

# Strategic Compensation Design: Equity and Stock Option Compensation Effects on Firm Performance and the Contribution of Risk

8.6.2022

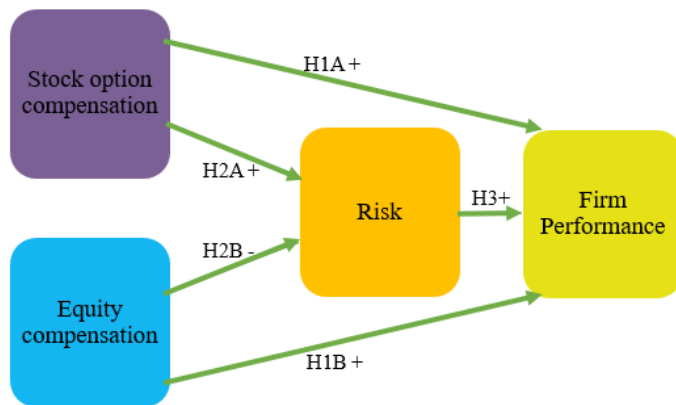
Bachelor of Science

Leonard Merlin Lechner  
leonard-lechner@online.de

**Purpose/Motivation:** In the last decades, companies have developed a variety of compensation forms for incentivizing executives. Usually, these incentive plans include long-term stock, as well as stock options for this purpose. This study aims to explain the strategic use of compensation components by combining findings from Agency Theory, Expectancy Theory and concepts of Corporate Finance. Although recent scholars have already explored the effects that equity and stock option compensations have on risk and firm performance, a combined analysis considering a mediating effect of risk is still missing. To fill this gap, this mediating role is theoretically derived and empirically examined in this study.

## Theories/Hypotheses:

Figure 1: Overview of the Theoretical Model



In Figure 1, an overview over the different relationships that will be explained by the hypotheses is provided. The model implies that risk mediates the equity and stock option compensation effects on firm performance so that the direct effects should become smaller when risk is controlled for.

It is empirically supported that there is a positive effect on firm performance through equity ownership (Frye, 2004; Jensen & Murphy, 1990; Mehran, 1994) as well as stock option compensation (Hillegeist & Penalva, 2003; Jones et al.; Sanders, 1999). Assuming that these prior results are generalizable, the empirical results in this study can be expected to be similar so that both compensation forms influence firm performance positively.

*Hypothesis 1a: Stock option compensation will have a positive effect on firm performance.*

*Hypothesis 1b: Equity compensation will have a positive effect on firm performance.*

According to prior research, stock option compensation is positively associated with risky investments such as R&D investments or capital and acquisition investments (Billings et al.,

2020; Sanders & Hambrick, 2007). This implies that firm risk will increase when executives are compensated with stock options.

*Hypothesis 2a: Stock option compensation will have a positive effect on firm risk.*

The incentive compensation function of equity can be seen as a call option payoff function with a strike price of zero, so that there is no need for taking on excessive risk to profit from holding equity to exceed the strike price in order to gain a positive outcome (Tirole, 2006). Drawing on the results that holding equity increases risk-aversion (Parrino et al., 2005), reduces risky M&A investments (DesJardine & Shi, 2021) and strategic firm risk (Devers et al., 2008), compensating executives with equity can be expected to have a negative effect on firm risk.

*Hypothesis 2b: Equity compensation will have a negative effect on firm risk.*

It is possible to utilize an investment-based approach and measure risk with R&D and capital expenditures as risk measures, which have a positive effect on risk. To account for the risk of default, debt is often included as a risk measure, its effect on firm performance, however, is unclear. Further, risky investments are impeded by high risk-aversion, but they usually reflect in higher firm performance. In total, firm risk should have a positive effect on firm performance, as investments alter both risk and performance and the impact of debt might not be high.

*Hypothesis 3: Firm risk will have a positive effect on firm performance.*

**Approach/Methodology:** The analyses in this study are conducted on a panel data set provided by the Institute for Human Capital Management at the Ludwig-Maximilians University Munich. This sample combines compensation data from ExecuComp as well as company data and controls by Compustat from various industries covering the years 2006 until 2017, resulting in a total of 8,413 observations. The Hypotheses were tested using fixed effect models that estimate effects occurring within an entity. In this analysis, the company ID and year are used as unique identifiers/index, so that the estimates in the regression models are interpreted as individual effects occurring within companies.

**Findings:** Despite option compensation not showing any significant effect in the regression analyses, equity compensation affects firm risk positively and performance negatively, assuming linear relationships. Firm risk explains the negative effect equity compensation has on performance, at least partially, as this effect is weakened when including risk. Considering a parabolic relationship between equity compensation and performance, the negative term even loses its significance when firm risk is included. As a result, firm risk mediates the effect of equity compensation on performance.

**Research Limitations:** Executives are expected to be rational and the assumption that executives can control firm risk and the performance of the company may not hold completely. In addition, Expectancy Theory does not include aspects like teamwork, status or power in the definition of motivation and not controlling for managerial risk-aversion and other individual characteristics such as wealth, motivation, ability or personality traits potentially causes several problems. Lastly, only accounting-based performance measures were used and these together with the risk measures were not industry-adjusted whereas in practice, the compensation effects might differ a lot across different industries.

**Research Implications:** Even if none of the hypotheses could be supported directly, which in turn could imply that the relationships are not linear but more complex, it was empirically shown that risk can be seen as a mediator partially explaining the relationship between equity compensation and performance. Additionally, it was found that compensating an executive with equity compensation might not be pareto-efficient as the relationships between this compensation form and both risk and performance appeared to be parabolic.

**Practical Implications:** Option compensation has lost relevance and it stays unclear if there still is a negative and linear relationship on the overall performance, affecting risk positively as stated in early research. Compensating executives with equity may not be efficient due to the complex relationship between stock awards and performance. Although the same performance could theoretically be reached by a lower amount of equity compensation, rewarding an executive with a high amount of equity should lead to a high ROA. Option and equity compensation do not seem to be substitutes, meaning that firms should further include both compensation types complementarily in the executives' reward mix.

**Contribution:** This study takes a first step in not assuming simple linear relationships between executive compensation and performance, as it considers parabolic relationships and examines a mediating role of risk.

**Paper type:** empirical

**Further readings:**

Lovett, S., Rasheed, A. A., & Hou, W. (2022). Stock options, restricted stock, salary, or bonus? Managing CEO compensation to maximize organizational performance. *Business Horizons*, 65(2), 115–123.

Sanders, G. (1999). Incentive structure of CEO stock option pay and stock ownership: the moderating effects of firm risk. *Managerial Finance*, 25(10), 61–75.