Preemption of compliance costs and the voluntary adoption of SFAS No. 123(R)

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Abstract

Purpose – This paper aims to study a preemption proposition for the compliance costs associated with stock option expensing under SFAS 123(R) by examining whether early adopters used their discretion over option pricing model inputs to mitigate the adoption effect.

Design/methodology/approach – The paper uses a matched sample approach of firms that voluntarily adopted stock option expensing during the 2002-2004 period and similar firms that waited until the mandatory expensing. The paper empirically examines some determinants of voluntary adoption, and the changes in option pricing model inputs during the period leading to mandatory expensing.

Findings – The paper reports evidence that voluntary adopters of stock option expensing during the 2002-2004 period have used the period leading to mandatory expensing to preempt its compliance cost effect. The authors exercised their discretion by decreasing estimates for stock price volatility and time-to-maturity to preempt or minimize the reduction in earnings before mandatory adoption date.

Originality/value – Results of this paper are useful to accounting regulators in understanding the reaction of financial statement preparers to deliberations, effective dates and voluntary early adoption terms of the accounting standards setting process.

Keywords Accounting, Preemption, Pricing model, Stock options, Voluntary adoption

Paper type Research paper

1. Introduction

Accounting for employee stock options has been one of the most challenging and controversial issues the accounting profession has faced. The Financial Accounting Standards Board (FASB) added this issue to its agenda in 1984. Under APB 25, the original requirements for accounting for employee stock options used the intrinsic value method of accounting. Following these requirements, firms generally recognized compensation expense on the stock options grant date only if the quoted market price of the stock is higher than the amount an employee must pay to acquire the stock.

On June 1993, FASB issued a highly controversial Exposure Draft, "Accounting for Stock-Based Compensation", which proposed a fair value method for the valuation of granted stock options through the use of well-recognized option pricing models. The estimated value of employee stock options would become part of recognized compensation expense and reported on the face of the income statement. After coming under an enormous pressure from different constituencies, including Congress, the FASB compromised on this issue. In 1995, the FASB issued SFAS 123 "Accounting for

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Stock-Based Compensation". It allowed firms to continue using the intrinsic value method with disclosure of the *pro forma* stock option expense under the fair value method.

Virtually all of the Fortune 500 firms, except Boeing and Winn Dixie, initially opted to continue using the intrinsic value method (Robinson and Burton. 2004; Frederickson *et al.*, 2006). Following the accounting scandals of Enron and WorldCom, the USA Congress began demanding greater transparency in financial reporting and greater accountability of top management culminating in the Sarbanes–Oxley Act of 2002. In response to this new political environment, some firms announced they would voluntarily adopt fair value accounting for stock options. Ultimately, the FASB revisited this issue and revised SFAS 123. They issued SFAS 123(R) in December 2004, which required firms to recognize fair value of stock options as an expense effective from fiscal years beginning after June 15, 2005.

In anticipation of the enacting of mandatory stock option expensing late 2004, many companies preemptively decided to adopt the expensing of employee stock options during 2003 and early 2004 before the issuance of SFAS 123(R) and its effective date. Some of the determining factors of such preemptive adoption can be attributed to investors' perceptions and the anticipated cost of compliance with stock option mandatory expensing which seemed inevitable to many financial statement preparers during 2003 and early 2004 (Langer and Lev, 1993). On one hand, those voluntary adopting firms can get the benefit of being perceived by the market as firms with greater transparency and higher-quality corporate governance (Deshmukh *et al.*, 2006). On the other hand, adopting SFAS 123(R) also involved recognizing significant additional compensation expense based on the Black–Scholes option pricing model (Botosan and Plumlee, 2001). Schroeder and Schauer (2008) reported that the expensing of stock options under SFAS 123(R) had a material impact on firms' net income. Because the choice of inputs to the pricing model results in a wide range of possible estimated stock option fair values and recognized compensation expense (Coller and Higgs, 1997), management might be inclined to use its discretion over these estimated inputs to preempt the compliance cost and minimize the effect of stock option expensing on their financial statements (Hirst *et al.*, 2005).

The main objective of this paper is to examine and detect any preemption behavior by firms voluntarily choosing to expense employee stock options during the 2002-2004 period by using their discretion over some estimated inputs to the stock option pricing model to mitigate the effect of stock option expensing during the period leading to the mandatory expensing effective date. We propose the preemption hypothesis in which management is motivated to use its discretion to reduce compliance costs associated with the adoption of this income-reducing accounting change. In the case of voluntary adoption of SFAS 123(R), we examine whether managers use discretion over the four estimated inputs to the Black–Scholes option pricing model to reduce the amount of compensation expense recognized on the income statement. This paper expands the literature on compliance costs associated with the voluntary adoption of SFAS 123(R). We examine the period before and after the voluntary adoption wave of 2002-2004 for evidence that management used its discretion to manage any of the four disclosed Black–Scholes model inputs, and examine any evidence of systematic change in these model inputs in the direction that would minimize the fair value of stock options and compensation expense.

The remainder of the paper is organized as follows. The next section reviews the literature on incentives for voluntary adoption of accounting changes. The third section describes the preemption concept and develops the hypotheses. The fourth section describes the data and empirical methods. The fifth section presents and discusses our results. The final section concludes the paper.

2. Literature review

2.1 Incentives for voluntary adoption

The accounting literature has proposed numerous incentives for adopting accounting changes voluntarily prior to their mandatory effective dates. Following Langer and Lev (1993), we classify these incentives for voluntary adoption into investor perception or compliance costs. Investor perception involves management attempts to change investor's expectations. Amir and Ziv (1997a, 1997b) develop a model of voluntary adoption for SFAS 106 and suggested that firms adopt changes in accounting regulation early if the effects are favorable. They assume that voluntary adoption is a means by which management can signal its private information about the effects of this change on the future prospects of the firm. Consistent with this model, firms demonstrating earnings increases in association with the accounting changes are more likely to be early adopters (Balsam *et al.*, 1995; Langer and Lev, 1993; Sami and Welsh, 1992). Both Amir and Livnat (1996) and Balsam *et al.* (1995) report that favorable liability changes may also provide creditable signals for voluntary adopters.

Consistent with the investor perception incentive, the market has closely followed FASB's deliberations on stock-based compensation accounting. Significant abnormal returns have been documented around the release of the Exposure Draft in June 1993 and the release of SFAS 123 in October 1995 (Espahbodi *et al.*, 2002; Dechow *et al.*, 1996). Aboody *et al.* (2004) finds the degree of information asymmetry to be greater among voluntary adopters of SFAS 123(R).Robinson and Burton (2004) observed a cumulative abnormal return of 0.53 per cent (significant at the 0.05 level) for voluntary adopters of SFAS 123(R) over a three-day event window (days −1 to 1).

On the issue of recognition versus disclosure, the market reaction to FASB's Exposure Draft and subsequent deliberations strongly suggests that "disclosure is no substitute for recognition" (Espahbodi *et al.*, 2002). Davis-Friday *et al.* (2004) investigated disclosures associated with retiree benefits under SFAS 106 and found disclosures to be less reliable than recognition of post-retirement benefit liabilities or for pension liabilities. Frederickson *et al.* (2006) found decision makers interpreted income statements with mandated recognition of stock option expense as more reliable than voluntary recognition or voluntary disclosure. Viger *et al.* (2008) examined the credit decision of bank loan officers and found that loan officers failed to incorporate the information from the voluntary disclosure in their analysis[1]. Loan officers assigned higher risk to firms reporting lower income due to stock option expense recognition and were less willing to grant them the requested loan. Niu and Xu (2009) reported evidence that expensing stock options – compared with the *pro forma* disclosure – increases the perceived quality of firm's financial reporting and has some incremental effect on the market value of the firm.

The second category of incentives for voluntary adoption is compliance costs (Langer and Lev, 1993). Watts and Zimmerman (1978) proposed that larger firms were more likely to be voluntary adopters of income-decreasing changes because they can

absorb information production costs associated with the accounting change. Smaller firms are more likely to be voluntary adopters of income-increasing accounting changes. Sami and Welsh (1992) provide empirical support for compliance costs being a consideration in the voluntary adoption of SFAS 87. They found that big companies with large and fully funded pension plans were more likely to early adopt SFAS 87. Holthausen and Leftwich (1983) reviewed the accounting change literature and concluded that both size and leverage were important proxies for compliance costs. Size is a proxy for political visibility and leverage is a proxy for contracting and monitoring costs. With respect to the issue of stock compensation expense, Aboody *et al.* (2004) found that voluntary adopters of SFAS 123(R) were significantly larger than control firms.

Early adoption of mandatory accounting changes has been found to follow some adoption pattern for several mandatory accounting changes (Balsam *et al.*, 1995). Companies tended to adopt equity-increasing changes early. Equity-decreasing changes were adopted based on how such changes would affect their reported earnings and return on assets. In the case of pension accounting, for example, Tung and Weygandt (1994) reported that most of the firms that adopted SFAS 87 early had a positive effect on reported earnings. Early adopters were also more likely to have higher leverage and lower interest coverage ratio before the adoption. They concluded that managers used early adoption to relax debt covenants. Both Gujarathi and Hoskin (1992) and Simon and Costigan (1996) found that early adoption of SFAS 96 was more likely when it resulted in increased earnings. Amir and Livnat (1996) also reported that early adopters of SFAS 106 chose to recognize the income-reducing cumulative effect of post-retirement benefits in the year of the adoption (big bath) rather than prorate it over a number of years.

Management has also taken action to minimize the exercise price of stock options by selecting a favorable grant date. Under the intrinsic value method, the market value of common stock on the grant date becomes the exercise price for stock options. Yermack (1997) and Aboody and Kasznik (2000) document that managers tend to time the stock option grants so they occur before the release of favorable information or after the release of unfavorable information. Lie (2005) finds negative abnormal returns prior to the grant and positive abnormal returns after it. Chauvin and Shenoy (2001) also demonstrate stock price decreases in the period immediately before the grant date.

Under SFRS 123(R), the fair value of stock options are generally determined using the Black–Scholes model based on four estimated inputs: risk-free interest rate, time-to-maturity, stock price volatility and dividend yield (Grinblatt and Titman, 2002). It is widely recognized that different methods of estimating the Black–Scholes model inputs could lead to large and significant differences in compensation expense (Coller and Higgs, 1997), and that stock option pricing is most sensitive to changes in factors that affect stock price or stock price volatility(Core and Guay, 2002).

Results of the empirical analysis of management's discretion in estimating option pricing model inputs have been mixed. Balsam *et al.* (2003) found no support for the use of Black–Scholes model inputs to manage stock option expense disclosed under SFAS 123. Robinson and Burton (2004) found dividend yield significantly higher and stock price volatility significantly lower in voluntary adopters of SFAS 123(R) as compared to control firms. Aboody *et al.* (2006) calculate fair value of stock options by strict application of the provisions recommended in SFAS 123(R) and find that managers systematically understate compensation expense. Bartov *et al.* (2007) focus on stock

price volatility and argue that management uses its discretion in estimating stock price volatility to understate compensation expense. Johnston (2006) collected the disclosed Black–Scholes model inputs for a sample of voluntary adopters and control firms, and found that voluntary adopters managed compensation expense downward. However, in a similar study, Hodder *et al.* (2006) found that voluntary adopters reported higher fair values and compensation expense than control firms.

Prior empirical research on the voluntary adoption of stock option expensing has focused on management's use of its discretion in estimating the option pricing model inputs in the year of the voluntary adoption and/or the year prior to it. In this paper, we introduce the preemption hypothesis and examine the voluntary adoption as part of a preemption effort to mitigate the effect of mandatory expensing by exercising management's discretion over the option pricing model inputs during the years leading to the mandatory expensing effective date. The paper tracks management choices of option pricing model inputs before the year of voluntary adoption through the mandatory expensing year to examine whether firms used the period leading to mandatory expensing as a preemption period to smooth out the effect of mandatory expensing on their financial statements.

2.2 The preemption incentive for voluntary adoption

Prior literature suggests that firms may use the voluntary adoption and the transition period before the mandatory effective date to mitigate adverse effects of the new accounting rules on their financial statements. In other words, firms may use the voluntary adoption as a preemption tool to set the stage for the mandatory adoption and manage the initial effect of this accounting change. One of the criticisms of SFAS 123(R) was that the Standard's Exposure Draft provided managers with the opportunity to manipulate fair value estimates to preempt the effect of recognizing stock option expense (Hirst *et al.*, 2005). Prior empirical research has shown that management used its discretion to underestimate option fair value (Aboody *et al.*, 2006), and that was especially true with regard to the stock price volatility estimates (Bartov *et al.*, 2007).

Because it was commonly recognized during 2003 and early 2004 that mandatory expensing of stock options is inevitable, we expect that firms voluntarily adopting to expense their stock options may use the adoption decision as part of a preemption effort to smooth out the effect of the expected mandatory expensing during the voluntary adoption year and the years leading to that mandatory expensing compared with the year(s) prior to the voluntary adoption. Therefore, the paper examines the following two null hypotheses:

H_{01}. Managers do not use their discretion to minimize *pro forma* stock option expense disclosed under SFAS 123.

H_{02}. Managers do not use their discretion to minimize stock option compensation expense after their voluntary adoption of SFAS 123(R).

3. Data and method

Our study includes 215 companies that announced voluntary adoption of SFAS 123(R) during the years 2002-2004. Sample firms were initially identified using a list of 576 firms that announced their voluntary adoption of stock option expensing during the 2002-2004 period which was published by the former Bear Stearns. The final study

sample includes only the public firms with the required financial data and the disclosed inputs to the stock option pricing model available in their annual reports for the study periods. Control firms were chosen as a matching sample for expensing firms to control for any real economic effects on the adoption decision (Cohen *et al.*, 2008). Control firms were identified from the same four-digit SIC code industry. Each control firm granted employee stock options every year between 2001 and 2007, and continued to follow the *pro forma* disclosure for employee stock option expense until the mandatory effective date of SFAS 123(R). This helps to avoid any measurement or classification errors resulting from any late voluntary adoption of stock option expensing.

Table I summarizes voluntary adopters by year and two-digit SIC industry code. Voluntary adopters are clustered both by year and by industry. Eighty per cent (171 of 215) of the voluntary adoptions in the study sample occurred in 2003. The timing of the voluntary adoptions suggests management might be responding to the political environment in the wake of the Enron and WorldCom scandals by taking actions to demonstrate higher-quality corporate governance by voluntarily increasing the transparency of their financial statements (Deshmukh *et al.*, 2006). Voluntary adoption announcements are also clustered in the financial services sector (SIC 60–69) during 2002 and 2003, which suggests that this sector of the economy might have more to gain from increased financial reporting transparency.

Table II summarizes basic descriptive statistics of both voluntary adopters and control firms. The Black–Scholes model inputs (risk-free interest rate, stock price volatility, time-to-maturity and dividend yield) used by managers to estimate fair value of stock options were hand-gathered from the 10-K footnote disclosures for years 2001through 2007 for both sample and control firms. To control for exogenous factors in this study, five control variables are used: size, book-to-market ratio, return on assets, debt-to-assets ratio and financial need (Dechow *et al.*, 1996; Balsam *et al.*, 1995).

Univariate analysis of these nine variables consists of examining the mean differences between the voluntary adopters and control firms by year and in total. The control variables were drawn from Research Insight (North American). Size is measured using the natural log of the market value of equity (MKVAL). Book-to-market ratio is the book value of equity (CEQ) divided by the market value of equity. Return on assets is determined as income before extraordinary items available to common stocks (IBCOM) divided by total assets (AT) and expressed as a percentage. Debt-to-asset ratio is determined as total liabilities (DT) divided by total assets and expressed as a percentage. Financial need is free cash flow divided by total assets. Free cash flow is determined as operating activities-net cash flow (OANCF) less total dividends (DV) less capital expenditure (CAPX) where these items were all drawn from the statement of cash flows.

Two multivariate analyses are conducted. To examine questions about preemption of potential compliance costs, we develop a cross-sectional logistic regression model [equation (1)] based on the four Black–Scholes model inputs and track these estimates year-by-year for the period between 2000 and 2007, which included years prior to and subsequent to the voluntary adoption year as well as the voluntary adoption year itself. Our second analysis develops a logistic regression [equation (2)] that includes other control variables that might affect the company's decision of voluntary adoption. The role of political costs in the decision to adopt is captured with size and debt-to-assets

SIC code	Description	2002	2003	2004
13	Oil and gas extraction	1	4	0
20	Food and kindred products	1	4	0
23	Apparel and other textile products	0	1	0
24	Lumber and wood products	1	1	0
25	Furniture and fixtures	0	2	0
27	Printing and publishing	0	2	1
28	Chemicals and allied products	0	11	1
29	Petroleum and coal products	0	3	0
30	Rubber and misc. plastics products	1	0	0
33	Primary metals industries	0	1	0
34	Fabricated metal products	0	2	0
35	Industrial machinery and equipment	0	4	0
36	Electronic and other electric equipment	1	4	0
37	Transportation equipment	0	4	0
38	Instruments and related products	0	1	0
39	Miscellaneous manufacturing industries	0	3	0
42	Trucking and warehousing	0	2	1
45	Transportation by air	0	1	0
48	Communications	3	3	0
49	Electric, gas, and sanitary services	1	6	0
50	Wholesale trade–durable goods	0	4	0
51	Wholesale trade–nondurable goods	1	2	0
52	Building materials and garden supplies	0	2	0
53	General merchandise stores	0	3	0
54	Food stores	0	1	0
58	Eating and drinking places	1	1	0
59	Miscellaneous retail	1	3	1
60	Depository institutions	12	33	4
61	Nondepository institutions	0	3	0
62	Security and commodity brokers	0	5	0
63	Insurance carriers	3	24	0
64	Insurance agents, brokers, and service	0	1	0
65	Real estate	1	0	0
67	Holding and other investment offices	7	17	0
70	Hotels and other lodging places	0	1	0
72	Personal services	0	0	1
73	Business services	0	5	1
78	Motion pictures	0	2	0
79	Amusement and recreation services	0	1	0
80	Health services	2	2	0
87	Engineering and management services	0	2	0
Total		37	171	10

Table I.
Voluntary adopters of SFAS 123(R) by SIC code and year of adoption

ratio. The remaining control variables describe the financial condition of the firm which may have had a role in facilitating or restricting the decision to adopt.

To test the two hypotheses for manager's attempt to preempt the effects of SFAS 123(R) stock option expense, we examine equation (1) for each year from 2000 to 2007 separately and for all years combined. Significant negative coefficients for VOL, RF or

Table II. Descriptive statistics

	Risk-free rate (%)	Stock price volatility (%)	Time-to-maturity (years)	Dividend yield (%)	Size ($ millions)	Book-to-market ratio	Return on assets ratio (%)	Debt-to-assets ratio (%)	Financial need
Panel A: Early adopters (all years):									
Mean	4.33	36.96	5.7	2.32	17,849.66	0.38	1.15	28.03	(0.12)
Median	4.39	30.00	5.5	1.50	2,737.65	0.45	2.34	23.31	0.02
SD	1.05	25.14	1.9	12.81	45,634.74	2.43	21.44	23.75	19.08
Minimum	0.96	0.00	0.0	0.00	0.00	(63.71)	(459.98)	0.00	(394.08)
Maximum	9.50	350.00	12.0	482.00	475,003.00	5.69	65.36	136.97	260.71
Panel B: Control firms (all years):									
Mean	4.29	43.51	5.5	1.10	2,010.14	(0.41)	(0.93)	20.85	0.00
Median	4.30	37.46	5.0	0.00	381.60	0.46	2.08	12.17	0.02
SD	1.10	25.16	1.8	8.31	5,702.18	34.03	23.04	23.98	0.20
Minimum	0.98	0.00	0.0	0.00	0.68	(1,262.57)	(292.74)	0.00	(1.66)
Maximum	6.80	165.00	10.0	312.00	67,458.70	4.59	41.72	213.41	1.46

Notes: Variable definitions: risk-free rate = manager's estimate of the risk-free rate of interest disclosed in the footnotes of the financial statements; stock price volatility = manager's estimate of the stock price volatility disclosed in the footnotes of the financial statements; time-to-maturity = manager's estimate of the time-to-maturity disclosed in the footnotes of the financial statements; dividend yield = manager's estimate of the dividend yield disclosed in the footnotes of the financial statements; size = natural log of the market value of equity; book-to-market ratio = book value of equity divided by the market value of equity; return on assets = income before extraordinary items available to common shareholders divided by total assets; debt-to-assets ratio = total liabilities divided by total assets; financial need = free cash flow divided by total assets

LIFE will be consistent with managers changing their estimates in a direction that will minimize the fair value of stock options and the related compensation expense. A significant positive coefficient for DIV has the same effect (Grinblatt and Titman, 2002). We estimate the following logistic regression model:

$$ADOPT_{it} = \alpha + \beta_1 VOL_{it} + \beta_2 RF_{it} + \beta_3 LIFE_{it} + \beta_4 DIV_{it} \quad (1)$$

Where,

ADOPT = is a dichotomous variable set to 1 if the company is classified as a voluntary adopter which recognized SFAS 123(R)stock option expense in the period 2002-2004, 0 otherwise.

VOL = management's estimate of stock price volatility as disclosed in the footnotes of the financial statements.

RF = management's estimate of the risk-free interest rate as disclosed in the footnotes of the financial statements.

LIFE = management's estimate of the average time-to-maturity for outstanding stock option grants as disclosed in the footnotes of the financial statements.

DIV = management's estimate of dividend yield as disclosed in the footnotes of the financial statements.

Next, we develop a logistic regression model using Black–Scholes model inputs and a set of control variables. This model is applied to the year of adoption for voluntary adopters and their pair-matched controls. A backwards stepwise elimination is used to develop a parsimonious model to determine which variables are most important to the voluntary adoption decision. The following model (2) also provides evidence to whether political costs are important to the decision to adopt SFAS 123(R) early:

$$ADOPT_{it} = \alpha + \beta_1 VOL_{it} + \beta_2 RF_{it} + \beta_3 LIFE_{it} + \beta_4 DIV_{it} + \beta_5 Size + \beta_6 BM + \beta_7 DA + \beta_8 ROA + \beta_9 FN \quad (2)$$

Where,

Size = natural log of the market value of equity.

BM = book-to-market ratio determined as the book value of equity divided by the market value of equity.

DA = debt-to-asset ratio determined as total liabilities divided by total assets.

ROA= return on assets determined as income before extraordinary items available to common shareholders divided by total assets.

FN = financial need determined as the free cash flow divided by total assets.

ADOPT, VOL, RF, LIFE and DIV are the same as for equation (1).

Dechow *et al.* (1996) have used size, book-to-market ratio, leverage and free cash flow as control variables. As Watts and Zimmerman (1978) argued that the size of the firm affects the political cost of its accounting choices, many papers that examined different accounting choices have controlled for firm size, including recent papers by Jones (2011). Schroeder and Schauer (2008) reported that the impact of stock option expensing on firm's net income was a function of firm size. Many prior papers (Jeter *et al.*, 2008) use the

natural logarithm of firm's equity as a proxy for firm size. Robinson and Burton (2004) have also defined size as the natural log of market value of equity and referred to this measure of size as a proxy for political costs. Jeter *et al.* (2008) have also controlled for the leverage level of the firm measured by the ratio of its total liabilities to total assets. In addition, Krishnan *et al.* (2008) have controlled for profitability measured by ROA which was preferred by Lie (2001) over the earnings per share as a profitability measure. Gul (2001) has reported that managers in firms with high free cash flows are more likely to adopt income-increasing accounting choices to increase their compensation.

The coefficients for size, BM and ROA are expected to be significantly positive. We anticipate that larger firms with higher market values and earnings are more likely to recognize stock option expense because they are more able to absorb the effects of this income-decreasing accounting change. The coefficients for DA and FN are expected to be significantly negative, as firms with a heavier debt burden or higher free cash flows are less likely to be willing to recognize an additional expense.

4. Results and discussion

The main results are summarized in Tables III-V. Table III summarizes mean differences for the four main inputs of the Black–Scholes option valuation model and five additional control variables. Table IV summarizes the year-by-year logistic regression of equation (1) from 2000 through 2007. Table V summarizes regression results for equation (2) for the adoption year and presents a parsimonious model of variables related to the decision to recognize stock option expense.

Examining the differences in means (Table III) between the adoption and control firms over the period demonstrates several interesting patterns. Grinblatt and Titman (2002) and Bartov *et al.* (2007) suggest that stock price volatility is the Black–Scholes model input over which managers have the greatest discretion. If managers were to preempt the effects of recognizing stock option expense by adjusting their estimates of inputs to the option pricing model, it should be detectible through a systematic reduction of the stock price volatility estimate.

Table III shows that the expected stock price volatility for the voluntary adoption firms was not significantly different from the volatility for control firms during the period from 2000 to 2003. Beginning in 2004, stock price volatility of voluntary adopters decreased each year. However, stock price volatility of the control firms remained about the same throughout the period. This suggests that managers did not use their discretion over estimated stock price volatility to reduce the *pro forma* stock option expense. Beginning with the issuance of SFAS 123(R), managers of voluntary adoption firms did take positive action to reduce the recognized stock option expense.

Grinblatt and Titman (2002) suggest that managers have less discretion in the Black–Scholes model estimates for dividend yield and time-to-maturity. However, Table III demonstrates that estimates of time-to-maturity for voluntary adopters became consistently shorter after issuance of SFAS 123(R). This result is consistent with managers of voluntary adoption firms using their discretion to reduce the option life for new grants and accelerating their vesting period (Balsam *et al.*, 2008).

Dividend yield for voluntary adopters was significantly higher than the yield for control firms across the entire period. High dividend yield reduces stock price which reduces the fair value of options (Grinblatt and Titman, 2002; Core and Guay, 2002). However, dividend yield does not demonstrate the same pattern as stock price volatility

Table III. Mean differences by year for Black–Scholes model inputs and control variables

Year	Category	Risk-free rate (%)	Stock price volatility (%)	Time-to-maturity (years)	Dividend yield (%)	Size ($ millions)	Book-to-market ratio	Return on assets ratio (%)	Debt-to-assets ratio (%)	Financial need
2000	Early adopters	5.963	39.383	5.894	2.216	17,407.980	0.2435	(0.5390)	27.9131	(0.0064)
	Controls	6.006	42.930	5.271	0.837	1,019.360	1.1132	(2.6482)	18.7174	0.0129
	t-values	0.645	1.101	3.308***	6.135***	4.103***	2.202**	0.800	4.103***	0.997
2001	Early adopters	4.921	40.094	5.829	2.119	16,558.460	0.5548	(0.9190)	29.2225	1.3878
	Control	4.780	44.506	5.265	0.798	1,493.110	0.7755	(2.4679)	19.8582	(0.0286)
	t-value	1.585	1.468	3.056***	6.087***	4.124***	2.734***	0.694	4.158***	1.016
2002	Early adopters	4.064	39.745	5.745	2.053	13,075.860	0.3780	0.1973	29.3824	1.5270
	Controls	3.860	44.485	5.278	0.829	1,540.720	(0.4013)	(1.5128)	19.9463	0.0148
	t-values	2.069**	1.708	2.432**	5.760***	4.405***	0.698	0.776	4.049***	1.006
2003	Early adopters	3.281	41.261	5.818	2.083	16,069.510	0.3456	1.9747	27.9746	(1.1507)
	Controls	3.158	44.816	5.727	0.916	1,647.060	0.5207	0.3306	20.4524	0.0271
	t-values	1.412	1.139	0.450	5.073***	4.734***	1.072	0.870	3.158***	0.991
2004	Early adopters	3.466	37.136	5.547	1.856	18,276.700	0.4378	3.6704	27.2430	(0.5797)
	Controls	3.516	45.315	5.797	0.924	2,016.820	0.4952	(0.0077)	22.6405	(0.0012)
	t-values	0.687	3.552***	1.248	4.563***	4.776***	0.975	2.178***	1.618	0.958
2005	Early adopters	3.980	34.944	5.549	1.864	18,787.830	0.4037	0.3168	26.9989	0.8284
	Controls	3.992	43.023	5.678	0.977	2,393.360	0.4984	0.2590	22.2430	0.0028
	t-values	0.231	3.676***	0.633	4.505***	4.949***	1.267	0.017	1.849*	1.012
2006	Early adopters	4.585	32.135	5.460	1.846	21,610.640	0.3052	3.6583	26.8481	(0.4585)
	Controls	4.558	41.308	5.646	0.915	2,754.980	0.4945	(1.2651)	20.2345	(0.0304)
	t-values	0.539	4.559***	0.958	5.123***	5.072***	1.209	2.102**	2.642***	0.896
2007	Early adopters	4.523	30.603	5.413	4.750	21,185.580	0.3727	0.7355	28.7783	(2.6630)
	Controls	4.478	41.471	5.187	2.791	3,159.810	(7.3301)	(0.2007)	22.7937	0.0080
	t-values	0.909	5.553***	1.242	0.564	4.683***	0.997	0.425	2.031**	0.680
All years	Early adopters	4.329	36.960	5.657	2.320	17,849.660	0.3804	1.1528	28.0316	(0.1171)
	Controls	4.289	43.513	5.486	1.098	2,010.141	(0.4075)	(0.9298)	20.8529	0.0003
	t-values	1.010	7.026***	2.490**	3.057***	12.934***	0.872	2.521**	8.083***	0.210

Notes: *; **; *** indicates statistical significance at the 0.10, 0.05 or 0.01 level, respectively

Table IV. Logistic regression of Black–Scholes model estimated inputs

	All years	2000	2001	2002	2003	2004	2005	2006	2007
Intercept									
Coefficient	−0.17	−0.80	−2.03	−1.21	−0.87	0.72	0.02	0.36	0.58
Chi-square	0.70	0.40	7.61***	5.11**	2.75*	1.33	0.00	0.08	0.20
Risk-free rate									
Coefficient	0.02	−0.12	0.14	0.08	0.13	0.06	0.21	0.09	0.05
Chi-square	0.35	0.44	0.88	0.38	0.97	0.10	0.73	0.12	0.04
Stock price volatility									
Coefficient	−0.01	0.00	0.00	0.00	0.00	−0.01	−0.02	−0.02	−0.04
Chi-square	19.57***	0.07	0.14	0.00	0.15	5.93**	6.79***	7.51***	24.19***
Time-to-maturity									
Coefficient	0.03	0.17	0.14	0.08	0.00	−0.12	−0.11	−0.07	0.11
Chi-square	1.70	6.45**	4.31**	1.36	0.00	2.82*	2.85*	1.51	2.03
Dividend yield									
Coefficient	0.15	0.35	0.37	0.34	0.28	0.22	0.23	0.25	0.00
Chi-square	48.53***	24.41***	23.23***	20.91***	18.79***	11.59***	12.36***	11.17***	0.51
Model									
Observations (n)	2,909.00	359.00	363.00	371.00	372.00	372.00	371.00	371.00	330.00
Likelihood ratio	110.19***	46.62***	45.34***	38.15***	28.16***	30.12***	29.92***	36.92***	33.89***
Wald	98.47***	33.20***	31.71***	28.52***	21.43***	25.21***	25.12***	30.11***	26.38***

Notes: *; **; *** indicates statistical significance of chi-squares at the 10 per cent, 5 per cent and 1 per cent level, respectively; dependent variable is the ADOPT which is a dichotomous variable set to 1 if the company is classified as an early adopter which recognized SFAS 123(R) stock option expense in the period 2002-2004, 0 otherwise

Table V. Prediction model for voluntary adoption of SFAS 123(R) stock option expense

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Intercept						
Coefficient	−4.9868	−4.9332	−4.7491	−4.2950	−4.3010	−4.0529
Chi-square	20.8566***	23.2807***	30.5033***	27.4828***	27.6985***	27.1907***
Risk-free rate						
Coefficient	0.3137	0.3199	0.2657	0.2318	0.2237	0.2228
Chi-square	3.6903*	4.1427**	3.4051*	2.7455*	2.6034	2.5984
Volatility						
Coefficient	0.0137	0.0135	0.0094	0.0095	0.0089	0.00871
Chi-square	5.5492**	5.7301**	3.3908*	3.7588*	3.4659*	3.5081
Time-to-maturity						
Coefficient	0.0109					
Chi-square	0.0192					
Dividend yield						
Coefficient	0.2740	0.2738	0.2627	0.2791	0.2788	0.2779
Chi-square	11.9193***	11.8963***	11.3783***	14.2611***	14.2090***	14.3005***
Size						
Coefficient	0.3818	0.3807	0.3487	0.3795	0.3877	0.3757
Chi-square	21.8638***	21.9534***	30.6327***	30.2160***	32.4700***	31.5178***
Book-to-market						
Coefficient	0.3724	0.3781	0.3935	0.2720	0.2925	
Chi-square	1.3147	1.3806	1.8419	0.9214	1.0917	
Debt-to-assets						
Coefficient	0.0022	0.00218	0.0106			
Chi-square	0.1143	0.1138	3.3723*			
Return on assets						
Coefficient	0.0090	0.0090	0.0058	0.0047		
Chi-square	0.8662	0.8572	0.5152	0.3784		
Financial need						
Coefficient	−0.3060	−0.2917				
Chi-square	0.1195	0.1102				
Model						
Likelihood ratio	64.2498***	64.2307***	83.7727***	78.2654***	77.8574***	76.7458***
Classification per cent	75.9	76.0	77.1	75.7	75.5 per cent	75.9 per cent

Notes: *; **; *** indicates statistical significance of chi-squares at the 10 per cent, 5 per cent and 1 per cent level, respectively; dependent variable is the ADOPT which is a dichotomous variable set to 1 if the company is classified as an early adopter which recognized SFAS 123(R) stock option expense in the period 2002-2004, 0 otherwise

or time-to-maturity. There is no increase in dividend yield corresponding to the issuance of SFAS 123(R). Furthermore, given the importance of dividend policy to investors, it seems unlikely that management is using dividend yield for this purpose. We assume that there are other overriding economic forces determining dividend yield (Brav *et al.*, 2005; Allen and Michaely, 2003).

The risk-free interest rate is an exogenous variable in that it is derived from market forces outside the control of management. So, it is not surprising that interest rate levels do not respond to the issuance of SFAS 123(R). Consistent with our expectations, voluntary adopters are larger firms with generally higher earnings and lower book-to-market ratios. Moreover, the free cash flow variable demonstrates no particular pattern, and the debt-to-assets ratio indicates that early adopters have a higher debt burden than control firms.

Table IV provides year-by-year results for equation (1) involving the four disclosed Black–Scholes model inputs. The coefficient for stock price volatility is close to zero before issuance of SFAS 123(R), but becomes consistently negative after that. The coefficient for time-to-maturity is consistently positive before, but becomes negative from 2004 to 2006. The coefficient for the risk-free interest rate is not significant and the coefficient for dividend yield is consistently significant throughout the period. These results are consistent with the proposition that management is using its discretion in estimation of stock price volatility and time-to-maturity to reduce the fair value of stock options.

Taken together, Tables III and IV provide some evidence for rejecting H_{02}. The evidence supports the conclusion that managers might be engaged in some preemption behavior by using their discretion to reduce the fair value of stock options and preempt the effects of recognizing stock option expense under SFAS 123(R). Furthermore, it appears that stock price volatility and time-to-maturity are the estimated pricing model inputs that are more useful for this purpose. Consistent with Bartov *et al.* (2007), stock price volatility appears to have the greater impact on the fair value of stock options. These findings are also consistent with Johnston (2006) who found that managers used their discretion to reduce the SFAS 123(R) stock option expense in 2002, but inconsistent with Hodder *et al.* (2006).

However, we fail to reject H_{01}. Consistent with Balsam *et al.* (2003), there is no evidence suggesting that managers use their discretion over the Black–Scholes model inputs to reduce the disclosed *pro forma* stock option expense. During the period of 2000-2003, Tables III and IV demonstrate that the stock price volatility of voluntary adopters and control firms was not significantly different. During this same period, Table III shows the time-to-maturity was significantly longer for voluntary adopters, which is consistent with disclosing higher fair values and larger *pro forma* stock option expense under SFAS 123. These findings are inconsistent with Aboody *et al.* (2006), who find that managers understate the *pro forma* stock option expense. However, they compare disclosed option fair values to benchmark values. We look only at the option pricing model input values disclosed by management and how these estimates change over time.

Table V summarizes the logistic regression analysis of equation (2). The decision to adopt SFAS 123(R) is characterized for voluntary adopters and their pair-matched controls for the year of the adoption. A stepwise backwards elimination was used to reduce the full model (Model 1 in Table V) to the final parsimonious model (Model 6 in

Table V). The final model (significant at the 0.01 level) was able to correctly identify voluntary adopters or control firms 75.9 per cent of the time.

However, the purpose for this analysis is to determine whether political costs or other firm attributes characterize the voluntary adoption decision. The final model [in equation (3) below] describes those variables most closely associated with the voluntary adoption decision:

$$Adopt = -4.0529 + 0.2228\,RF + 0.00871\,VOL + 0.2779\,DIV + 0.3757\,Size \quad (3)$$

The risk-free rate of interest, stock price volatility, dividend yield and size remain in the final model. In 2003, when 80 per cent of the early adoptions took place, the risk-free rate was favorable for the decision in that it had dropped from higher levels in earlier years. The stock price volatility for voluntary adopters was at its peak, providing managers with the opportunity to preempt or minimize the effects of this accounting change. The risk-free rate and stock price volatility are both positive but not significant in the model.

The decision to adopt SFAS 123(R) voluntarily seems to have been primarily a political decision. Deshmukh *et al.* (2006) asserted that voluntary adoption of SFAS123(R) was essentially a political act. Given the political climate after Enron and the Sarbanes–Oxley Act, they argued that it was politically advantageous for a company to be seen as having higher-quality corporate governance and more transparent financial statements. Holthausen and Leftwich (1983) argued that political cost could be captured using two variables: size and leverage. Size is a proxy for political visibility, while leverage is a proxy for contracting and monitoring costs. Watts and Zimmerman (1978) provide an alternative interpretation for political costs where large firms tended to be voluntary adopters of income-decreasing accounting changes because they have the capacity to absorb the impact of the new regulation without impairing the future prospects of the firm.

While Aboody *et al.* (2004) found voluntary adopters of SFAS 123(R) to be larger firms, they did not distinguish between the two views of political costs. Dechow *et al.* (1996) examined the respondents to the Standard's Exposure Draft and found those firms actively participating in the process were not the larger firms. This suggests size may not be the best proxy for political visibility with the early adoption of SFAS 123(R).

The results in Table V indicate that voluntary adopters are systematically larger firms with higher dividend yields than control firms. While the debt-to-assets ratio is significantly larger for voluntary adopters in 2003 (Table III), it appears not to play a significant role in the adoption decision. The voluntary adopters are also characterized as having higher return on assets and lower book-to-market ratios in 2003 (Table III). Taken together, these results favor the Watts and Zimmerman (1978) interpretation of political costs. The voluntary adopters in this study seem to have been better able to absorb the income-decreasing effects of this accounting change than the control firms. This is consistent with Sami and Welsh (1992), who found that voluntary adopters of SFAS 87 were larger firms with more fully funded pension obligations.

5. Conclusion

Companies may use accounting choices for sending a signal to the market. Companies adopting income-reducing accounting rules voluntarily are perceived to be sending a reliable signal due to the compliance costs. Voluntary adoption of SFAS 123(R) may have signaled good corporate governance and higher transparency of financial

statements for adopting firms, but they have also incurred the compliance costs associated with this signal.

This research examined the period before and after voluntary adoption of SFAS 123(R) for evidence of preemption to mitigate its effect through the mandatory adoption period. During the periods of disclosure of *pro forma* stock option expense under SFAS 123, there is no evidence of using the option pricing model inputs to manage options' fair value and related disclosed compensation expense. After adoption of SFAS 123(R), the evidence supports the proposition that managers are preemptively using their discretion to decrease estimated fair value of stock options by reducing two of the option pricing model inputs on which management has more discretion. The reduction of stock price volatility and time-to-maturity allowed managers to reduce the recognized compensation expense.

Consistent with Watts and Zimmerman's (1978) interpretation of political costs, the voluntary adopters of SFAS 123(R) were larger firms with higher dividend yield than control firms. These firms should be better able to absorb this income-decreasing accounting change. Furthermore, the documented use of management's discretion would facilitate the process by preempting the income-reducing effects of the adoption and increasing the likelihood that voluntary adopters would be able to absorb the adverse effects of this accounting change.

The results of this paper should have important implications for accounting regulators, practitioners and other financial statement users. Accounting regulators need to be thoughtful when they set the effective dates of their new accounting pronouncements. On one hand, they need to allow preparers and practitioners enough time to adapt to any new requirements. On the other hand, long transition periods before the effective dates might induce preparers to design or enter into some new contractual arrangements that might undo the intended goals behind issuing the new standard in terms of improving recognition and disclosure of some economic circumstances in the firm. This will be especially true for accounting areas where management discretion and intention play a significant role in financial reporting. Results of the paper have also implications for accounting regulators when considering the economic consequences of their accounting pronouncements and deciding whether to allow early adoption of the newly issued pronouncement before its mandatory effective date. Results should also have some implications for financial analysts and users of financial statements to recognize that the early voluntary adoption of new accounting pronouncements should not be always perceived as a signal of better or superior financial reporting quality. Early and voluntary adoption of new accounting pronouncements might just be a mechanism used to alleviate or smooth out their ultimate effects on financial statements before the announced official effective date when users of financial statements start to closely monitor and discount the effects of the newly mandated accounting rules and compare their effects on different companies.

Note

1. In a similar study, Ahmed *et al.* (2006) examined the valuation of common stock of banks. Some of the banks recognized the value of portfolios of traded stock options under SFAS 133, while others disclosed these values. Recognition of derivative values resulted in significantly different valuations from controls.

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