



# Special Stock Option Watch

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Do stock option programmes increase the performance of managers? Do they, however, also tempt to balance sheet manipulations? The positive and negative effects of stock option programmes on the management incentives are the focal point of the second edition of *Stock Option Watch*. Further we compare the tax regulation systems of selected countries and highlight the theoretical fundamentals of option valuation.

The first article represents the findings of a ZEW survey which analyses the effects on the motivation of performance-related payments. The importance of market-value-linked compensations of managers in German companies is in the centre of the second article. The third article examines closer the potential negative aspects of stock option programmes. Thereby

it appears that companies listed on the former Neuer Markt stock segment, which had stock option programmes, became relatively seldom insolvent and also exhibited a relatively low number of cases of balance sheet fraud. In the fourth article taxation practices of stock options are compared internationally. In the fifth article the theoretical fundamentals of the Black-Scholes equation are discussed. Here the focus is on the relevance of risk preferences for option valuation.

We wish you a pleasant and useful reading.

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## Not only Material Incentives Enhance Managers' Motivation

Performance-related incentive payments as part of the employees' remuneration system play a significant role as a motivation-enhancing instrument in many companies. We argue that not only the performance-related elements of a remuneration system increase the employees' motivation. The acceptance of the remuneration system, the transparency of the remuneration policy, the variance of the payments and the feeling that the level of payment depends on the employees' own effort are also essential.

Teamwork and increasing integration of the production process make it more and more difficult to assess the individual performance of employees. Therefore, an increasing number of businesses is trying to influence the motivation and effort of their employees indirectly by

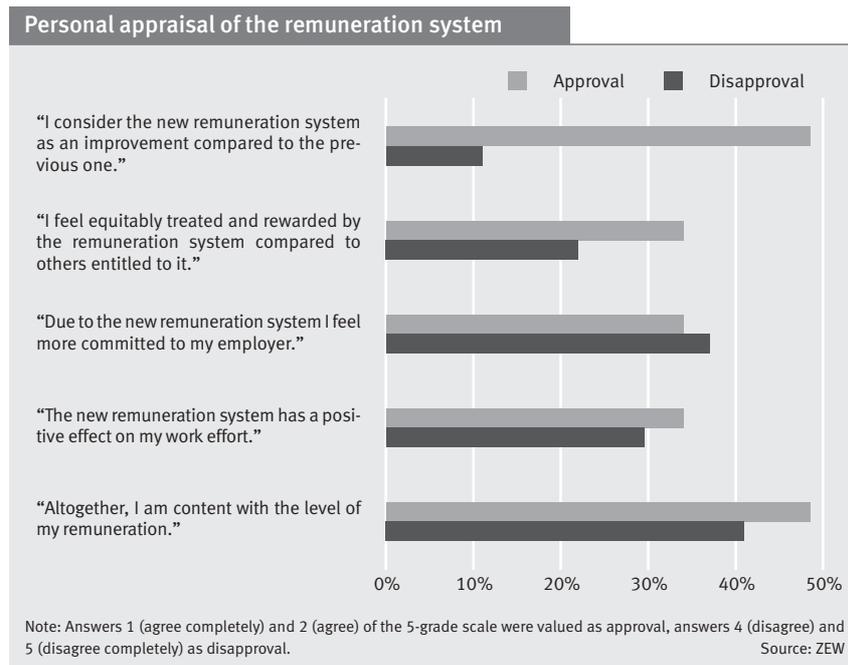
material incentives instead of direct performance control and supervision. This is particularly true with regard to the remuneration of top managers whose decisions and performance have a significant and strong influence on the competitiveness of the company.

### **Design of the remuneration system influences motivation**

A very extensive literature on that topic shows that material incentives can increase the motivation and effort of managers. However, it is hardly known what effect the design of the remuneration system has on the top managers' performance. A paper of the Centre for European Economic Research (ZEW Discussion Paper No. 02-72) therefore

concentrates on the question, which features of a remuneration system and its performance-related elements have a positive effect on the top managers' attachment and motivation. The paper is based on a ZEW-survey conducted amongst the top managers of an internationally renowned company from the chemistry sector and additional employees' data of this company. The managers were asked to respond to a new bonus-related rewarding system introduced in the company. In total, 23 questionnaires were evaluated, which corresponds to a response rate of 55 percent.

The evaluation of the new remuneration system by the top managers is highly diversified (see figure). On the one hand, many of them regard the new system as an improvement compared to



the previous one. On the other hand, however, most of them consider the fairness of the new remuneration system worse. Furthermore, most of the managers refer to mixed implications of the new system on the working effort and their attachment to the company.

How can we explain the very contro-

versial evaluation of the remuneration system? Analogue to previous results from literature, higher payments resulting from the new system appear to have a positive effect on the employees' acceptance as well as on their motivation. The general acceptance and approval of the employees concerned are a crucial

prerequisite for the assumed motivation effect, however. Top managers who have a positive attitude towards the new remuneration system have also a relatively higher motivation, in fact, independent from the actual premium payment. The managers' motivation and acceptance are lower if they regard the premium as exposed to strong variation and dependent on factors that are not under their control. Finally, a slight difference between the expected and the actual premium payment, as well as the information given during the introduction period of the remuneration system influence positively the employees' acceptance of the remuneration system. If considered together in a multivariate data analysis, the non-monetary factors in the survey also have a significant impact on motivation and acceptance. Thus, the introduction of a performance-related remuneration system is by no means a "free lunch" – extra commitment of the managers can be achieved only with their acceptance and approval of the remuneration system or consistently increasing payments.

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## How to Improve Market Value-Related Compensation in Diversified Companies

There are two arguments that strongly support the market valuation of individual subsidiaries or business units of diversified listed companies. The first relates to the conglomerate discount, the second to market value-based remuneration and stock option plans. In contrast to the US, the subsidiary of a German company can only be valued separately when it is spun off. Thus, there is an argument in favour of so-called "tracking stock" as a further alternative that could provide German companies with wider range of equity instruments.

The first argument is due to the fact that the market value of diversified listed

companies is substantially affected by the financial results of the individual subsidiaries and business units that form the listed company. Often, the market value is further adjusted by a premium or a discount due to the diversification. Various surveys show that, on average, there is a conglomerate discount. (See e.g. the survey of US companies by Rajan, R.G.; Servaes, H.; Zingales, L., 2000, The cost of diversity: The diversification discount and inefficient investment, *Journal of Finance* 55, 35-80 and Billet, M.T.; Mauer, D.C., 2000, Diversification and the value of internal capital markets: The case of tracking

stock, *Journal of Banking and Finance* 24, 1457-1490. See also Graham, J.R.; Lemmon, M.L.; Wolf, J.G., 2002, Does corporate diversification destroy value? *Journal of Finance* 57, 695-720.) In order to avoid this discount it is necessary to have each individual business unit of a conglomerate valued separately on the stock market. In other words, the conglomerate is to be split in an adequate way.

There is a second argument that supports such a splitting up. It refers to the incentives for the managers of the different branches of a listed company. In the case of stock option plans, the market

value is the basis for the managers' remuneration. This seems reasonable for as long as the remuneration of the executive board is concerned since it has the responsibility for the whole conglomerate. But it appears to be problematic if the remuneration of managers of separate branches or subsidiaries is linked to the market value of the conglomerate as a whole. Although such a branch manager can hardly affect the business of other branches of the conglomerate, his/her market value-related remuneration depends significantly on the other branches' results as well. It follows directly that these managers' compensation is tied to (financial) results, which are beyond their responsibilities. The connection between the influence on the stock price and the remuneration is disturbed. Nevertheless, in many listed companies, managers of subsidiaries and business units also belong to the beneficiaries of stock option plans. This is inappropriate since remuneration can only be related to market values if there is a market value for each single business unit or subsidiary. What is needed to observe such market value is a market for each (larger) subsidiary or business unit of the conglomerate. This market can be created by either a spin-off or the use of tracking stock.

### Spin-off of a branch

In the case of a spin-off, a branch is completely legally separated from the parent company. It is then listed as a separate company on the stock market. In the case of a spin-off, the equity claims of the derived company are handed over to the current shareholders of the parent company who might trade in these claims in a newly established market. In the case of carve-out, the parent company sells these equity claims to a third party. Normally, after a spin-off the share of the parent company in the newly listed firm is very low, in the case of carve-out, in contrast, it is relatively high. Therefore, the focus here is rather on spin-offs. The parent company abandons both ownership and control over the unit; the spun-off branch becomes an independent company on the stock market. The connection between managers' activities of the previous branch and the

valuation of that branch on the stock market is no longer influenced by the activities of the other branches of the parent company. In this way a clear improvement of the managers' incentives is achieved.

For example, when Siemens AG reorganised its chip branch it created a legally independent entity and floated it under the name of Infineon AG. However,



Siemens initially kept more than 70 percent of Infineon's shares, so that it retained the ability to exert significant influence on Infineon.

In the US, the creation of tracking stock is another option. It was used, among others, by AT&T, Disney, and General Motors. Tracking stock is a particular form of equity that provides a claim on the residual cash flow created by the particular business. These cash flows may be dividend payments or other payments linked to the financial results of the business concerned. Tracking stock is a very flexible instrument since the related rights and obligations can be arranged individually when issued. However, ownership and right of disposal of the underlying assets are not affected by tracking stock; they remain with the parent company. For this reason, possible synergy effects between branch business and parent company could still be exploited. In contrast, these synergy effects are lost in a spin-off.

However, there are also some disadvantages of the use of tracking stock compared to a spin-off. It is primarily due

to the variety of claims that can be created in the case of tracking stock that the capital structure of the conglomerate becomes more complex. Furthermore, the external reporting obligations of the conglomerate become more demanding since it is required that the branch business creates its separate reports for settling the financial claims of the tracking stock owners. This reporting is also under re-

gulation by the Securities & Exchange Commission (SEC). The fact that rights and obligations of tracking stock may differ from one company to the next has not only the advantage of being more flexible but also the disadvantage of hindering the communication between the conglomerate and the capital market (investor relations). Furthermore, the use of tracking stock might result in a shift of assets between the tracked unit and the parent company since the holders of the tracking stock are rather in the position of minority shareholders.

The choice between tracking stock and spin-off has to balance these arguments. It is crucial how efficiently the internal capital market of the conglomerate works compared to the external one. At the outset, the conglomerate itself issues and manages its equity and debt claims. The capital raised is allocated among the business units through the internal capital market. In the case of spin-off, the external capital market replaces the internal one entirely since the previous business unit becomes an independent company that is itself traded

on the (external) stock market. In contrast, the use of tracking stock combines elements of both the internal and the external capital markets. The external market is important because of the valuation of the branch and the opportunity to issue more tracking stock. Moreover, the funds generated by the business unit are (partially) transferred to the external capital market, namely to the owners of the tracking stock. However, the unit is involved in the internal capital market as well since it could receive loans and guarantees from there. In addition, it is also liable with its assets for the debt of the conglomerate. To what extent the internal or the external capital markets are prevalent depends on the specific design of the tracking stock.

For the managers of the parent company there is another argument. Typically, their remuneration increases with the size of the conglomerate. Therefore, their incentive for downsizing the conglomerate through a spin-off should be rather small. This could be a reason why managers prefer tracking stock.

Regarding the effect of stock options as an incentive device, obviously, a

spin-off places the clearest incentives since the market value of the business unit is the single determining factor. In the case of tracking stock, however, further undesirable incentives could arise from the internal capital market.

### Different development of the market price

Empirical results indicate that there is no clear difference in the development of the market price after spin-off or tracking stock issue. (See Chemmanur, Th.J.; Peaglis, I., 2001, Why issue tracking stock? Insights from a comparison with spin-offs and carve-outs, *Journal of Applied Corporate Finance* 14, 102-114. The return on assets from ordinary operations is the benchmark for profitability in a study by Boone, A.; Haushalter, D.; Mikkelson, W., 2003, An investigation of the gains from specialized equity claims, *Financial Management* 32, 67-83.) Hence, the empirical results from the US do not seem to establish a general preference of the shareholders of the conglomerate in favour of tracking stock or a spin-off. It is, however, debatable whether these

findings are relevant for conglomerates in Germany. There are still considerable differences in the functioning of the external capital markets. It is also quite likely that the internal capital markets of the conglomerates in these two countries work in a different and unequally efficient way. Therefore, it cannot be ruled out that tracking stock in Germany could provide a better capital structure compared to a spin-off or to the status quo.

Currently, tracking stock are not permitted in Germany such that German conglomerates do not have the option to use them to optimise the incentives for their managers. However, it is well possible that tracking stock provide better incentives and a superior capital structure for some conglomerates compared to a spin-off or to the status quo. Therefore, German companies should be allowed to issue tracking stock. There are no obvious reasons why the legislator should not allow companies and the capital market to adopt new, more flexible instruments that might increase market values and, at the same time, optimise incentives for managers.

*Axel Adam-Müller*

## Option Programmes For Top Managers and Scandals on the Stock Exchange

In the discussion about the problems with stock option programmes it is consistently referred to the scandals on the stock exchanges. Hall and Murphy (2003) draw the conclusion that the scandals with Enron, WorldCom or Global Crossing are closely linked to the placement of Stock Options, because this focuses the managers far too tightly on the stock price. Franke (2003) also presumes that the recent balance sheet affairs are result of the excessive allocation of stock option programmes. As a matter of fact managers who possess significant stock option portfolios have considerable self-interest to exercise them at a high profit. To get to the required high stock price, managers can use

besides the favoured corporate strategy also manipulations and acceptance of excessive risk. (Hess and Lüders 2001, Franke 2003).

A careful look at the companies listed on the Neuer Markt reveals interesting but also ambivalent findings. It can be displayed statistically by means of simple cross-classified-tabulating that stock exchange scandals in fact depend on the existence of stock option programmes for CEOs. However, a positive effect of the stock option programmes appears as well. In the following, we want to make it evident that the following features “delisting from the Neuer Markt”, “stock exchange scandals” and “corporate insolvency” are not statistically independent

from the existence of stock option programmes for CEOs. Using these three features we are going to exemplify the ambivalent impact of stock option programmes – on motivation and also wrong incentives from the viewpoint of shareholders.

### Delistings from the Neuer Markt

The fact that until the beginning of 2000 relatively fewer companies were delisted from the Neuer Markt compared to NASDAQ can be explained by the high quality requirements of the German Stock Exchange (Deutsche Börse) and the above-average quality of the listed companies. However, this image has

changed rapidly in the following years when the percentage of delisting companies perfectly matched the US-standard. The main reasons for delisting from the Neuer Markt were violation of the rules on the German Stock Exchange, withdrawal of the corporate designated sponsors, insolvency or acquisition, or also voluntary retreat, if costs of the listing exceeded the expected revenues. Generally, delisting has a negative effect on the

### Stock option programmes and insolvencies

Even though the effect of stock option programmes on the management incentives has been over and over critically discussed (Bebchuk and Fried 2003), there are good theoretical reasons for their application. The strongest incentive for a CEO could be in his/her effort to avoid the insolvency of the company, since in

a positive effect of stock option programmes on the CEOs' incentives.

The picture is somehow different considering "fraud" as criteria. Till the beginning of 2003, 35 companies have attracted attention either because of violations of stock laws or due to balance sheet fraud and manipulations (the considered companies have not been prosecuted yet). Here is also evident that both criteria are not independent from one another (error probability less than 0.1 percent). Though more than half of the cases of fraud is with companies with stock option programmes (57.14 percent), proportionately the outcome is different: Only about 10 percent of the total companies considered with CEO options were involved in fraud, whereas that was the case for about 20 percent of the total companies considered without stock options. Consequently, the statistical dependency between fraud and stock option programmes cannot be clearly determined, at least not in the case of our considered companies.

**Table 1: Stock option programmes and delisting of the Neuer Markt**

	without CEO-options	with CEO-options	total
no delisting	33	170	203
delisting	37	33	70
total	70	203	273

Source: own research

share price in the long term. The share is traded onward only on one market with less reputation and therefore drops out of the analysts' and investors' main focus as well. For a CEO with a stock option programme this means a long-term disadvantage, if not a complete loss of her/his options.

From our base of 273 German Corporations that are not holdings and banks, and that were not listed previously on another market segment, 203 have stock option programmes for their CEOs. Until the end of 2002, altogether 70 companies were excluded from the Neuer Markt. If there were no dependency between stock option programmes and numbers of delisting, the number of delisted companies with stock option programmes should be relatively uniformly distributed among the total delisted companies. Statistically that is not the case, which is represented in the cross-classified Table 1. From the 70 delisted companies nearly 52.86 percent do not have stock option programmes and 47.14 percent do have stock option programmes. Proportionately it becomes obvious, however, that only a bit more than 16 percent of the companies with stock options were delisted from the Neuer Markt – as opposed to 52 percent of the companies without stock option programmes for their CEOs. Here the Pearson's chi-square test shows a significant value with an error probability smaller than one per cent.

the case of insolvency all of his/her stock options expire. Therefore, CEOs with stock options should have a significant incentive to avoid insolvency. As Table 2 shows, we cannot completely reject that assumption. Sixty-five per cent of the 26 registered insolvent companies do not have stock option programmes. It is clear that also in that case the features "insolvency" and "stock option programmes" are not statistically independent (error probability less than 0.1 percent). Whereas less than 5 percent of the companies with stock option programmes became insolvent, that was the case for almost 25 percent of the considered companies without stock options for their CEOs. That outcome suggests again

### Effect of stock options on managers' incentives

From the three examples discussed obviously no ambivalent or hardly ever negative effect of stock option programmes on the CEOs arises. So our findings imply an effect of stock options on managers' incentives, which entails less manipulations and insolvency avoidance. Finally, the discussed question is not one of a causal effect, but solely a statistical

**Table 2: Stock option programmes and insolvency**

	without CEO-options	with CEO-options	total
no insolvency	53	194	247
insolvency	17	9	26
total	70	203	273

Source: own research

**Table 3: Stock option programmes and fraud**

	without CEO-options	with CEO-options	total
no fraud	55	183	238
fraud	15	20	35
total	70	203	273

Source: own research

verification of the independence of the regarded characteristics (for a more comprehensive analysis see Lehmann, Lüders, Lüders-Aman, 2003). So it could be possible to suggest that the decision against introducing stock option programmes, which is not part of this short study, is also governed by the expected behaviour (here: manipulation, imminent or actual financial problems).

With Stock Option Watch we wish to focus more attention also in Germany on the possible effects of stock option pro-

grammes. Not to mention that at present there is no alternative to the stock option programmes.

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## The Taxation of Employer-Provided Stock Options in Selected Countries

With the rise of the new economy and a growing number of companies relying on stock options to compensate their employees, a discussion has arisen on how these employer-provided stock options are to be taxed. Many countries revised regulations concerning the taxation of stock options in order to attract more investment in start-ups. Internationally, the taxation of stock options is not uniform. The following article gives an overview of tax regulations in selected countries and provides a quantification of those regulations' influence on the tax burden of highly qualified employees. It is divided into two parts. In the present issue of the Stock Option Watch, we present a survey on tax regulations. In the next issue, we will present the quantification of the influence on the tax burden.

There are several forms of employer-provided stock options, which can be classified into tradable options and non-tradable options. Since employers grant stock options as a long-term incentive, usually certain conditions have to be met before an option can actually be exercised. Often, this takes the form of a holding period during which the options are not exercisable. Such non-tradable

options are subject to special tax treatment, as will be shown in the following. The tax regulations in the six countries we analyse here differ with respect to the date of taxation, the valuation of the options, and the existence of specific tax privileges. The survey covers Switzerland (esp. the canton of Zurich), the Netherlands, Germany, Austria, the United Kingdom, and the United States.

#### Date of taxation

From a theoretical point of view, there are four possible dates when non-tradable stock options can become subject to tax: at the date of grant (as in Switzerland), vesting (as in the Netherlands), or exercise of the option (as in Germany and Austria), or at the date of the sale of the share (as in the United States and the United Kingdom).

In Switzerland stock options are principally taxed at the date of grant. Realised gains or losses at exercise do not affect taxes paid in the period of grant and are tax exempt. However, the holding period may not exceed five years. Otherwise the stock options are subject to tax in the period of exercise. In November 2002, a decision by the court of the can-

ton of Zurich changed the date of taxation. Employer-provided options are now taxable at the date from which on the employee cannot forfeit the granted options any more. A stock option granted under the condition that the employee still works at the company at the time of exercise would then be taxable at the date of vesting instead of the date of grant. For the time being, this regulation is only valid for the canton of Zurich. In the Netherlands, where employer-provided stock options become taxable at the date of vesting, the employees can opt to be taxed at the date of exercise.

The valuation of the stock options differs with the time of taxation as well as with certain tax privileges. Generally, the value of the employer-provided stock option is equal to the difference between the fair value of the share at exercise and the actual price paid by the employee. Where there are tax privileges in a country, the exercise price may not be below the fair value of the share at the date of grant.

To determine the tax payment in Switzerland, the fair value of the share at exercise has to be estimated with the method of Black and Scholes. The resulting value of the option is then modified depending on the vesting. For options

with a holding period of five years, the value is reduced by 25 percent. In the Netherlands, the value is equal to the fair value of the share at vesting less the actual price at exercise. In Austria, employer-provided stock options are tax privileged up to a fair value of 36,400 Euro. The tax exempt benefit is a percentage depending on the number of years the options are held after the grant date. For each year, ten percent of the benefit are tax exempt, up to a maximum of 50 percent. In Germany, stock option plans do not receive a special tax treatment. The United Kingdom and the United States provide certain tax privileged stock option plans. In the United Kingdom, the options granted under an approved company share option plan (CSOP) may not exceed the value of 30,000 Pounds and the vesting date has to be at least three years after granting. Incentive stock op-

tions in the USA also have to meet certain requirements concerning the holding period. The taxable value of qualifying stock options in both countries is the price of the shares at sale less the exercise price.

### Benefit resulting from stock options

The benefit resulting from stock options is either taxed as employment income and as such underlies personal income tax, or is qualified as capital income and thus subject to capital gains tax. Stock options are subject to personal income tax in those countries that tax at the date of grant, vesting or exercise of the option. In the United Kingdom and the United States, where the benefit from stock options is taxed at the date of sale of the stock, the stock options

are subject to capital gains tax. The tax rates are below those of the personal income tax.

Stock options have an influence on the tax burden of highly qualified employees, because they are taxed in different periods or are tax favoured compared to cash compensation. The tax burden depends not only on the tax rate and the benefit of the stock options, but also on the date of taxation and the development of the share prices during this time. An increase in share prices will result in a lower tax burden in countries with an early date of taxation. The contrary is true for decreasing share prices. In the next issue, we will present the measurement of the influence of employer-provided stock options on the effective average tax rate of a highly qualified employee.

*Christina Elschner*

## On the Relevance of Preferences for the Pricing of Stock Options

The modern option pricing theory begins with the work by Black and Scholes (1973) and Merton (1973), who derived the first preference-free closed-form solution for the price of a stock option. According to the Black-Scholes valuation equation, the price of the option depends on five variables: the current stock price, the strike or exercise price, the maturity of the option, the riskless interest rate, and the volatility or standard deviation of stock returns. The first four variables are observable, while the volatility of the stock is relatively easy to estimate. Hence, in order to use the formula, we first obtain the values of these five variables, then we insert them in the Black-Scholes valuation equation, and as result we obtain the price of the option.

The Black-Scholes valuation equation is valuable because:

- It does not depend on preference parameters. This result is important since preference parameters are diffi-

cult to estimate. The option pricing equations derived previously to the Black-Scholes (1973) work depended either on preferences or other arbitrary parameters that are difficult to obtain.

- It does not depend on the location parameter of the stock price distribution (i.e. the actual expected return under their assumption that stock returns are normally distributed). This is relevant since the location parameter is, in practice, difficult to estimate precisely.
- It is compatible with risk-neutrality; i.e. a world where all assets yield the riskless rate of return. No risk-premium affects the equation. This is important since risk-premiums are also, in practice, difficult to estimate.
- It is obtained under no-arbitrage conditions and, therefore, sustained by some equilibrium economies.
- It is obtained in closed-form and,

therefore, easily applied in practice. According to Rubinstein (1994), “the [Black-Scholes] model is widely viewed as one of the most successful in the social sciences and [is] perhaps (including its binomial extension) the most widely used formula, with embedded probabilities, in human history”.

The first of these five characteristics is not a surprising result given the assumptions of Black and Scholes (1973). These authors assume that there are no arbitrage opportunities in the economy, and that the stock and options written on the stock might be continuously traded. Under these assumptions it is possible to construct and to maintain a riskless portfolio (involving the stock and the option) which, since it is riskless, yields the riskless rate of return. From a mathematical point of view, this is a partial differential equation whose solution is the Black-Scholes valuation equation. Since prefe-

rence parameters do not enter into the problem, it is not surprising that preferences do not affect the price of stock options.

Since its early stages the Black-Scholes model has received a great deal of attention from academics and practitioners. One branch of the literature has investigated the investors' attitudes towards risk and, in particular, the type of risk aversion that can sustain the Black-Scholes formulae in the pricing of stock options. This branch of research is interesting because it shows conditions on preferences and distributions that lead to the Black-Scholes option price when it is not possible to construct and to maintain a dynamic riskless portfolio. It is costly to trade dynamically stocks and options written on the stock and, therefore, it is also important from a practical point of view to know that the Black-Scholes equation holds under alternative assumptions to the dynamic riskless hedge assumption.

The earlier literature was almost unanimous in relating a power utility function with the Black-Scholes valuation model. Under such a utility function, which displays constant proportional risk aversion (CPRA), the percentage invested in risky assets is unchanged as the wealth of the investors increases. For example, Rubinstein (1976), Breeden and Litzenberger (1978), and Brennan (1979) remark that the Black-Scholes model can be obtained in an equilibrium economy, when agents have power utility functions characterised by CPRA and aggregate wealth and the stock price are joint lognormally distributed. Unfortunately, empirical and theoretical research has cast doubts on the reasonability of the CPRA assumption. There are many authors who believe that investors, instead of CPRA, display other types of preferences.

Recently, Camara (2003a, 2003b) and Camara and Stapleton (2001) show that the Black-Scholes valuation equation also holds with many other types of utility functions or preference functions. Therefore, Camara (2003a, 2003b) and Camara and Stapleton (2001) derive many equilibrium economies that sustain the Black-Scholes valuation equation even if it is not possible to construct and to maintain a riskless portfolio. The practical implication of this is that, even if dynamic trading is not possible, there are still many situations where we can use the Black-Scholes valuation equation.

*Antonio Camara*

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