

# Special Stock Option Watch

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This seventh issue of ZEW-Stock Option Watch focuses on the costs of stock option plans and their presentation in corporate balance sheets. The first article, by Erik Lüders (Dresdner Bank and ZEW) and Michael Schröder (ZEW), briefly reviews accounting transparency in DAX30 companies. The second article by Swen Bernitz (FIRICON GmbH) looks in detail at the accounting rules applying to stock option plans under the International Accounting Standards (IFRS 2). His article encompasses companies listed on the DAX30, the MDAX and the

TecDAX. The costs which stock option plans impose on Euro-Stoxx50 companies are examined in the third article by Jörg Engelbergs (Boston Consulting) and Zacharias Sautner (University of Amsterdam). Finally, the fourth article by Boyce Watkins (Syracuse University, New York) considers the impact of the Sarbanes-Oxley Act on the design and costs of stock option plans in the USA.

*Erik Lüders (Dresdner Bank AG and ZEW)  
and Michael Schröder (ZEW)*

## Accounting for Stock Option Plans: An Update for DAX30 Companies

In recent time harsh criticism has again been levelled at the accounting of stock option programmes. This upsurge in criticism is largely the result of new cases of fraudulent stock option practices which, in the cases of CNET Networks and Boston Communications for example, have forced senior managers to step down. The Frankfurter Allgemeine Zeitung reported on 13 October 2006 that almost 30 managers or supervisory board members of US companies had lost their positions in recent months in connection with these irregularities.

### Backdating of options

Most allegations relate to backdating in which managers were able to acquire options at particularly attractive conditions without this becoming apparent to shareholders. Granting an option after a significant increase in the company's share price whilst at the same time backdating the grant to an earlier point



in time suggests to shareholders that the manager had received the option at the money or even out of the money and that the subsequent profit for the manager was simply the result of the sharp rise in share prices. In reality, the manager was granted the option at a time at which the option was already deep in the money. The wool is thus pulled over shareholders' eyes as far as the true

nature of the financial transfer is concerned and the intended purpose of the options – to boost managers' motivation – is also undermined.

This is exacerbated by the fact that, depending on the accounting guidelines applied, it is not the fair value of an option which needs to be disclosed but only its intrinsic value. In the case of options at- or out-of-the-money this

Figure 1: Proportion of inadequately reported expense

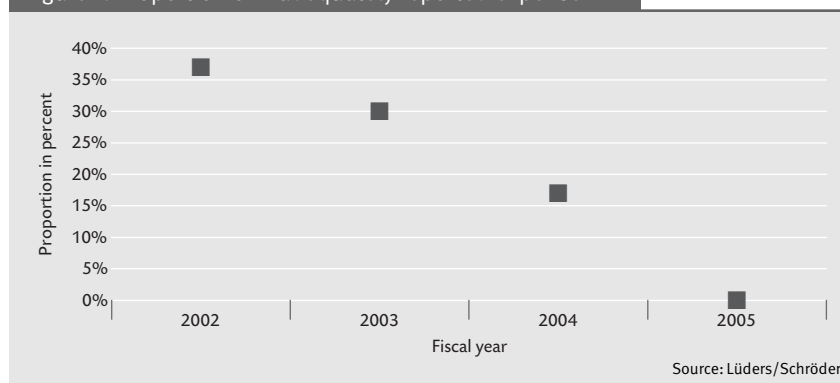
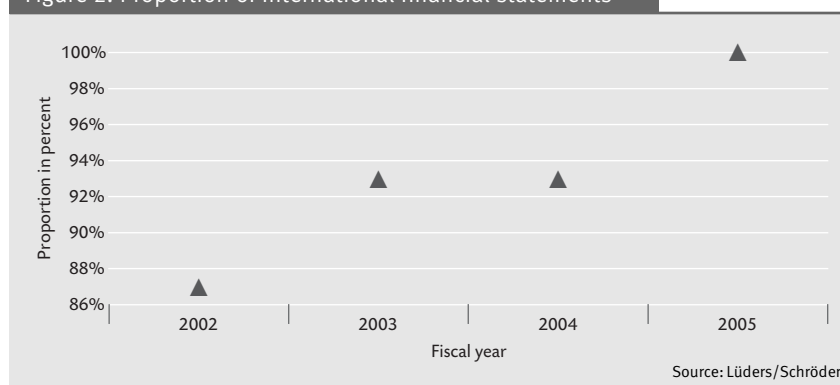


Figure 2: Proportion of international financial statements



means that options have no impact at all on the income statement (refer for example to ZEW Discussion Paper No. 01-42, Mannheim or Swen Bernitz (2006) "Accounting for Stock Option Plans under IFRS 2", Stock Option Watch, this issue).

### Current issues regarding the granting of options

This is not the place, however, to discuss the undoubted existence of stock option malpractice. The focus of this article is rather on some important current issues affecting the granting of options to employees in German companies and the transparency of reporting. This is based on the database of employee options set up by the ZEW in 2003. The database currently covers the period 1999 to 2005 (refer also to our analysis in the first issue of Stock Option Watch in June 2003) and – despite the unsatisfactory quality of the data – now provides an impressive source of information on DAX30 companies in particular. It is not always possible to get a clear picture from the available data of the scope and design of option program-

mes. Further analyses can be found in the article "Accounting for Stock Option Plans under IFRS 2" by Swen Bernitz in this issue of the Stock Option Watch.

In 2005, 27 out of the 30 companies contained in the DAX offered stock option programmes to their employees. In nine companies these programmes have been open only for top executives, but 18 companies also included employees below this top management level. In four out of these 18 companies the stock option programmes for executives and employees are even identical.

Although most of the DAX companies support the participation of employees in the economic success of the company there is a clear-cut distinction to the programmes for the top executives. Whereas the latter participate in stock option programmes the former receive support in almost all cases only for purchasing stocks. And these cases only refer to the company's own stocks. For employees the financial incentives are therefore much lower and bear the risk of being insufficiently diversified.

From the point of view of investors, it is the quality of the information about stock option programmes which is deci-

sive. Figure 1 shows the share of transactions for which the elementary information needed to calculate the value of the options granted is not available. Most data is derived from the DAX30 companies themselves. It is important to note, however, that a substantial improvement has taken place in recent years. In the fiscal year 2005 the data available for all the companies in the sample was sufficient for the purpose of estimating the value of option grants. The lack of this information in previous years does not, however, mean that the law had been broken as the reporting of this data is not mandatory now, and certainly was not in the past. On the other hand, this information gap does not suggest either that all the required information has been provided.

### Improved data situation

The improvement in the data provided in recent years coincides with a tendency to present annual financial statements which comply with international rules, i.e. IAS/IFRS and US-GAAP. All the DAX30 companies submitted financial statements for fiscal 2005 which complied with one of the two international standards (refer to figure 2).

Summing up it is apparent that while the quality of the information on stock option programmes provided in the annual financial statements of major German companies has significantly improved in recent years, the level of detail available still leaves much to be desired and it continues to be difficult for investors to gain a clear picture of how a company's stock option programme actually works.

In one of the next issues of the ZEW Stock Option Watch we will report also the information on the companies included in the MDAX. The MDAX contains 60 medium-sized companies and comprises the segment of the German stock market below the DAX30. It will be of particular interest to see whether these companies also make extensive use of stock option programmes as incentives for their management.

*Erik Lüders\* und Michael Schröder*

\* The opinions expressed here are exclusively those of the author and not necessarily those of Dresdner Bank AG.

# Accounting for Stock Option Programmes under IFRS 2

After many years of controversial debate on the recognition of stock options in financial statements, the International Accounting Standards Board (IASB) finally issued the provisions of IFRS 2 "Share-based Payment" in 2004. IFRS 2 sets down rules for the recognition of share-based payments, i.e. for transactions in which accounting entities grant equity instruments as consideration for goods or services received or incur liabilities that are based on the price or value of the entity's shares. The standard focuses on share option plans and similar form of remuneration (referred to in the following "stock options") for the work of employees, directors and senior executives. Companies which are required to present accounts in accordance with the IFRS international accounting standard must apply IFRS 2 to all fiscal years commencing after 31 December 2004.

## Expensing

According to IFRS 2 stock options must always be shown in the balance sheet at their fair value, whereby the fair value must be spread as employee expenses over the vesting period. The fair value of the options must be calculated using a technique which is consistent with generally accepted valuation methodologies. The accounting rules distinguish between equity settlement and cash settlement. In the case of options accounted for according to the equity settlement method, it is the fair value on the grant date that is decisive. The fair value of cash-settled options must be remeasured at each reporting date.

A study performed by FIRICON has examined the way DAX, MDAX and TecDAX companies used and implemented IFRS 2 in the fiscal year 2005. The study focused on an analysis of the measurement of stock options taking account of the appropriateness of the option price models and input parameters used.

Of the 110 DAX, MDAX and TecDAX companies, 62 reported share-based payment with optional components according to IFRS 2 in their accounts. The absolute employee expenses for stock options shown by these companies was between 19,000 and

650,000,000 euros and corresponded, on average, to 5.08 percent of consolidated performance.



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Any interpretation of the expenses incurred by different companies must, however, take account of the fact that the number of employees profiting from such schemes differs from company to company. Some firms have only set up stock option plans for board members, while others run schemes for several hundred employees. Some companies did not grant new options in the fiscal year 2005 and only posted expenses on a proportional basis for old programmes.

## Valuation models

The valuation technique for determining the fair value of stock options and the option price model used "shall be consistent with generally accepted valuation methodologies for pricing financial instruments, and shall incor-

porate all factors and assumptions that knowledgeable, willing market participants would consider in setting the price" (IFRS 2.17). Valuation models for options accepted in the realm of financial mathematics include the Black-Scholes model, (binomial or trino-

mial) tree models and the Monte Carlo method.

The stock option programmes of German companies can usually be exercised after a vesting period of two to four years during several exercise periods in subsequent years. In financial mathematics such options are distinguished from other one-off options ("European options") or options which can be exercised at any time during their lives ("American options") and classified as Bermuda options. The standard Black-Scholes model can only be used to value European options, i.e. options which can only be exercised at the end of their life.

Most programmes also have absolute targets in the form of price increase hurdles and/or relative targets in relation to a benchmark index which cannot be taken into account by the Black-Scholes model. These options can only be correctly measured using a binomial

model (or trinomial model) or a Monte Carlo method.

In reality, most option plans with an absolute and/or relative target are measured with a binomial model or using the Monte Carlo method. The Monte Carlo method in particular is the standard method used if the exercise of options depends on outperforming a benchmark index. Simply designed option plans are mainly valued using the Black-Scholes model – even though the model is only wholly suitable for the correct valuation of very few stock option plans.

### Expected volatility

The most important parameter for the valuation of a stock option is expected volatility as a key indicator of the range of fluctuation of (future) share prices. Standard IFRS 2 proposes estimating expected volatility on the basis of the implied volatility of traded share options or other traded instruments of the entity that include option features. Additionally or alternatively, the histori-

cal volatility of the share price is proposed, with a time window based on the (expected) term of the option. The historical volatility may, in some circumstances, be determined ignoring certain periods during which the price was subject to extreme fluctuations due to unusual one-off events.

Only a very small proportion of the shares of the companies considered in the study produced options which are traded on the Eurex and/or warrants for private investors. The main problem in terms of stock exchange traded options and warrants, however, is that these instruments usually only have a short term. It is therefore doubtful whether the implied volatility of these options can be used to value stock options with a longer term.

Most of the valuations of the options issued by the companies included in the study were made on the basis of historical volatility as an estimate of expected volatility. However, the calculations for some companies are not entirely intelligible. While using comparatively low volatilities, the employee

expenses shown by these companies are far too low.

### Disclosure in the notes

IFRS 2 requires companies to disclose extensive information about existing stock option plans in the notes to the annual report. IFRS 2.44 requires that companies “enable users of financial statements to understand the nature and extent of share-based payment arrangements that existed during the period”. The subsequent paragraphs deal with the different publication requirements for equity and cash settlement options.

Our study shows that the transparency required in terms of stock option plan arrangements and valuation are in many cases inadequately met in annual reports and could be improved right across the board. 32 percent of companies fail (at least partly) to provide the information about option valuations in the notes which is required by IFRS 2.

The full study is available for download at [www.firicon.de](http://www.firicon.de).

*Swen Bernitz*

# Cost Effects of Stock Option Programmes for Euro Stoxx 50 Companies

Stock option plans for managers and employees have attracted increasing attention both in the academic literature and in the public in recent years. The public debate has thereby focused primarily on the escalation of top managers' salaries as a result of option compensation and on the question of whether or not to expense the costs of stock option plans in company accounts (as formulated, for example, by the accounting standard IFRS 2 “Share-Based Payment”).

### Effects on financial statements

New accounting rules now require firms to expense the costs of their em-

ployee stock option plans in their income statements and this naturally raises the question as to what extent expensed stock options will affect the financial statements of these firms. It also raises the question whether the new accounting rules will affect the way employee stock options are used in the future as a remuneration tool to align incentives. The set of existing studies on the cost effects of stock option plans has primarily looked at firms in the US and rigorous studies for European firms are therefore very rare.

A proper estimation of the cost effects of stock option plans is relatively difficult, as employee stock options show features that make them rela-

tively difficult to value. The estimated accounting costs of stock option plans are affected, for example, by employees leaving their companies (as that implies that issued but unvested stock options usually forfeit before maturity). The limited tradability of employee stock options – which leads to exercise behaviour which differs substantially from that of traditional traded options – further impacts the estimated costs of option plans as it usually leads to earlier exercise decisions and hence short maturities (see for example the work by Heath et al., 1999 or by Sautner and Weber, 2006).

The consequences of these features have been tackled in numerous valua-

tion models, whereby some of these modelling approaches go far beyond the requirements suggested in the recent accounting standards. Examples for such complex valuation approaches include the models by Huddart (1994) or by Kulatilaka and Marcus (1994) who calculate the value of employee stock options on the basis of an utility-oriented approach. Carpenter (1998) presents a model in which early decisions to exercise and forfeiture are taken into account by including an exogenous and stochastic stopping rate into a binomial option tree (the occurrence of the stopping status is followed by an exercise decision).

### Euro Stoxx 50 companies

To get an idea of the cost effects of stock option plans for the largest companies in the Euro-Zone and to assess the importance of options for companies' annual financial statements, we have carried out an extensive study which has been published recently in Engelbergs and Sautner (2006). Our study was based on the annual financial statements of the Euro Stoxx 50 companies of the year 2003.

Apart from looking at the cost effects of stock option plans, we have also analysed the extent to which the choice of a valuation model influences the costs of stock options. We therefore applied ten different valuation models and compared the hereby estimated cost effects. To assess the significance of these cost effects, we looked at the effects on the company's reported profits, on the stated balance sheet equity and on firms' returns on sales. Our results are of relevance both for readers of financial statements who want to assess the cost effects of stock options in future financial statements and for companies who are considering whether or not to continue using stock option plans.

### Considerable costs

The main findings of our study can be summarised as follows. From an economic perspective, the stock option plans we looked at imply quite considerable

costs. By applying the valuation method proposed in IFRS 2, we find that the stock option plans in our sample would have substantially influenced the annual financial reports of the year

2003 (with an average value of around 140 million Euro). In the most extreme case, the expenses would have exceeded the amount of 800 million Euro. If the IFRS approach is used, median company profits are reduced by 2.21 percent, reported balance sheet equity by 0.30 percent, and return on sales by 0.17 percentage points. In some cases, stock option expenses would have been higher than 20 percent of the reported equity and would have reduced the returns on sales by 5 percentage points.

However, the overall picture is very mixed due to the fact that many companies only make very moderate use of stock options. In Engelbergs und Sautner (2006), we also show in detail what results are produced if alternative valuation models are used. Overall, we can show that the choice of the valuation models has a considerable impact on the estimated cost effects.

### Inconsistent overall picture

Our study consciously ignored the effects of taxes as tax regulations differ significantly across Europe and as the specific tax rates are very difficult to implement in the cases of our sample companies. Tax effects can, however, fundamentally reduce the final cost ef-

fects so that the results of our study should be seen as an upper bound of the effects. Finally, it is important to point out that our study only looks at the cost effects of stock options. A comprehensive assessment of the overall desirability of stock option plans

must hence also take into account the benefits of option plans. In order to make a final decision on the whether or not to continue with an option plan, one therefore has to contrast the determined cost effects with the anticipated benefits of a plan (incentive effects, motivation effects, employee retention effects etc.).

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# Stock Option Programmes and the Sarbanes-Oxley Act of 2002

On 30 July 2002, US-President George W. Bush signed into law the Sarbanes-Oxley Act of 2002. The legislation was designed to protect investors, increase corporate accountability, and improve the reliability and transparency of corporate information. The act was a response to public outrage generated from the scandals at prominent American companies, namely Enron and World-Com, in which manager misbehaviour was alleged and investors lost billion dollars. Sarbanes-Oxley is considered to be the most sweeping change in US Securities law since The Securities Exchange Act of 1934.

The act has several provisions, including but not limited to the following:

- Administrators of individual account plans must give 30 days advance notice of any pension fund blackout period, and no insider trading can occur during such periods.
- Prohibition of all personal loans to executive officers and directors, as well as the arrangement of financing or extension of existing loans.
- CEO and CFO certifications of financial statements released by the company.
- Each publicly traded firm must create an “adequate internal control structure” and procedures of financial reporting.
- The creation of the US Public Company Accounting Oversight Board, a government organisation designated to regulate and monitor auditors and public accounting firms.
- Enhanced financial disclosure of all material non-balance sheet financial items, particularly stock options and other contingent liabilities of the firm.

Sarbanes-Oxley (hereafter referred to as SOX) impacts the use of options within firms in at least three ways. First, the prohibition of all personal loans to executive officers and directors reduces the ability of the manager to exercise stock options without providing neces-

sary cash for exercise. Secondly, greater corporate disclosure rules require stock option agreements to be recognized by the company and possibly expensed on the company’s balance sheets. Third, the backdating of company stock option grants has now been highlighted as a potential source of corruption in American companies.

## Long-term implications

American companies are finding the SOX regulations to be both confusing and costly, as an entire industry has been created for consultants helping companies come into compliance. Aggregate cost estimates for SOX compliance range from 5.8 billion US-dollar to 1.7 trillion US-dollar (Zhang 2005). The wide range of cost estimates shows that the investing and research communities have yet to become fully aware of the

has become more time-consuming, complex and risky, as prison sentences and the loss of personal assets are possible for board members and managers found to be out of compliance. For example, ten former Enron directors agreed to personally pay 13 million US-dollar each as part of a 168 million US-dollar settlement for fraudulent accounting practices (Eichenwald, 8 January 2005).

There are at least three manners through which SOX legislation has impacted the use of stock options in American corporations. They are stated and discussed below.

## Cashless exercise of stock options

The cashless exercise of company stock options (typically through an arrangement established with a broker of the company’s choosing) was once a



long-term implications of the legislation. Also, many are starting to question whether the benefits exceed the costs, as American stock exchanges are losing business to overseas markets.

Not only has the stock option as a tool for incentive alignment become more costly, this problem is compounded by the fact that board members are likely to demand greater compensation for performing their duties. The job of the American corporate board member

widely accepted practice of American companies. Rather than providing the cash necessary to exercise stock options, firms would arrange for financing by a broker (sometimes via margin loan against the shares acquired), and allow the option holder to repay the firm with the proceeds from the immediate sale. The company may also participate in the arrangement by either providing the broker with shares equal in value to the exercise price, which the broker then



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sells on the open market, or promising the broker that shares will be delivered subsequent to the transaction if the broker agrees to sell its own inventory in the market.

Section 402 of the new SOX regulations (Securities Lawyers Deskbook, University of Cincinnati) prohibits loans or financing created by a firm for the benefit of executive officers and directors of a firm. Given the tone of this regulation, the cashless exercise of stock options has been called into question. Technically, cashless exercise agreements are a loan to the manager, which is against the law. The SEC has not provided a great deal of guidance regarding whether or not the use of such programmes would be prohibited under SOX. Most American legal firms have recommended that their clients not allow for cashless exercise among firm managers unless it is a contractual obligation.

In some cases, SOX regulations have led companies to force the exercise of executive stock options by directors. Dominion Resources, Inc. recently forced its employees to prepay all corporate loans by exercising existing stock options (Taub, Steven, "Sarbanes-Oxley Forces Options Exercise", CFO.com). The company's decision, to comply with SOX regulations, reversed prior decisions in 1999 to further align management and shareholder incentives by forcing its directors to own three to eight

times their annual base salary in firm shares. The company approved the 1999 plan with its shareholders, and then provided loans to directors to enable them to purchase their shares. The programme has been reversed in order to comply with SOX regulations.

The general conclusion is that while the abuse from corporate loans might be eliminated by SOX, an important tool of incentive alignment via leverage and derivatives has also been removed. A more practical method of dealing with the abuse may have consisted of greater regulation of corporate personal loans, rather than eliminating them altogether. But future tests from the courts are likely to determine the depth of SOX enforcement.

### Greater corporate disclosure rules

Many academics, investors and even corporate managers have been in favour of the disclosure of off-balance sheet financial contingencies. However, it has been long held that the use of expensive contingent liabilities creates a hidden cost to shareholders that does not readily appear on the firm's financial statements. Kenneth Lay, CEO of Enron, possessed 782,380 options on Enron's stock shortly before his firm's collapse. The shares were sold for 123.4 million US-dollar (Ackman, March 2002). Such abuses led to greater regulation of the use of stock options by all firms.

SOX regulation requires that all forms of compensation be reported on form 4. This leads to, at the very least, companies reporting the full value of the option to the investor at the time the option was granted. However, additional ambiguity in the new regulation has led some to speculate that the Financial Accounting Standards Board may require the expensing of all stock options.

Most of the controversy regarding the disclosure of stock options involves how these options should be valued. The Black-Scholes model is an obvious candidate, but it has been shown to overvalue options (Guay/Kothari/Sloan 2003). Additional complications, such as years of vesting, transferability, taxes, etc. make it extremely difficult to determine a uniform standard of valuation. It has been suggested that exercise date accounting may be more appropriate, since it gives a clearer view of the value of the option (Rubinstein 1994). This would achieve the goal of greater transparency and lead to a more accurate assessment of the option's value. Efficient markets dictate that investors, when provided with accurate information, should be able to adjust the firm's price to account for option contracts. But this viewpoint has been questioned.

### The elimination of backdating activities

The practice of backdating appears to have been widespread among American companies. Backdating is effective when the date the company reports that the options were granted is not the actual date on which the compensation decision was made. In most cases, the date is moved to a day on which the stock was trading at a lower price, so as to maximise the value of the stock option. The practice of backdating is derived from previously relaxed reporting requirements for the issuance of stock options. Until recently, managers had 40 days to report the granting of stock options, this allowed for plenty of time to manipulate the grant date. The act of backdating is not considered fraudulent, but not reporting it to investors is illegal in the United States.

SOX legislation significantly reduces the amount of time firms have to report

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the granting of options from 40 days to 48 hours. Narayanan and Seyhun (2006) provide evidence that backdating was quite prominent among

American companies. Firms which waited for longer periods of time to report the issuance of stock options tended to have a greater price increase during the period after the options were granted. They also find that the post-grant date stock returns are lower after the SOX regulation was put in place. This argues that before SOX, backdating was rampant. It also argues that the SOX provision has reduced the firm's ability to profit from such a practice.

The results from the research of Narayanan and Seyhun (2006) provide evidence of an even more disturbing possibility: that the firm is choosing the option date to coincide with the release of favourable firm-specific information. Such activities are clearly problematic and serve to undermine the integrity of financial markets.

There have been many recent prosecutions of American companies who are alleged to have participated in backdating schemes. Companies as prominent as Apple Computer have been the subject of a recent investigation into their behaviour by the Securities and Exchange Commission (Schwanhauser/Poletti, 11 June 2005). Many of the American companies subject to the probes are in Silicon Valley, the home of many high tech firms. At least one in every seven of the 150 largest firms of Silicon Valley has been subject to the recent investigation. This is not surprising, given the fact that these firms are among the most likely to use growth options for employee compensation, saving valuable cash for positive NPV projects.

The prosecution of high growth firms under SOX is disturbing for two reasons. First, many of these firms are small, and small firms already experience the greatest cost (as a percentage of assets) of SOX compliance, leading to greater risk of financial distress. Second, this valuable high growth industry may suffer impediments to investment and growth as a result of SOX compliance costs and the inability to compensate managers with options. So, while SOX regulations have increased investor protection, the amount paid for this protection may ultimately hurt US financial markets and corporate ingenuity.

*Boyce D. Watkins*

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