format. We have two measures for debt maturity. Our first measure, LMAT, is computed as the logarithm of the equal-weighted average maturity of debt issues including both bonds and loans for a firm in a year. Our second measure, LMAT_WT, is computed as the logarithm of the issue size-weighted average. The CEO compensation vega and delta are computed following the methodology of Guay (1999), Core and Guay (2002), Coles et al. (2006) and Hayes et al. (2012). The vega is defined as the change in the value of CEO compensation in response to a 0.01 increase in the annualized standard deviation of the firm's stock returns. It reflects the managerial risk-taking incentives. The delta is measured as the change in the value of CEO compensation due to a 1% change in the firm's stock price and reflects the pay performance sensitivity. We compute the vega and delta for the CEO's both current year grants of stocks and options (VEGA_C and DELTA_C) and total portfolio of current and outstanding prior grants (VEGA_P and DELTA_P).

To explain the corporate debt maturity, following Brockman et al. (2010), the control variables we include are: firm size (LSIZE), the square of firm size (LSIZE2), leverage (LEVERAGE), asset maturity (ASSET_MAT), managerial ownership (OWN), market-to-book ratio (MB), term structure of interest rates (TERM), abnormal earnings (ABNEARN), asset return standard deviations (STD_DEV), and dummy variables for firms with S&P credit rat-

[8]3 of 94 firms have already adopted the fair value method in or before 2002 based on the equity research report, which is comparable to Ferri and Li (2016) with 6 of totally 177 control firms voluntarily expensing stock options well in advance. Our results are similar if we only select the firms that did not pay options to their CEOs in the pre-treatment period in control group.

ings (RATE_DUM), firms with a high Altman (1977) Z-score (ZSCORE_DUM), and firms from regulated industries (REG_DUM). To explain the CEO compensation structure, following the compensation literature, e.g., Guay (1999), Hayes et al. (2012), Gormley et al. (2013) and Ellul, Wang, and Zhang (2016), we include some additional variables: return on assets (ROA), tangibility of assets (TANGIBILITY), CEO tenure (TENURE), and the proportion of salary and bonus in CEO compensation (CASHCOMP). All the variables, except the dummy variables, are winsorized at 1st and 99th percentile. The detailed construction of these variables are in Appendix A.

Table 1 presents summary statistics of debt maturity, delta, vega, the proportion of option pay in CEO compensation, and other firm and CEO characteristics. Panel (a) covers all the sample period from 2003 to 2007. We have 1,189 firm-year observations. During this period, options are very popular in CEO compensation, accounting for 27.1% of the current year compensation. The logarithm of the average maturity of debt issues are similar in both measures, around 1.8. Panel (b) provides summary statistics for the periods before and after the implementation of FAS 123R. We can see that, the proportion of option pay in CEO compensation drops substantially after the adoption of FAS 123R. During the pre-FAS 123R period, the option pay accounts for 33.1% of compensation, while dramatically reduces to 21.8% after the event. This observation is in line with that the adoption of stock option expensing at fair value makes options less attractive. The portfolio delta (Delta_P) increases from 716.1 before FAS 123R to 822.3 after FAS 123R. The current delta (Delta_C) also increases from 64.92 to 82.51. This is consistent with firms replacing option pay with other performance-based pay, such as restricted stocks and long-term incentive awards following the regulatory change. The portfolio vega (VEGA_P) drops from 222.4 to 207.4 and the current vega (VEGA_C) also reduces from 43.10 to 40.22. It implies that after the adoption-FAS 123R, the compensation structure becomes less convex. The changes in the option pay, delta and vega following the adoption of FAS 123R are consistent with Hayes et al. (2012) and Bakke et al. (2016).

Now we look at how the outcome of interest of the current paper, i.e., the debt maturity structure, changes around the implementation of FAS 123R. From both measures, we can see that debt maturity increases after the adoption of FAS 123R. The logarithm of the equally weighted (size-weighted) maturity increases from 1.686 (1.666) to 1.928 (1.900). That is, the maturity of debt issues increases by 0.242 log points (0.234 log points) from pre- to post-event period. While the summary statistics show that firms borrow in the longer term following the regulatory change, we also observe simultaneous changes in other variables across the two subperiods. Thus, it is important to control for other variables in our analysis to separate the effect on debt maturity due to changes in vega from changes in other time-varying factors. The summary statistics of other control variables are consistent with the debt maturity literature, i.e., Johnson (2003), Datta et al. (2005), Billett et al. (2007), and Brockman et al. (2010).

5. FAS 123R and Debt Maturity

In this section, we study the effect of FAS 123R on corporate debt maturity choices. Section 5.1 presents the baseline regression results. Section 5.2 offers several tests to address the endogeneity concern.

5.1. Baseline Results

We first study how the adoption of FAS 123R affects the usage of options in compensation and vega. Table 2 presents the regression results. The first two columns show that the implementation of FAS 123R dramatically reduces the attractiveness of options in CEO compensation. This result is robust after controlling for firm and CEO characteristics, as well as firm and year fixed effects. The result in Column (2) indicates that the ratio of the option pay in compensation of the treated firms reduces by 17.3% relative to that of the control firms, i.e., dropping by more than half of the pre-treatment mean (17.3%/33.1%).

In Columns $(3)-(4)$, we focus on the current vega, since current grants can be adjusted immediately following a shock to a firm (Low, 2009; Hayes et al., 2012; Gormley et al., 2013; De Angelis, Gustavo, and Michenaud, 2017). In all the three specifications, the effect of FAS 123R on vega is significantly negative at 1% level. In Column (4), the coefficient of interaction term TREATMENT_POST is -12.796, with t-statistic of -3.028. The magnitude is also economically significant: the vega of the treated firms is reduced by $12,796$ dollars relative to that of control firms, reducing the current vega to $30,304$ dollars, about 70% of the pre-treatment mean level (30.31/43.10). This decline in the compensation vega is consistent with Hayes et al. (2012) and Bakke et al. (2016).

Due to the adoption of FAS 123R, firms might switch from option pay to other performance-based pay, such as restricted stocks and long-term incentive awards, which can result in a change in delta. With higher delta, CEOs have weaker incentives to take risks (Knopf et al., 2002; Brockman et al., 2010). Thus, we also test the impact of FAS 123R on delta (DELTA_C), but do not find significant effect (see Columns $(5)-(6)$). This is comforting and avoids the possible contaminating effect from the change in delta on debt maturity. Our empirical results imply that FAS 123R works primarily as a large negative shock to vega.

Now, we study whether the adoption of FAS 123R affects the maturity structure of debt. Table 3 presents the results of difference-in-differences regressions. The coefficients of the interaction term in all six specifications are positive and significant at 1% or 5% level. By controlling for firm and CEO characteristics, as well as time and year fixed effects, the coefficient of the interaction term is about 0.15, which is economically significant: the maturity of debt issues of the treated firms increases by 0.15 log points from pre- to post-event relative to that of control firms. The robust standard errors are clustered at firm level to deal with the possible serial correlation of the dependent and independent variables within firms. All the specifications (with or without controls) in the regressions generate similar estimated treatment effect, which is reassuring since adding additional covariates in the regressions

has negligible effect on the estimates.[9] In addition, we find some control variables, e.g., LSIZE, LSIZE2, LEVERAGE, MB, ASSET_MAT and TERM, have significant impacts on debt maturity in Table 3 and are largely consistent with the literature.[10]

We also take a first-differencing approach as Ferri and Li (2016) where we collapse the panel to a single pre-FAS 123R (2003-2004) and a single post-FAS 123R (2005-2007) period by averaging across years and then measuring the changes in variables from Pre to Post. Thus, the depend variable captures the change in the maturity of debt issues from pre- to post- FAS 123R period. Table 4 describes the regression results. We control for firm and CEO characteristics. For each control variable, we include both its level in the pre-FAS 123R period and its change across the two periods. We also control for industry fixed effects. Our estimation of coefficient on TREATMENT is quantitatively similar across all the four specifications. The magnitude is also similar to that in the panel regressions.

5.2. Tests on Endogeneity

In this section, to establish a causal relationship, we offer additional tests to deal with the endogeneity issues. First, we investigate the pre-event trends of the outcome of our interest (debt maturity) for both the treated and control firms and perform several placebo tests to confirm that the parallel assumption is likely to hold in our setup. Second, we discuss and control for some alternative explanations which might drive the change in managerial compensation and debt maturity structure. Third, we test the robustness of our results by using an alternative approach to address the lack of a control group. Lastly, we offer some additional robustness tests.

[9]Roberts and Whited (2013) argue in the difference-in-differences analysis that "If the assignment is random, then including additional covariates should have a negligible effect on the estimated treatment effect. Thus, a large discrepancy between the treatment effect estimates with and without additional controls raises a red flag."

[10]The effect of market to book on debt maturity is consistent with Johnson (2003), Datta et al. (2005) and Billett et al. (2007). The effect of size on maturity is inconsistent with Johnson (2003) but in line with Guedes and Opler (1996). It might because we use the incremental approach as Guedes and Opler (1996) while Johnson (2003) and others mainly use balance sheet approach. The coefficients on other variables such as leverage, asset maturity, term structure are generally consistent with those reported in Johnson (2003), Datta et al. (2005), Brockman et al. (2010) and Custódio, Miguel, and Laureano (2013).

5.2.1. Pre-event Trends and Placebo Tests

While the parallel trend assumption is not directly testable, similar to other difference-in-differences studies, we first study whether the debt maturity of both the treated and control group experienced the same trend before the adoption of FAS 123R (2003−2004). Figure 1 indicates that both groups have exhibited similar trends before 2004: the debt maturity of both groups gradually increased, and the debt maturity of the control firms was persistently longer than that of the treated firms. However, after the adoption of FAS 123R, the debt maturity of treated firms increased dramatically and exceeded that of the control firms. In addition, we also formally test the change in the debt maturity during the pre-FAS 123R period between treated and control firms and find no significant difference.

Second, we perform several placebo (falsification) tests before and after the adoption of FAS 123R by assuming that a treatment occurs. Regarding the test in the periods preceding the regulatory change, we choose 2000−2001 as the pre-event period and 2002−2003 as the post-event period. 2002 is assumed to be the event year. We perform two placebo tests during this period. First, we define control firms as those that did not grant options to CEOs during period 2000−2001 and other firms as treatment firms. Second, we use the same treated and control firms as in our real test of FAS 123R. Table 5 shows the difference-in-differences regression results. We find no significant results in both specifications.

Regarding the placebo tests in the periods after the implementation of FAS 123R, we choose 2006 as the pre-event period and 2007 as the post-event period to avoid the financial crisis period as well as the period of our main study (2003−2007) as much as possible. Similarly, we perform two placebo tests, one with new control and treatment firms while the other with the same treatment and control firms as in our real test. Table 6 shows no significant results either. These tests indicate that the changes in debt maturity are similar for both the treated and control firms outside the tight window around FAS 123R. These findings confirm that the changes in debt maturity is likely to be driven by the adoption of FAS 123R.

5.2.2. Alternative Explanations

In this section, we offer robustness tests by controlling for alternative explanations of the observed increase in debt maturity. There are two classes of alternate explanations: the development of markets for financial innovation, such as credit default swaps and collateralized loan securitization, and industry-specific time-varying concerns captured by industry-by-year fixed effects.

First, the markets of financial innovation such as credit default swaps and collateralized loan securitization have grown explosively after 2000, especially during the mid of 2000s. These two markets allow creditors to hedge against the credit risk of the referenced firms in a more convenient and cheaper way. This reduces creditor-shareholder agency conflicts, which thus lead to less usage of short-term debt to mitigate the agency problems. The increase in debt maturity we observed in our tests might be driven by the financial innovation during the same period. Thus, we control for these two concurrent events.

To capture the credit default swaps trading, we use CDS_TRADING which is indicator variable that equals one if the firm has quoted CDS contracts on its debt during year t, and zero otherwise. To measure the level of loan securitization, we use SECU_ACTIVE, which is indicator variable that equals one if firm has a lead bank lender in year t belonging to Top 10 securitization-active banks, and zero otherwise. Based on the results of Nadauld and Weisbach (2012) that during 2002−2007, about 80% of new collateralized loan obligations were originated by top 10 ten banks, and the creation of CLOs was active in a short time period and concentrated in a very small number of banks. Thus, we expect that firms having a lending relationship with a bank who is active in originating CLOs have higher probability to securitize their loans. Table 7 shows that after controlling for CDS_TRADING and SECU_ACTIVE, our results are robust.

Second, we augment the baseline regression by replacing year fixed effects with industry-by-year fixed effects. We include industry-by-year effects because the recent empirical literature, e.g., Leary and Roberts (2014), documents the importance of industry characteristics

in determining a firm's capital structure choices. It is possible that the increase in debt maturity in our setting might be driven by some unobservable time-varying industry factors during that period. For example, US firms' competitive landscape in different industries has dramatically changed because of globalization, especially, after China joined WTO in 2001 (Bloom, Draca, and Van Reenen, 2016; Pierce and Schott, 2016). The change in the competition landscape might lead to adjustments in CEO compensation and leverage structure at the same time. By controlling for industry-by-year fixed effects, we control for those possibilities. The last two columns of Table 7 show that our results are still robust.

5.2.3. An Alternative Approach to Address the Lack of a Control Group

One drawback of using FAS 123R as an exogenous shock is that the regulatory change applied to all the firms in the US. To deal with this problem, we define control firms as those that did not grant options in 2003 and 2004 or already expensed options at fair value in or prior to 2002. However, unobservable time-varying differences between treated and control firms might drive our results. To further alleviate this concern, we use an alternative way to overcome the problem of lacking a control group and check the robustness of our results.

We capture the cross-sectional variation in the impact of FAS 123R in debt maturity by using the accounting impact of the regulatory requirement on CEOs, measured by the logarithm of the value (the number) of CEO stock option grants in 2002. CEOs granted with more options prior to the adoption of FAS 123R are more affected by this event. We specifically look at CEO stock option grants because CEO incentives are critical to determine a firm's financial policy. We measure this variable in 2002 rather than 2003 or 2004 to avoid any confounding effect from the expected adoption of FAS 123R.

Panel (a) of Table 8 shows that, with both measures, firms experiences a significantly larger increase in debt maturity if CEOs were granted more options in 2002. Panel (b) shows that the effect of FAS 123R on debt maturity starts to appear on 2005 and 2006, while no effect is discovered during the pre-event period. This further confirms that the changes in

debt maturity is likely to be driven by the adoption of FAS 123R. This new approach to overcome the lack of a control group reassures us the robustness of our results.

5.2.4. Additional Robustness Tests

We here conduct several additional tests to show the robustness of our main findings.

First, our empirical analyses indicate that the quasi-natural experiment operates through a negative shock to vega, leading to an increase in corporate debt maturity. Thus, we expect that the effect of FAS 123R on debt maturity is more evident for firms facing larger drops in vega from pre- to post-event. We calculate the ΔVEGA as the difference of the average portfolio vega of CEO between the pre-FAS 123R period (2003-2004) and the post-FAS 123R period (2005-2007).[11]

Table 9 states the triple differences regression results. The coefficient of interest is the triple interaction term ΔVEGA_TREATMENT_POST. We can see that the coefficient in both specifications are positive and economically significant: a one standard deviation increase in the drop of vega results in a 0.17 log points increase in debt maturity in treated group relative to control group. In the first specification, the coefficient is significant at 10% level while in the second specification, it is significant at 11% level. Thus, the results are consistent with the theory that firms facing larger drops in vega are more likely to increase debt maturity after the implementation of FAS 123R.

Second, we check the robustness of our results by controlling for delta. The results are reported in Table 10. Since the delta also affects the risk-taking incentives of managers (Knopf et al., 2002; Brockman et al., 2010), to further avoid the possible contamination effect of the change in delta induced by FAS 123R on debt maturity choice, we control delta in our difference-in-differences regressions for robustness check (despite we already find an insignificant impact of FAS 123R on delta in Section 5.1). We include the logarithm of the portfolio delta as Brockman et al. (2010) as the control variable and our results are

[11] Δ VEGA has a mean of 19.34 and a standard deviation of 173.79.

not changed. The above findings are reassuring and validate that our natural experiment operates through a large negative shock to the compensation vega.

6. Potential Mechanisms

In the previous analyses, we show a significant positive effect of FAS 123R on corporate debt maturity choice. There are two mechanisms through which we can explain this result. The creditor hypothesis argues that FAS 123R reduces managers' risk-taking incentives and mitigates creditor-shareholder agency conflicts, thus short-term debt is less needed to limit the firm's risk-shifting agency problem. The manager hypothesis predicts that managers have weaker risk-taking incentives after FAS 123R, thus they will take debt in longer term to limit the refinancing and rollover risks. To explore which mechanism is at work, we take two approaches: (1) study the impact of the regulatory change on net debt issuances and (2) investigate the cross-sectional variations of the effect of FAS 123R on debt maturity.

6.1. FAS 123R and Net Debt Issuances

This section studies the impact of FAS 123R on net debt issuances. We investigate net debt issuances since the flow variable changes more quickly to the sudden shock. The creditor hypothesis predicts an increase in net debt issuances after FAS 123R because of the mitigation of creditor-shareholder agency conflicts. On the contrary, the manager hypothesis indicates a decrease in net debt issuances due to managers' aversion to risk. Net debt issuances is computed as long-term debt issuance minus long-term debt reduction plus changes in current debt, scaled by the book value of assets (Chang, Dasgupta, and Hilary, 2006; Chu, forthcoming).

Table 11 shows a significantly positive impact of FAS 123R on net debt issuances. The results are also economically significant. Column (2) implies that relative to control firms, treated firms issue three more times debt of its mean level in the pre-event period

(0.056/0.018).[12] Figure 2 shows no significant difference in the trends of net debt issuances in the pre-event period (2003−2004) between the treated and control group: the net debt issuances in both groups gradually decreased during 2003−2004, and the control firms persistently issued more net debt than the treated firms. However, after the adoption of FAS 123R in 2005, the net debt issuances of treated firms increased dramatically and exceeded that of the control firms, while the net debt issuances of control firms continued to decrease. We also formally test the change in net debt issuances during the pre-FAS 123R period between treated and control firms and find no significant difference. Table 12 presents placebo tests pre- and after- FAS 123R, which also confirm that the effect only concentrates on the adoption of FAS 123R.

Similarly, we also find a significant increase in leverage around the adoption of FAS 123R for treated firms relative to control firms, but at a smaller magnitude since leverage is a state variable, which responds more slowly to the shock (untabulated). Thus, our overall evidence contradicts the manager hypothesis but consistent with the creditor hypothesis. In other words, the mitigation of creditor-shareholder conflicts by FAS 123R is the main mechanism at work, which drives the increase in debt maturity after the regulatory change.

6.2. Cross-sectional Variations

To further check whether the mitigation of creditor-shareholder agency conflicts due to the adoption of FAS 123R the main mechanism driving our results, we link the effect of FAS 123R on debt maturity with firm characteristics. With the creditor hypothesis, we expect the positive effect of FAS 123R on debt maturity to be more evident for firms with more severe risk-shifting agency problems. Guedes and Opler (1996), Johnson (2003), Eisdorfer (2008) and Custódio et al. (2013) argue that firms with more growth opportunities face potentially more severe risk-shifting problems because it is likely easier to increase the risk of new investments than assets in places. Barclay and Smith (1995), Guedes and Opler (1996), and

[12] In 2003-2004, net debt issuances has a mean of 0.018 and standard deviation of 0.122, which is consistent as Chu (forthcoming).

Eisdorfer (2008) argue that it is more difficult for firms from regulated industries to change the risk of investment since managers have less discretion in investment decisions in those industries. Therefore, we expect the increase in debt maturity after FAS 123R to be stronger for firms with more growth opportunities or from non-regulated industries.

Table 13 presents the triple differences results on how the effect of FAS 123R on debt maturity changes with firms' growth opportunities. We measure growth opportunities using firms' average market-to-book ratio in the pre-FAS 123R period. The coefficient of interest is the triple interaction MB_TREATMENT_POST. This coefficient is positive and significant in both specifications at 5% level. The magnitude is also economically significant. This is consistent with the theory that, firms with more growth opportunities face more severe risk-shifting problems, and therefore are more likely to increase debt maturity after the adoption of FAS 123R.

Table 14 reports the triple differences regression results on whether the effect of FAS 123R on debt maturity is weaker for regulated firms. The coefficient of interest is the triple interaction REG_TREATMENT_POST. This efficient is negative and economically significant. The coefficient is statistically significant at 10% in the first specification and 11% in the second specification. Therefore, the empirical evidence also confirms that regulated firms, facing less risk-shifting agency problems, are less likely to increase debt maturity after the adoption of FAS 123R.

However, if the manager hypothesis is the underlying mechanism, we expect the effect of FAS 123R on debt maturity to be more evident in firms with weaker corporate governance where managers are less monitored and have more discretion in changing firm risks. We use the governance index (GINDEX) compiled by Gompers, Ishii, and Metrick (2003) to measure the corporate governance. However, we do not find consistent empirical evidence supporting the manager hypothesis (untabulated).

In summary, our cross-sectional variations also also support the creditor hypothesis rather than the manager hypothesis.

7. Conclusion

In this paper, we study how the risk-taking incentives provided in managerial compensation (vega) affect corporate debt maturity choices. We establish the causal relationship by using a quasi-natural experiment: the adoption of FAS 123R. FAS 123R requires firms to expense stock options for employees and executives at fair value, which significantly increased the accounting cost of option compensation, thus leading to a sharp decline in the option-based compensation and vega. Our empirical tests show that the reduction in vega induced by FAS 123R causes a significant increase in corporate debt maturity.

This paper also identifies the underlying mechanism which drives the relationship between compensation incentives and debt maturity. There are two mechanisms leading to the same conclusion: the creditor hypothesis, i.e., FAS 123R mitigates creditor-shareholder conflicts and thus short-term debt will be less needed, and the manager hypothesis, i.e., FAS 123R decreases the managers' risk-taking incentives and thus reduces their incentives to take short-term debt to limit the refinancing and rollover risk. We further test the effect of FAS 123R on net debt issuances as well as corporate leverage choices and find empirical results only supporting the creditor hypothesis. In addition, our cross-sectional variation tests also present findings consistent with the creditor hypothesis rather than the manager hypothesis.

Appendix A. Variables Definition and Data Sources

LMAT is computed as the logarithm of the equal-weighted average maturity of debt issues including both bond and loan issues for a firm in a year. Source: Thomson One.

LMAT_WT is computed as the logarithm of the issue size-weighted average maturity of debt issues including both bond and loan issues for a firm in a year. Source: Thomson One.

VEGA_P is equal to (Black-Scholes Vega of all current option grants + Black-Scholes Vega of all prior option grants) $\times$ 0.01. Source: ExecuComp.

VEGA_C is computed as Black-Scholes Vega of all current option grants $\times$ 0.01. Source: ExecuComp.

DELTA_P is equal to (Black-Scholes Delta of all current option grants + number of shares of current restricted stock grants + number of targeted shares granted under LTIA + Black-Scholes Delta of all prior option grants + number of prior shares of restricted stock + number of prior shares granted under LTIA) $\times$ (fiscal year-end price ($prcc_f$) $\times$0.01). Source: ExecuComp.

DELTA_C is equal to (Black-Scholes Delta of all current option grants + number of shares of current restricted stock grants + number of targeted shares granted under LTIA) $\times$ (fiscal year-end price ($prcc_f$) $\times$0.01). Source: ExecuComp.

OPTION_PAY is computed as the value of options scaled by current year compensation, where current year compensation is equal to the sum of salary, bonus, value of restricted stocks, value of LTIA and value of options. Source: ExecuComp.

LSIZE is the logarithm of the market value of the firm, where the market value of firm is equal to the market value of equity (number of shares outstanding times stock price at the end of fiscal year, i.e., $cshpri \times prcc_f$) plus book value of total assets (at) minus the book value of equity (ceq). Source: Compustat.

LSIZE2 is the square of LSIZE. Source: Compustat.

LEVERAGE is equal to the long-term debt ($dltt$) divided by the market value of the firm.

ASSET_MAT measures the book value-weighted average of the maturities of property, plant and equipment and current assets, computed as (gross property, plant, and equipment ($ppegt$) /total assets (at)) $\times$ (gross property, plant, and equipment ($ppegt$) /depreciation expense (dp) =) plus (current assets (act) /total assets (at)) $\times$ (current assets (act) /costs of good sold ($cogs$)). Source: Compustat.

OWN is measured by number of shares owned by the CEO ($shrown$) divided by shares-outstanding ($cshpri \times 1000$). Source: ExecuComp.

MB is market value of the firm divided by the book value of total assets. Source: Compustat.

TERM is yield on 10-year government bonds substracted from the yield on 6-month government bills at the fiscal year end. Source: "Treasury constant maturities" using the "annual" series in Federal Reserve website: http://www.federalreserve.gov/releases/h15/data.htmfn11.

ABNEARN is (earnings at yet $t+1$ ($ibadj$) minus earnings in year t) divided by (stock price ($prcc_f$) times number of shares outstanding ($cshpri$) at year t). Source: Compustat.

STD_DEV measures the monthly stock return standard deviation during the fiscal year multipled by the ratio of market value equity ($prcc_f \times cshpri$) to the market value of firm. Source: CRSP and Compustat.

RATE_DUM is a dummy variable which equals 1 if the firm has an S&P rating on the long-term debt and 0 otherwise. REGDUM is a dummy variable which equals 1 if the firm's SIC code is between $4,900$ and $4,939$ and 0 otherwise. Source: Compustat.

ZSCORE_DUM is a dummy variable which equals 1 if Altman's Z-score is greater than 1.81 and 0 otherwise. Altman's Z-score is computed as $3.3 \times oiadp/at + 1.2 \times (act - lct)/at + sale/at + 0.6 \times prcc_f \times csho/(dltt + dlc) + 1.4 \times re/at$. Source: Compustat.

ROA is measured as income before extraordinary items (ib) scaled by book value of total assets (at). Source: Compustat.

TANGIBILITY is net property, plant and equipment ($ppent$) scaled by book value of

total assets (at). Source: Compustat.

TENURE is equal to the number of years that a manager has been CEO of the firm. Source: ExecuComp.

CASHCOMP is the sum of salary and bonus scaled by CEO's total compensation. Source: ExecuComp.

CDS_TRADING is an indicator variable that equals one if the firm has quoted CDS contracts on its debt during year t, and zero otherwise.

SECU_ACTIVE is an indicator variable that equals one if firm has a lead bank lender in year t belonging to Top 10 securitization-active banks ranked by Nadauld and Weisbach (2012), and zero otherwise.

LNOPTVAL is logarithm of the value of the CEO option grants in 2002. Source: Execucomp.

LNOPTNUM is logarithm of the number of CEO option grants in 2002. Source: Execucomp.

DEBTISSUE is computed as long-term debt issuance ($dltis$) minus long-term debt reduction ($dltr$) plus changes in current debt (Δdlc), scaled by the book value of assets (at). Source: Compustat.

GINDEX is the governance index. Source: Gompers et al. (2003).

Table 1: Summary Statistics

(a) Full Sample

VARIABLES	N	Mean	SD	25th percentile	Median	75th percentile
DELTA_P	1,189	772.3	1,111	144.6	361.4	892.1
DELTA_C	1,189	74.22	94.68	12.76	38.57	102.4
VEGA_P	1,189	214.5	309.2	33.54	98.86	250.8
VEGA_C	1,189	41.57	58.02	0	19.28	55.97
OPTION_PAY	1,189	0.271	0.252	0	0.237	0.447
LMAT	1,189	1.814	0.504	1.611	1.793	2.027
LMAT_WT	1,189	1.790	0.484	1.610	1.793	1.957
LSIZE	1,189	8.879	1.438	7.779	8.745	9.914
LSIZE2	1,189	80.90	26.16	60.51	76.48	98.29
LEVERAGE	1,189	0.159	0.112	0.0718	0.141	0.229
ASSET_MAT	1,189	12.01	10.30	4.437	8.443	16.25
OWN	1,189	0.0181	0.0421	0.00180	0.00420	0.0119
MB	1,189	1.776	0.753	1.247	1.518	2.047
TERM	1,189	1.166	1.371	0.0200	0.550	2.560
REG_DUM	1,189	0.139	0.346	0	0	0
ABNEARN	1,189	0.00483	0.0872	-0.00460	0.00631	0.0203
STD_RET	1,189	0.0434	0.0248	0.0261	0.0378	0.0550
RATE_DUM	1,189	0.818	0.386	1	1	1
ZSCORE_DUM	1,189	0.854	0.354	1	1	1
ROA	1,189	0.0525	0.0565	0.0271	0.0500	0.0824
TANGIBILITY	1,189	0.325	0.210	0.159	0.266	0.490
TENURE	1,189	6.178	5.447	2.668	4.688	7.756
CASHCOMP	1,189	0.338	0.293	0.140	0.244	0.430

(b) Pre- and Post- FAS 123R

	pre-FAS 123R				post-FAS 123R			
VARIABLES	N	Mean	SD	Median	N	Mean	SD	Median
DELTA_P	560	716.1	1,066	351.2	629	822.3	1,149	377.2
DELTA_C	560	64.92	81.45	34.48	629	82.51	104.4	43.60
VEGA_P	560	222.4	310.1	111.9	629	207.4	308.6	87.10
VEGA_C	560	43.10	59.01	20.31	629	40.22	57.15	18.27
OPTION_PAY	560	0.331	0.267	0.315	629	0.218	0.226	0.164
LMAT	560	1.686	0.531	1.792	629	1.928	0.449	1.793
LMAT_WT	560	1.666	0.518	1.792	629	1.900	0.424	1.793
LSIZE	560	8.719	1.437	8.598	629	9.021	1.425	8.873
LSIZE2	560	78.08	25.78	73.93	629	83.41	26.27	78.73
LEVERAGE	560	0.168	0.117	0.150	629	0.152	0.107	0.135
ASSET_MAT	560	12.24	10.18	8.768	629	11.81	10.41	8.236
OWN	560	0.0200	0.0461	0.00398	629	0.0164	0.0381	0.00437
MB	560	1.760	0.781	1.483	629	1.790	0.728	1.555
TERM	560	2.474	0.786	2.850	629	0.00143	0.349	0.0200
REG_DUM	560	0.138	0.345	0	629	0.140	0.347	0
ABNEARN	560	0.0137	0.0762	0.00879	629	-0.00309	0.0952	0.00469
STD_RET	560	0.0457	0.0267	0.0396	629	0.0412	0.0228	0.0367
RATE_DUM	560	0.816	0.388	1	629	0.820	0.384	1
ZSCORE_DUM	560	0.834	0.372	1	629	0.871	0.335	1
ROA	560	0.0481	0.0563	0.0467	629	0.0565	0.0565	0.0531
TANGIBILITY	560	0.336	0.208	0.275	629	0.316	0.211	0.256
TENURE	560	6.010	5.621	4.252	629	6.328	5.287	5
CASHCOMP	560	0.342	0.299	0.251	629	0.334	0.289	0.238

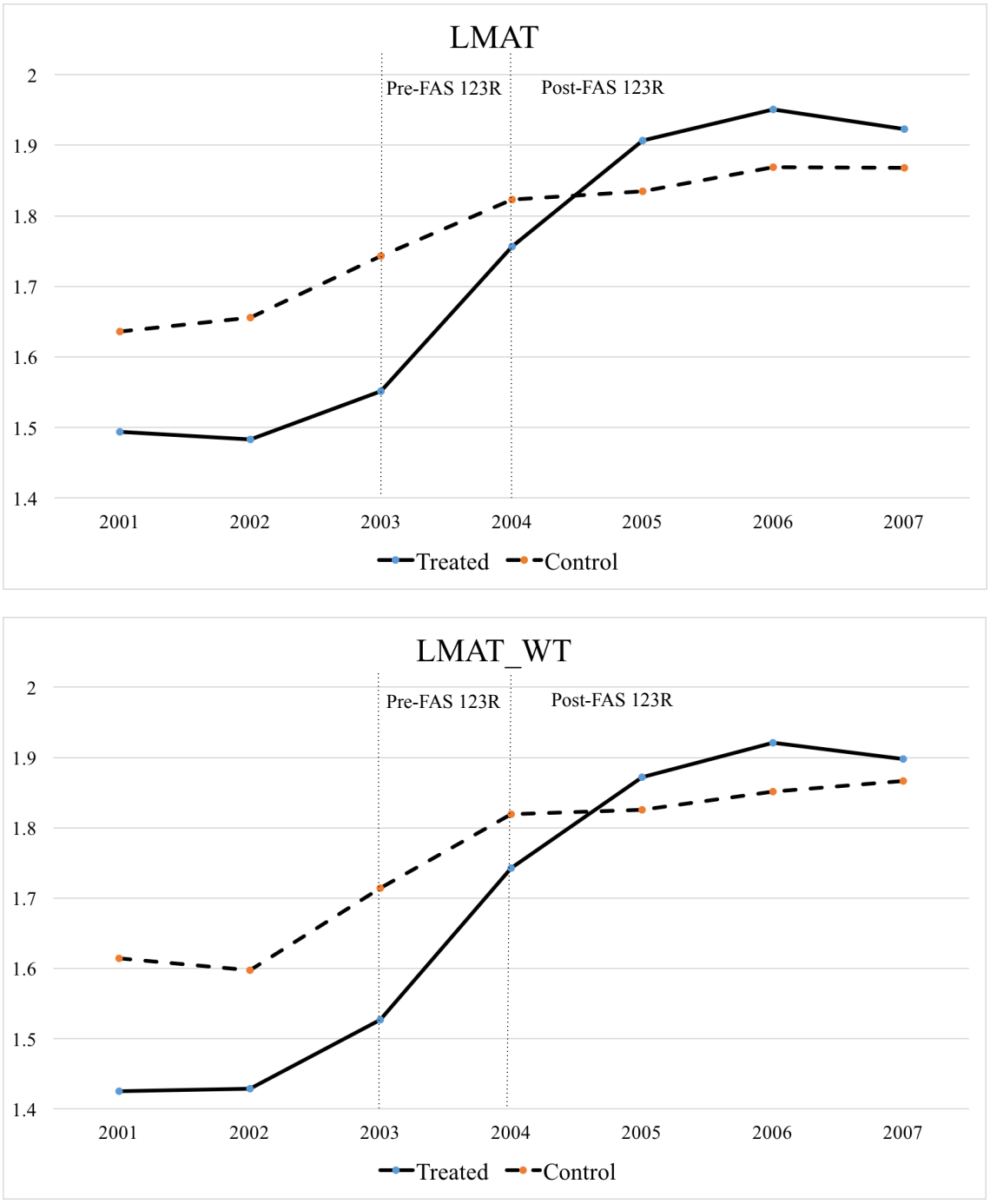
This table presents the summary statistics of the variables. Panel (a) contains the summary statistics for the variables over the entire sample period from fiscal year 2003 to 2007. Panel (b) presents the summary statistics pre- and post-FAS 123R. The pre-FAS 123R period is defined as fiscal years from 2003 to 2004. The post-FAS 123R is defined as fiscal years from 2005 to 2007. All the variables are defined as in Appendix A.

Table 2: Difference-in-differences Panel Regressions: The effect of FAS 123R on Option Pay, Vega and Delta

VARIABLES	OPTION_PAY		VEGA_C		DELTA_C	
	(1)	(2)	(3)	(4)	(5)	(6)
TREATMENT	0.252***		23.301***		-7.073	
	(12.651)		(4.624)		(-1.084)	
POST	0.010		-2.926		1.584	
	(0.465)		(-0.718)		(0.212)	
TREATMENT_POST	-0.156***	-0.173***	-9.563*	-12.796***	5.504	5.554
	(-6.213)	(-7.550)	(-1.963)	(-3.028)	(0.629)	(0.668)
LSIZE	0.005	0.008	18.494***	9.867	32.565***	54.260***
	(0.836)	(0.239)	(10.032)	(1.010)	(12.127)	(2.942)
LEVERAGE	-0.011	0.123	-57.443***	-11.294	-89.304***	-114.666**
	(-0.135)	(0.919)	(-3.101)	(-0.398)	(-2.830)	(-2.104)
MB	0.078***	0.098***	11.555**	7.542	8.787	8.021
	(4.812)	(4.125)	(2.572)	(1.379)	(1.377)	(0.726)
ROA	-0.356**	-0.204	-20.583	-11.664	-53.339	-116.472*
	(-2.408)	(-1.451)	(-0.579)	(-0.380)	(-0.807)	(-1.800)
STD_RET	0.889***	0.077	-54.247	-107.778	205.212*	-133.410
	(3.000)	(0.210)	(-0.723)	(-1.528)	(1.840)	(-0.837)
TANGIBILITY	-0.064*	-0.040	-22.616**	-35.481	-25.899*	105.781
	(-1.733)	(-0.188)	(-2.360)	(-0.993)	(-1.935)	(1.410)
TENURE	0.002*	-0.003	0.439	0.525	0.445	-0.187
	(1.914)	(-1.571)	(1.415)	(1.279)	(1.076)	(-0.225)
CASHCOMP	-0.294***	-0.290***	-32.300***	-37.779***	-104.894***	-119.194***
	(-12.454)	(-9.718)	(-6.019)	(-5.068)	(-11.494)	(-8.699)
Constant	0.031	0.233	-127.917***	-26.534	-178.801***	-385.888**
	(0.462)	(0.755)	(-7.135)	(-0.318)	(-6.955)	(-2.428)
Observations	1,189	1,189	1,189	1,189	1,189	1,189
R-squared	0.450	0.426	0.435	0.128	0.460	0.273
Firm Fixed Effects	No	Yes	No	Yes	No	Yes
Year Fixed Effects	No	Yes	No	Yes	No	Yes

This table presents the results on the effect of FAS 123R on option pay, vega and delta. POST is an indicator variable that equals one if the observation is after the adoption of FAS 123R, i.e., year 2005−2007, and zero otherwise. TREATMENT is an indicator variable that is equal to one if the observation belongs to the treated group and zero if the firm belongs to the control group. The control group includes firms that did not pay options to CEO prior to FAS 123R or already adopted the fair value method in or prior to 2002. TREATMENT_POST is the difference-in-differences estimate. The dependant variable of columns (1) − (2) is OPTION_PAY, i.e., the value of options scaled by the compensation in the current year. The dependant variable of columns (3) − (4) is VEGA_C, i.e., the vega in the current year. The dependant variable of columns (5) − (6) is DELTA_C, i.e., the delta in the current year. All other variables are defined in the Appendix A. Robust t-statistics are in parentheses and standard errors are clustered at the firm level. *, **, and *** denote statistical significance (two tailed) at the 10%, 5%, and 1% levels, respectively.

Fig. 1. The time trends in debt maturity pre- and post- FAS 123R



We plot the average of LMAT and LMAT_WT from 2001 to 2007 for both the treated and control groups in the upper and bottom figure, respectively. LMAT is the logarithm of the equal-weighted average maturity of a firm's debt issues in a given year. LMAT_WT is the logarithm of the issue size-weighted average maturity of a firm's debt issues in a given year. The pre-FAS 123R period is 2003−2004 and the post-FAS 123R period is 2005−2007. The control group contains firms that did not pay options to CEO prior to FAS 123R or adopted the fair value method in or before 2002, and the treated group contains the remaining sample firms.

Table 3: Difference-in-differences Panel Regressions: The effect of FAS 123R on Debt Maturity

VARIABLES	LMAT			LMAT_WT		
	(1)	(2)	(3)	(4)	(5)	(6)
TREATMENT		-0.146**			-0.144**	
		(-2.444)			(-2.508)	
POST		-0.066			-0.077	
		(-0.840)			(-1.013)	
TREATMENT_POST	0.168**	0.150**	0.147**	0.160**	0.144**	0.142**
	(2.353)	(2.084)	(1.976)	(2.329)	(2.098)	(1.981)
LSIZE		0.034	-1.390***		0.026	-1.281***
		(0.230)	(-3.526)		(0.179)	(-3.260)
LSIZE2		-0.001	0.082***		-0.001	0.074***
		(-0.138)	(3.457)		(-0.175)	(3.185)
LEVERAGE		0.498***	0.983***		0.591***	1.043***
		(2.588)	(2.998)		(3.234)	(3.081)
ASSET_MAT		0.005**	-0.004		0.005**	-0.003
		(2.537)	(-0.592)		(2.491)	(-0.460)
OWN		-0.001	0.270		-0.002	0.038
		(-0.002)	(0.269)		(-0.008)	(0.050)
MB		0.014	0.126**		0.024	0.148**
		(0.525)	(2.058)		(0.918)	(2.250)
TERM		-0.077***	0.010		-0.081***	0.023
		(-3.251)	(0.176)		(-3.470)	(0.422)
REG_DUM		-0.101			-0.097	
		(-1.400)			(-1.501)	
ABNEARN		-0.151	-0.168		-0.158	-0.181
		(-1.167)	(-1.112)		(-1.211)	(-1.171)
STD_RET		-0.788	-1.208		-0.820	-1.280
		(-1.053)	(-1.141)		(-1.184)	(-1.235)
RATE_DUM		0.005	0.021		0.004	0.002
		(0.115)	(0.173)		(0.104)	(0.019)
ZSCORE_DUM		-0.014	-0.032		0.000	0.006
		(-0.201)	(-0.389)		(0.000)	(0.072)
Constant	1.610***	1.671**	7.043***	1.587***	1.716***	6.519***
	(57.381)	(2.477)	(4.205)	(57.752)	(2.618)	(3.895)
Observations	1,189	1,189	1,189	1,189	1,189	1,189
R-squared	0.114	0.106	0.138	0.116	0.107	0.140
Firm Fixed Effects	Yes	No	Yes	Yes	No	Yes
Year Fixed Effects	Yes	No	Yes	Yes	No	Yes

This table presents the results on the effect of FAS 123R on debt maturity. POST is an indicator variable that equals one if the observation is after the adoption of FAS 123R, i.e., year 2005−2007, and zero otherwise. TREATMENT is an indicator variable that is equal to one if the observation belongs to the treated group and zero if the firm belongs to the control group. The control group includes firms that did not pay options to CEO during pre-FAS 123R period or already adopted the fair value method in or prior to 2002. TREATMENT_POST is the difference-in-differences estimate. The dependant variable of columns (1)−(3) is LMAT, i.e., the logarithm of the equal-weighted average maturity of debt issues. The dependent variable of columns (4)−(6) is LMAT_WT, i.e., the logrithm of the issue size-weighted average maturity of debt issues. All other variables are defined in the Appendix A. Robust t-statistics are in parentheses and standard errors are clustered at the firm level. *, **, and *** denote statistical significance (two tailed) at the 10%, 5%, and 1% levels, respectively.

Table 4: First-differencing Regressions: The effect of FAS 123R on Debt Maturity

VARIABLES	Δ LMAT		Δ LMAT_WT	
	(1)	(2)	(3)	(4)
TREATMENT	0.187***	0.178**	0.182***	0.181**
	(2.876)	(2.278)	(2.914)	(2.411)
Δ LSIZE		-1.271**		-1.388***
		(-2.373)		(-2.633)
Δ LSIZE2		0.078**		0.083***
		(2.504)		(2.732)
Δ LEVERAGE		0.117		0.102
		(0.218)		(0.185)
Δ ASSET_MAT		-0.004		-0.005
		(-0.403)		(-0.543)
Δ OWN		0.069		-0.292
		(0.063)		(-0.324)
Δ MB		0.068		0.115
		(0.753)		(1.341)
Δ TERM		-0.015		0.002
		(-0.147)		(0.019)
Δ ABNEARN		-0.131		-0.409
		(-0.363)		(-1.298)
Δ STD_RET		-0.502		-1.164
		(-0.264)		(-0.638)
Δ RATE_DUM		0.369		0.347
		(1.283)		(1.337)
Δ ZSCORE_DUM		-0.308*		-0.230
		(-1.869)		(-1.430)
LSIZE		-0.366*		-0.298
		(-1.675)		(-1.413)
LSIZE2		0.022*		0.017
		(1.791)		(1.441)
LEVERAGE		-1.247***		-1.357***
		(-3.235)		(-3.593)
ASSET_MAT		0.005		0.003
		(1.189)		(0.785)
OWN		-0.649		-0.517
		(-0.956)		(-0.740)
MB		-0.017		-0.004
		(-0.315)		(-0.073)
TERM		0.073		0.067
		(0.688)		(0.660)
REG_DUM		-0.064		-0.152
		(-0.267)		(-0.626)

ABNEARN		0.724		0.418
		(1.010)		(0.625)
STD_RET		0.975		0.071
		(0.533)		(0.040)
RATE_DUM		0.001		0.001
		(0.008)		(0.015)
ZSCORE_DUM		-0.153		-0.172
		(-1.006)		(-1.250)
Constant	0.061	1.605	0.056	1.497
	(1.062)	(1.627)	(1.017)	(1.549)
Observations	402	402	402	402
R-squared	0.021	0.249	0.022	0.259
Industry Fixed Effects	Yes	Yes	Yes	Yes

This table presents the first-differencing results on the effect of FAS 123R on debt maturity, where for each firm we average its characteristics in pre- and post-FAS 123R period. TREATMENT is an indicator variable that is equal to one if the observation belongs to the treated group and zero if the firm belongs to the control group. The control group includes firms that did not pay options to CEO during the pre-FAS 123R period or already adopted the fair value method in or before 2002. The dependant variable of columns (1)−(2) is Δ LMAT, i.e., the change in the logarithm of the equal-weighted average maturity of debt issues from pre- to post- FAS 123R period. The dependent variable of columns (3)−(4) is Δ LMAT_WT, i.e., the change in the logarithm of the issue size-weighted average maturity of debt issues from pre- to post-FAS 123R. For each control variable, we include both its level in the pre-FAS 123R period and its change across the two periods. The variables are defined in the Appendix A. Robust t-statistics are in parentheses and standard errors are clustered at the firm level. *, **, and *** denote statistical significance (two tailed) at the 10%, 5%, and 1% levels, respectively.

Table 5: Placebo Tests (2000−2003): The effect of FAS 123R on Debt Maturity

	New Treated and Control Firms		Old Treated and Control Firms	
VARIABLES	LMAT	LMAT_WT	LMAT	LMAT_WT
	(1)	(2)	(3)	(4)
TREATMENT_POST	-0.067	-0.003	0.012	0.053
	(-0.720)	(-0.035)	(0.116)	(0.532)
LSIZE	0.375	0.324	0.938	0.942
	(0.880)	(0.831)	(1.447)	(1.622)
LSIZE2	-0.000	0.001	-0.028	-0.030
	(-0.019)	(0.051)	(-0.746)	(-0.884)
LEVERAGE	0.316	0.264	0.652	0.514
	(0.881)	(0.763)	(1.356)	(1.107)
ASSET_MAT	0.030***	0.027***	0.027***	0.024**
	(3.240)	(2.919)	(2.607)	(2.283)
OWN	1.831	1.608	0.681	0.664
	(1.461)	(1.310)	(0.487)	(0.481)
MB	-0.031	-0.043	-0.036	-0.049
	(-0.491)	(-0.744)	(-0.435)	(-0.684)
TERM	0.095*	0.099**	0.140*	0.135**
	(1.713)	(2.045)	(1.901)	(2.301)
ABNEARN	-0.099	-0.067	-0.342**	-0.389***
	(-1.110)	(-0.768)	(-2.431)	(-2.793)
STD_RET	1.753*	1.422	2.079	1.775
	(1.743)	(1.433)	(1.646)	(1.428)
RATE_DUM	0.209	0.172	0.418***	0.339***
	(1.579)	(1.430)	(2.858)	(2.834)
ZSCORE_DUM	-0.090	-0.087	-0.057	-0.041
	(-1.026)	(-1.055)	(-0.452)	(-0.374)
Constant	-2.207	-1.803	-5.182*	-4.990**
	(-1.228)	(-1.082)	(-1.895)	(-2.003)
Observations	1,437	1,437	885	885
R-squared	0.043	0.039	0.058	0.060
Firm Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes

This table presents the placebo tests during 2000−2003 period using difference-in-differences approach. We use 2000−2001 as the pre-event period and 2002−2003 as the post-event period. In columns (1) and (2), we define control firms that did not grant options to CEOs in the 2000−2001 period. In columns (3) and (4), we use the same treated and control firms as in Table 3. LMAT is the logarithm of the equal-weighted average maturity of a firm's debt issues in a given year. LMAT_WT is the logarithm of the issue size-weighted average maturity of a firm's debt issues in a given year. We use the same control variables as in Table 3. Robust t-statistics are in parentheses and standard errors are clustered at the firm level. *, **, and *** denote statistical significance (two tailed) at the 10%, 5%, and 1% levels, respectively.

Table 6: Placebo Tests (2006−2007): The effect of FAS 123R on Debt Maturity

	New Treated and Control Firms		Old Treated and Control Firms	
VARIABLES	LMAT	LMAT_WT	LMAT	LMAT_WT
	(1)	(2)	(3)	(4)
TREATMENT_POST	-0.029	-0.057	-0.132	-0.218
	(-0.217)	(-0.435)	(-0.633)	(-1.075)
LSIZE	0.353	-0.620	-0.696	-1.702
	(0.257)	(-0.452)	(-0.277)	(-0.721)
LSIZE2	-0.036	0.018	-0.020	0.037
	(-0.414)	(0.215)	(-0.129)	(0.262)
LEVERAGE	0.076	0.253	1.927	1.806
	(0.067)	(0.231)	(1.041)	(1.014)
ASSET_MAT	-0.000	0.003	-0.016	-0.015
	(-0.010)	(0.208)	(-0.412)	(-0.418)
OWN	-3.525	-3.704	-7.026*	-6.920*
	(-1.230)	(-1.326)	(-1.687)	(-1.718)
MB	0.121	0.188	0.607	0.642
	(0.457)	(0.737)	(1.262)	(1.437)
TERM	-0.253	-0.177	-0.325	-0.282
	(-0.899)	(-0.709)	(-1.050)	(-1.013)
ABNEARN	0.498	0.489	0.523	0.562
	(1.306)	(1.332)	(1.207)	(1.322)
STD_RET	-1.613	-0.801	-7.369	-6.718
	(-0.551)	(-0.285)	(-1.537)	(-1.459)
RATE_DUM	-0.303**	-0.252	-0.112	-0.056
	(-2.012)	(-1.386)	(-0.588)	(-0.323)
ZSCORE_DUM	0.119	0.056	0.300*	0.233*
	(0.989)	(0.479)	(1.959)	(1.687)
Constant	1.602	5.630	8.920	13.125
	(0.281)	(0.984)	(0.822)	(1.272)
Observations	600	600	401	401
R-squared	0.036	0.040	0.088	0.103
Number of gvkey	479	479	312	312
Firm Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes

This table presents the placebo tests during 2006−2007 period using difference-in-differences approach. We use 2006 as the pre-event period and 2007 as the post-event period. In columns (1) and (2), we define control firms that did not grant options to CEOs in 2006. In columns (3) and (4), we use the same treated and control firms as in Table 3. LMAT is the logarithm of the equal-weighted average maturity of a firm's debt issues in a given year. LMAT_WT is the logarithm of the issue size-weighted average maturity of a firm's debt issues in a given year. We use the same control variables as in Table 3. Robust t-statistics are in parentheses and standard errors are clustered at the firm level. *, **, and *** denote statistical significance (two tailed) at the 10%, 5%, and 1% levels, respectively.

Table 7: Alternative Explanations: The effect of FAS 123R on Debt Maturity

VARIABLES	(1) LMAT	(2) LMAT_WT	(3) LMAT	(4) LMAT_WT	(5) LMAT	(6) LMAT_WT
TREATMENT_POST	0.148**	0.143**	0.168*	0.139*	0.210***	0.206***
	(1.985)	(1.996)	(1.908)	(1.656)	(2.666)	(2.681)
CDS_TRADING	-0.035	-0.048				
	(-0.312)	(-0.428)				
SECU_ACTIVE			0.089	0.082		
			(1.301)	(1.257)		
LSIZE	-1.395***	-1.289***	-1.020**	-0.751	-0.702	-0.664
	(-3.525)	(-3.261)	(-2.105)	(-1.597)	(-1.374)	(-1.303)
LSIZE2	0.082***	0.075***	0.064**	0.046*	0.050	0.047
	(3.451)	(3.177)	(2.225)	(1.672)	(1.637)	(1.565)
LEVERAGE	0.979***	1.038***	1.432***	1.490***	1.052***	1.086***
	(2.982)	(3.059)	(3.896)	(4.086)	(2.885)	(2.917)
ASSET_MAT	-0.004	-0.003	0.001	0.004	0.000	0.003
	(-0.609)	(-0.491)	(0.090)	(0.490)	(0.048)	(0.414)
OWN	0.265	0.031	0.979	0.429	-0.366	-0.480
	(0.264)	(0.041)	(0.652)	(0.395)	(-0.453)	(-0.675)
MtB	0.126**	0.148**	0.120*	0.146**	0.099	0.116*
	(2.057)	(2.253)	(1.734)	(2.089)	(1.508)	(1.800)
TERM	0.010	0.023	0.048	0.063	0.026	0.029
	(0.185)	(0.435)	(0.702)	(0.969)	(0.405)	(0.479)
ABNEARN	-0.168	-0.181	0.097	0.102	-0.221	-0.269
	(-1.111)	(-1.170)	(0.606)	(0.659)	(-1.314)	(-1.580)
STD_RET	-1.209	-1.281	0.055	-0.359	-1.690	-1.894*
	(-1.141)	(-1.234)	(0.038)	(-0.257)	(-1.544)	(-1.764)
RATE_DUM	0.021	0.002	0.267*	0.218	0.118	0.051
	(0.174)	(0.020)	(1.724)	(1.519)	(0.654)	(0.308)
ZSCORE_DUM	-0.034	0.003	0.066	0.122	-0.044	-0.013
	(-0.412)	(0.034)	(0.696)	(1.486)	(-0.462)	(-0.147)
Constant	7.095***	6.590***	4.481**	3.343*	3.425	3.197
	(4.202)	(3.907)	(2.161)	(1.655)	(1.519)	(1.420)
Observations	1,189	1,189	917	917	1,189	1,189
R-squared	0.138	0.140	0.152	0.167	0.290	0.298
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry-by-Year Fixed Effects					Yes	Yes

This table presents the robustness of the effects of FAS 123R on debt maturity given alternative explanations. POST is an indicator variable that equals one if the observation is after the adoption of FAS 123R, i.e., year 2005−2007, and zero otherwise. TREATMENT is an indicator variable that is equal to one if the observation belongs to the treated group and zero if the firm belongs to the control group. The control group includes firms that did not pay options to CEO during the pre-FAS 123R period or already adopted the fair value method in or prior to 2002. TREATMENT_POST is the difference-in-differences estimate. CDS_TRADING is an indicator variable that equals one if the firm has quoted CDS contracts on its debt during year t, and zero otherwise. SECU_ACTIVE is an indicator variable that equals one if firm has a lead bank lender in year t belonging to Top 10 securitization-active banks ranked by Nadauld and Weisbach (2012), and zero otherwise.The dependant variable LMAT is the logarithm of the equal-weighted average maturity of debt issues. LMAT_WT is the logarithm of the issue size-weighted average maturity of debt issues. All other variables are defined in Appendix A. Robust t-statistics are in parentheses and standard errors are clustered at the firm level. *, **, and *** denote statistical significance (two tailed) at the 10%, 5%, and 1% levels, respectively.

Table 8: An Alternative Approach to Address Lack of a Control Group: Cross-sectional Variations of the Effect of FAS 123R on Debt Maturity

Panel A: Regression Results (Observations: 986)

	(1)	(2)	(3)	(4)
VARIABLES	LMAT	LMAT_WT	LMAT	LMAT_WT
LNOPTVAL_POST	0.021**	0.019**		
	(2.116)	(2.046)		
LNOPTNUM_POST			0.028**	0.024*
			(2.026)	(1.845)

Panel B: Pre and Post FAS 123R Effects (Observations 986)

	(1)	(2)	(3)	(4)
VARIABLES	LMAT	LMAT_WT	LMAT	LMAT_WT
LNOPTVAL_2003	0.003	-0.002		
	(0.205)	(-0.156)		
LNOPTVAL_2005	0.024*	0.024*		
	(1.871)	(1.949)		
LNOPTVAL_2006	0.034**	0.024		
	(2.142)	(1.619)		
LNOPTVAL_2007	0.002	-0.005		
	(0.120)	(-0.283)		
LNOPTNUM_2003			0.001	-0.005
			(0.070)	(-0.284)
LNOPTNUM_2005			0.032*	0.031*
			(1.847)	(1.869)
LNOPTNUM_2006			0.039*	0.024
			(1.753)	(1.152)
LNOPTNUM_2007			0.005	-0.006
			(0.216)	(-0.236)

This table presents the regression results on effects of FAS 123R on debt maturity with an alternative approach to address the problem of lacking a control group. POST is an indicator variable that equals one if the observation is after the adoption of FAS 123R, i.e., year 2005−2007, and zero otherwise. LNOPTVAL is logarithm of the value of the CEO option grants in 2002. LNOPTNUM is logarithm of the number of CEO option grants in 2002. LNOPTVAL_POST (LNOPTNUM_POST) is estimate of interest capturing the cross-sectional variation effect of FAS 123R on debt maturity. LNOPTVAL_YEAR (LNOPTNUM_YEAR), where YEAR= $2003, 2005, 2006, 2007$, is the product of LNOPTVAL ((LNOPTNUM) and year dummy, capturing the effect of FAS 123R on debt maturity in a particular year relative to the benchmark year 2004. The dependant variable LMAT is the logarithm of the equal-weighted average maturity of debt issues. LMAT_WT is the logrithm of the issue size-weighted average maturity of debt issues. Other control variables are the same as Column (3) and (6) in Table 3, which are omitted in this table. Robust t-statistics are in parentheses and standard errors are clustered at the firm level. *, **, and *** denote statistical significance (two tailed) at the 10%, 5%, and 1% levels, respectively.

Table 9: Triple Difference Regressions: Change in Vega and Debt Maturity

VARIABLES	LMAT	LMAT_WT
	(1)	(2)
TREATMENT_POST	0.118*	0.118*
	(1.667)	(1.712)
ΔVEGA_POST	-0.001	-0.001
	(-1.189)	(-1.053)
ΔVEGA_TREATMENT_POST	0.001*	0.001
	(1.724)	(1.597)
LSIZE	-1.419***	-1.299***
	(-3.575)	(-3.281)
LSIZE2	0.084***	0.076***
	(3.529)	(3.230)
LEVERAGE	0.935***	1.000***
	(2.871)	(2.969)
ASSET_MAT	-0.004	-0.003
	(-0.544)	(-0.406)
OWN	0.372	0.125
	(0.361)	(0.159)
MB	0.118*	0.140**
	(1.928)	(2.115)
TERM	0.009	0.022
	(0.156)	(0.393)
ABNEARN	-0.178	-0.189
	(-1.164)	(-1.214)
STD_RET	-1.331	-1.388
	(-1.303)	(-1.374)
RATE_DUM	0.016	-0.003
	(0.128)	(-0.021)
ZSCORE_DUM	-0.031	0.007
	(-0.384)	(0.093)
Constant	7.138***	6.566***
	(4.269)	(3.923)
Observations	1,189	1,189
R-squared	0.146	0.147
Firm Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes

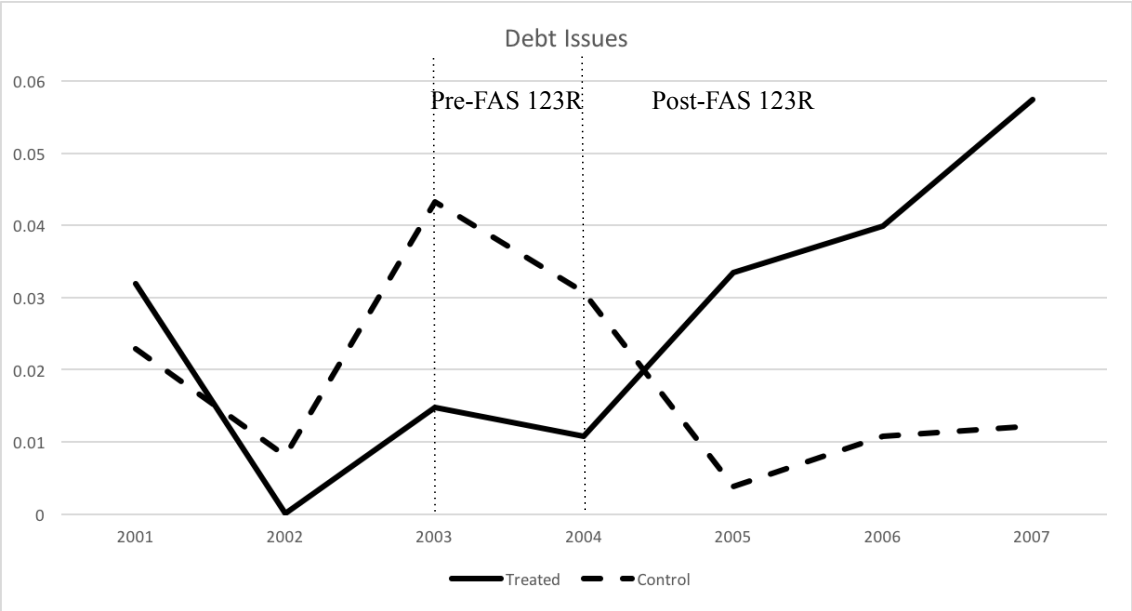
This table presents the results on whether the effect of FAS 123R on debt maturity is stronger in firms with larger drops in portfolio vega from pre- to post- event. POST is an indicator variable that equals one if the observation is after the adoption of FAS 123R, i.e., year 2005−2007, and zero otherwise. TREATMENT is an indicator variable that is equal to one if the observation belongs to the treated group and zero if the firm belongs to the control group. The control group includes firms that did not pay options to CEO in the pre-FAS 123R period or already adopted the fair value method in or prior to 2002. ΔVEGA is the difference in the portfolio vega between pre- and post- FAS 123R. ΔVEGA_TREATMENT_POST is the triple difference estimate. The dependant variable of Column (1) is LMAT, i.e., the logarithm of the equal-weighted average maturity of debt issues. The dependent variable of Column (2) is LMAT_WT, i.e., the logarithm of the issue size-weighted average maturity of debt issues. All other variables are defined in the Appendix A. Robust t-statistics are in parentheses and standard errors are clustered at the firm level. *, **, and *** denote statistical significance (two tailed) at the 10%, 5%, and 1% levels, respectively.

Table 10: Robustness Tests: Controlling for Delta

VARIABLES	(1) LMAT	(2) LMAT_WT
TREATMENT_POST	0.147**	0.142**
	(1.968)	(1.974)
LDELTA	-0.032	-0.028
	(-1.173)	(-1.055)
LSIZE	-1.360***	-1.255***
	(-3.428)	(-3.172)
LSIZE2	0.081***	0.074***
	(3.447)	(3.180)
LEVERAGE	0.938***	1.004***
	(2.823)	(2.930)
ASSET_MAT	-0.004	-0.003
	(-0.551)	(-0.424)
OWN	0.573	0.302
	(0.531)	(0.360)
MtB	0.132**	0.154**
	(2.172)	(2.343)
TERM	0.013	0.025
	(0.226)	(0.464)
ABNEARN	-0.167	-0.180
	(-1.095)	(-1.158)
STD_RET	-1.235	-1.304
	(-1.167)	(-1.256)
RATE_DUM	0.024	0.005
	(0.201)	(0.040)
ZSCORE_DUM	-0.027	0.010
	(-0.331)	(0.127)
Constant	6.951***	6.439***
	(4.146)	(3.841)
Observations	1,189	1,189
R-squared	0.139	0.141
Firm Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes

This table reports the robustness of our results by controlling for delta. POST is an indicator variable that equals one if the observation is after the adoption of FAS 123R, i.e., year 2005−2007, and zero otherwise. TREATMENT is an indicator variable that is equal to one if the observation belongs to the treated group and zero if the firm belongs to the control group. The control group includes firms that did not pay options to CEO in the FAS 123R period or already adopted the fair value method in or prior to 2002. TREATMENT_POST is the difference-in-differences estimate. LDELTA is the logarithm of the portfolio vega. The dependant variable LMAT is the logarithm of the equal-weighted average maturity of debt issues. The dependent variable of column LMAT_WT is the logarithm of the issue size-weighted average maturity of debt issues. All other variables are defined in the Appendix A. Robust t-statistics are in parentheses and standard errors are clustered at the firm level. *, **, and *** denote statistical significance (two tailed) at the 10%, 5%, and 1% levels, respectively.

Fig. 2. The time trends in net debt issuances pre- and post- FAS 123R



In the figure, we plot the evolution of net debt issuances from 2001−2007 for both the treated and control group. The pre-FAS 123R period is 2003−2004 and the post-FAS 123R period is 2005−2007. The control group contains firms that did not pay options to CEO in the pre-FAS 123R period or adopted the fair value method in or before 2002, and the treated group contains the remaining sample firms.

Table 11: Difference-in-differences Panel Regressions: The effect of FAS 123R on net debt issuances

VARIABLES	(1) DEBTISSUE	(2) DEBTISSUE
TREATMENT_POST	0.065***	0.056***
	(3.178)	(2.828)
LSIZE		0.156***
		(4.931)
MB		-0.056***
		(-2.654)
ABNEARN		-0.041
		(-0.607)
STD_RET		-0.840**
		(-2.518)
RATE_DUM		0.103
		(1.635)
TANGIBILITY		-0.224*
		(-1.672)
ROA		-0.440**
		(-2.298)
Constant	0.022***	-1.193***
	(3.501)	(-4.235)
Observations	1,123	1,123
R-squared	0.034	0.149
Firm Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes

This table presents the results on the effect of FAS 123R on net debt issuances. POST is an indicator variable that equals one if the observation is after the adoption of FAS 123R, i.e., year 2005−2007, and zero otherwise. TREATMENT is an indicator variable that is equal to one if the observation belongs to the treated group and zero if the firm belongs to the control group. The control group includes firms that did not pay options to CEO in the pre-FAS 123R period or already adopted the fair value method in or prior to 2002. TREATMENT_POST is the difference-in-differences estimate. The dependent variable DEBTISSUE is computed as long-term debt issuance minus long-term debt reduction plus changes in current debt, scaled by the book value of assets. All the variables are defined in the Appendix A. Robust t-statistics are in parentheses and standard errors are clustered at the firm level. *, **, and *** denote statistical significance (two tailed) at the 10%, 5%, and 1% levels, respectively.

Table 12: Placebo Tests: The effect of FAS 123R on net debt issuances

	2000−2003		2006−2007	
SAMPLE	NEW	OLD	NEW	OLD
VARIABLES	DEBTISSUE	DEBTISSUE	DEBTISSUE	DEBTISSUE
TREATMENT_POST	0.037	-0.016	0.019	-0.009
	(0.792)	(-0.456)	(0.680)	(-0.214)
LSIZE	0.252***	0.252***	0.329**	0.311*
	(5.384)	(4.122)	(2.554)	(1.810)
MB	-0.059**	-0.079***	-0.157**	-0.125
	(-2.285)	(-3.394)	(-1.989)	(-1.576)
ABNEARN	-0.099**	-0.096	-0.126	-0.517***
	(-2.446)	(-1.612)	(-0.581)	(-2.632)
STD_RET	-0.938**	-0.780	0.806	-0.463
	(-2.252)	(-1.591)	(0.726)	(-0.476)
RATE_DUM	-0.012	0.052	0.083*	0.081*
	(-0.253)	(0.783)	(1.676)	(1.829)
TANGIBILITY	-0.029	-0.084	-0.950**	-0.274
	(-0.220)	(-0.497)	(-2.395)	(-0.710)
ROA	-0.292**	-0.339**	-1.355	-2.767***
	(-2.247)	(-2.131)	(-1.571)	(-2.594)
Constant	-1.868***	-1.932***	-2.264**	-2.374
	(-4.791)	(-3.714)	(-2.238)	(-1.576)
Observations	1,322	822	567	380
R-squared	0.125	0.147	0.293	0.361
Firm Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes

This table presents the placebo tests during 2000−2003 and 2006−2007 period using difference-in-differences approach. For the period from 2000 to 2003, we use 2000−2001 as the pre-event period and 2002−2003 as the post-event period. For the period from 2006 to 2007, we use 2006 as the pre-event period and 2007 as the post-event period. In Column (1) and (3), we define control firms that did not grant options to CEOs in the pre-event period. In Column (2) and (4), we use the same treated and control firms as in Table 3. TREATMENT_POST is the difference-in-differences estimate. The dependent variable DEBTISSUE is computed as long-term debt issuance minus long-term debt reduction plus changes in current debt, scaled by the book value of assets. All the variables are defined in the Appendix A. Robust t-statistics are in parentheses and standard errors are clustered at the firm level. *, **, and *** denote statistical significance (two tailed) at the 10%, 5%, and 1% levels, respectively.

Table 13: Triple Difference Regressions: Growth Opportunities and Debt Maturity

VARIABLES	LMAT	LMAT_WT
	(1)	(2)
TREATMENT_POST	-0.248	-0.179
	(-1.291)	(-1.043)
MB_POST	-0.194*	-0.156
	(-1.726)	(-1.638)
MB_TREATMENT_POST	0.252**	0.204**
	(2.149)	(2.044)
LSIZE	-1.357***	-1.253***
	(-3.511)	(-3.248)
LSIZE2	0.079***	0.072***
	(3.427)	(3.162)
LEVERAGE	0.999***	1.055***
	(3.062)	(3.130)
ASSET_MAT	-0.004	-0.004
	(-0.666)	(-0.519)
OWN	-0.038	-0.210
	(-0.042)	(-0.288)
MB	0.151**	0.170**
	(2.311)	(2.407)
TERM	0.004	0.018
	(0.072)	(0.329)
ABNEARN	-0.172	-0.185
	(-1.144)	(-1.198)
STD_RET	-1.114	-1.206
	(-1.049)	(-1.159)
RATE_DUM	0.047	0.024
	(0.385)	(0.195)
ZSCORE_DUM	-0.034	0.004
	(-0.405)	(0.055)
Constant	6.907***	6.402***
	(4.191)	(3.881)
Observations	1,189	1,189
R-squared	0.145	0.145
Number of gvkey	402	402
Firm Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes

This table presents the results on whether the effect of FAS 123R on debt maturity is stronger in firms with more growth opportunities. POST is an indicator variable that equals one if the observation is after the adoption of FAS 123R, i.e., year 2005−2007, and zero otherwise. TREATMENT is an indicator variable that is equal to one if the observation belongs to the treated group and zero if the firm belongs to the control group. The control group includes firms that did not pay options to CEO in the pre-FAS 123R period or already adopted the fair value method in or prior to 2002. MB is the average market-to-book ratio across the pre-event period 2003−2004. MB_TREATMENT_POST is the triple difference estimate. The dependant variable of Column (1) is LMAT, i.e., the logarithm of the equal-weighted average maturity of debt issues. The dependent variable of Column (2) is LMAT_WT, i.e., the logarithm of the issue size-weighted average maturity of debt issues. All other variables are defined in the Appendix A. Robust t-statistics are in parentheses and standard errors are clustered at the firm level. *, **, and *** denote statistical significance (two tailed) at the 10%, 5%, and 1% levels, respectively.

Table 14: Triple Difference Regressions: Regulated Firms and Debt Maturity

VARIABLES	LMAT	LMAT_WT
	(1)	(2)
TREATMENT_POST	0.279***	0.260***
	(3.790)	(3.647)
REG_POST	0.513***	0.466***
	(3.401)	(3.171)
REG_TREATMENT_POST	-0.301*	-0.257
	(-1.665)	(-1.472)
LSIZE	-1.252***	-1.153***
	(-3.091)	(-2.851)
LSIZE2	0.075***	0.068***
	(3.119)	(2.861)
LEVERAGE	1.107***	1.159***
	(3.270)	(3.321)
ASSET_MAT	0.000	0.001
	(0.066)	(0.126)
OWN	0.030	-0.184
	(0.030)	(-0.242)
MB	0.121*	0.143**
	(1.962)	(2.162)
TERM	0.000	0.014
	(0.005)	(0.257)
ABNEARN	-0.194	-0.205
	(-1.285)	(-1.312)
STD_RET	-0.981	-1.077
	(-0.935)	(-1.048)
RATE_DUM	0.036	0.016
	(0.305)	(0.132)
ZSCORE_DUM	-0.085	-0.044
	(-0.990)	(-0.540)
Constant	6.341***	5.866***
	(3.647)	(3.375)
Observations	1,189	1,189
R-squared	0.159	0.159
Number of gvkey	402	402
Firm Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes

This table presents the results on whether the effect of FAS 123R on debt maturity is stronger for firms from non-regulated industries. POST is an indicator variable that equals one if the observation is after the adoption of FAS 123R, i.e., year 2005−2007, and zero otherwise. TREATMENT is an indicator variable that is equal to one if the observation belongs to the treated group and zero if the firm belongs to the control group. The control group includes firms that did not pay options to CEO in the pre-FAS 123R period or already adopted the fair value method in or prior to 2002. REG is an indicator that equals one if the firm is regulated, and zero otherwise. REG_TREATMENT_POST is the triple difference estimate. The dependant variable of Column (1) is LMAT, i.e., the logarithm of the equal-weighted average maturity of debt issues. The dependent variable of Column (2) is LMAT_WT, i.e., the logrithm of the issue size-weighted average maturity of debt issues. All other variables are defined in the Appendix A. Robust t-statistics are in parentheses and standard errors are clustered at the firm level. *, **, and *** denote statistical significance (two tailed) at the 10%, 5%, and 1% levels, respectively.

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