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CEO Incentive Plans Improvement in the U.S. Public Companies on the Base of Game Theoretical Modeling*

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Abstract The paper is aimed at improving the mechanism of forming the variable part of CEO compensation. The novelty of the given research paper is improving the methodology of evaluation the value of variable part of CEO compensation with the chosen model, so it can be applied on practice. The model is game theoretical interpretation of the principal-agent phenomenon whose objective is to model the variable part of CEO compensation to stimulate strategy implementation In detail, 14 company cases of the U.S. public companies in retail and technology industries were presented, the applicability of the model was proven and suggestions for methodology improvement were made.
Keywords: corporate governance, agency problem, CEO compensation, game theory, theoretical modeling, U.S. public companies.

1. Introduction

The research deals with the problem of CEO compensation value modeling which is one of the core issues of corporate governance. In theory, contracts should be designed by boards of directors to maximize company value. Contacts should attract and retain talented CEOs, incentivize them to exert high level of efforts to implement the company's strategy and ensure its competitive advantage.

To begin with, CEO compensation structure usually consists of base salary and variable part. Base salary of CEO is less dependent on performance compared to variable part of compensation and is usually determined by the reputation of a manager, his experience at managing companies, size of a considered company, certain industry specifics and the level of CEO base salary across the chosen industry. Contrary, variable part of CEO compensation is directly dependent on performance of a company. According to Frydman and Saks (2010), a variable part of top management compensation in form of option grants and cash bonuses has been prevalent since 1950s in the U.S. public companies.

Traditionally, a variable part of executive compensation is considered as a tool for solving the agency problem, that is caused by the conflict of interests between an agent (CEO) and a principal (company owners). Principal owns capital and delegates responsibility to manage it in his/her interest to the agent, however, because of the conflict of interests in separation of profits gained by the company between two parties, temptation of ex post opportunistic behavior occurs for the agent. That is why the mechanism of determining the value of variable part of CEO compensation, which eliminates motivation for opportunistic behavior, should be worked out.

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There are quite a lot of scientific studies on the topic of executive compensation studies. Prevailing optimal contract theory (pioneered by Holmstrom (1979), Grossman and Hart (1983)) claims that a compensation program can be constructed so that interests of shareholders and CEOs are aligned and the most talented CEOs at a competitive market are attracted and retained due to fair remuneration of their talents and efforts. On the other hand, managerial power theory (Bebchuk and Fried, 2004) argues that high value of executive compensation is the result of CEOs' rent-seeking behavior.

Despite vast research conducted on the matter of executive compensation, none of the existing theories offers a fully coherent explanation for historical evolution of executive compensation during the 1970s, some of the cross-sectional and time-series patterns in the data, and provides a convincing mechanism designing consistent compensation programs. Thus, the goal of the research paper was to improve the mechanism of forming the incentive plan of CEO compensation based on the existing theoretical models and approaches, and test the applicability of this mechanism for the U.S. public companies.

Mandatory disclosure of executives' compensation in the U.S. public companies added transparency to the issue in question in 1992 and mirrored disconnect between pay of executives and average employees. Additionally scandalous cases such as Enron, Tyco and WorldCom of the early 2000s and the Great Recession concluding the late 2000s attracted more attention to corporate governance issues, raising a question of necessary cuts in compensations and more rigorous monitoring of the CEO activities. In the 2000s compensations still remained generous but decreased in value in comparison to the peaking year 2000. One example of outrageous compensation is a case of the former J.C. Penney CEO compensation that in 2012 amounted to 53.5 million USD and exceeded an average worker wage by 1795 times

The U.S. publicly traded companies (without a controlling shareholder) were in focus of our analysis. Confirmed by research and scandalous media examples, when ownership and management are separated (like in public companies), CEOs might abuse substantial power to enjoy individual benefits without putting additional efforts into the company management.

Even though ownership structure in U.S. and Russian public companies is different, (scattered ownership in the U.S. vs. concentrated ownership in Russia) conclusions derived from the analysis of the U.S. compensation programs could be applied to some extent in the Russian environment.

2. Executive compensation problem

The subject of the research is executive compensation (interchangeably: compensation program or compensation package) for CEOs that incentivizes top managers to align their efforts with owners' expectations. Therefore, we refer to corporate governance, a system by which companies are controlled, directed and made accountable to shareholders and other stakeholders (Demirag, 1998). Since the emergence of formalization of the problem, academic literature on the subject has been enormous, spanning around accounting, finance, economics, law, strategy, organizational behavior and other disciplines.

As was mentioned earlier, the modern history of executive compensation research was evolving in parallel with theory on the principal-agent problem that was starting to be generally accepted in the early 1980s. To apply principal-agent approach

to our research, we stated that under the agent we understand the CEO (interchangeably: chief executive or top manager) and under the principal we understand the shareholders and their proxy – the board of directors.

Both parties have utility functions. The utility of the principal depends on behavior of the agent: he wants the agent to behave in a way that maximizes his own, the principal's, utility. Since the agent maximizes his own utility and ownership stake in the company is rather small, his actions may contradict the interests of the principal who owns the company and would like its value to be maximized. Information asymmetry prevents the principal from obtaining direct information on the agent's efforts and actions. The agent's utility is assumed as his compensation less opportunity costs, a.k.a. efforts put into value creation, whereas the principal's utility function is the return on investment or value of the company.

Separation of ownership and control within the company is a cornerstone of corporate governance; it has been a central concern since the early 20th century (Berle and Means, 1932); therefore, the main driver of public companies analysis. Different problems arise due to the fact that interests of owners and managers vary whereas corporate governance tends to resolve these conflicts between different stakeholders in a public company (Kenneth, Nofsinger, 2004).

Another important aspect of executive compensation research is sensitivity to the company performance (pay-performance sensitivity). The earlier group of studies tried to find dependencies between changes in executive compensation and stock prices and was criticized to concentrate only on current remuneration but not on executive cumulative wealth (Murphy, 1985; Bernston, 1985). Jensen and Murphy (1990) integrated various factors and assessed relationship between the company performance and CEO wealth for large U.S. public companies for the time period of 1974-1986 (dollar change in wealth for a dollar change in the company value). Hall and Liebman (1998) continue research proposing to assess dollar-percentage change (equity-at-stake as measure of CEO incentives). Thus different measures in assessment of pay-performance sensitivity lead to different magnitude of incentives. Baker and Hall (2004) demonstrate that the measure of incentives is dependent upon CEO operations-company value relationship. Since 1990s the strength of pay-performance hypothesis has been questioned by various researchers, remaining one of the major issues of the executive compensation theory.

The principal's payoff – shareholders value – is understood differently in different models. Older models generally tend to consider company profit as the value to be maximized whereas contemporary models usually follow ideas of value-based management, so shareholders seek for company value maximization. Therefore, modern models of executive compensation use market capitalization instead of profit as the principal's value.

Within the principal-agent problem, traditionally, CEO compensation is either an instrument to solve the principal-agent problem (optimal contracting approach) or is itself a part of the principal-agent problem (managerial power approach).

3. Executive compensation model

Theoretical model

Current research studies on executives' compensation investigate dependencies compensation and other variables, including performance. The limitation of these research papers is that these models are used as purely theoretical, intended to get

qualitative findings. As a result, there is lack of convincing explanations of compensation evolution starting from 1970s and explicit recommendations for construction of compensation packages, incentive plans in particular.

Under the requirements mentioned in theoretical background of the paper, a special theoretical model, developed by Casamatta and Guembel in 2007, was used in order to obtain quantitative results and practical recommendations for CEOs' incentive plan in 10 case studies. In their article Managerial Legacies, Entrenchment and Strategic Inertia Casamatta and Guembel consider two models. The first model implies one strategy for both periods but allows the principal to change the agent after the first period if he is not satisfied with his performance. The second model assumes that after the first period the principal can change the strategy and/or the agent. We have chosen a modified model since it appears more realistic. Usually after the first phase of strategy implementation if performance goals are not attained, the board of directors can question the effectiveness of the strategy and implementation efforts of the CEO.

The model is a game theoretical interpretation of the principal-agent phenomenon whose objective is to model the incentive plan of CEO compensation (performance-based pay component) to stimulate strategy implementation. The principal (owner, shareholder, investor) hires the agent (CEO, manager) to choose a company strategy to implement in the subsequent time, followed by the principal's decision to terminate or not the contract with the current CEO. The underlying assumption for the model is that the company strategy can be amended in both periods. In order to design the model the following assumptions were considered:

1. There are two players in the game – principal (owner / investor / shareholder; Board of directors can be a proxy for the owner) and agent (CEO / manager); interaction is happening within the company scope.
2. Interaction between shareholder and top manager happens during 2 periods, $t \in \{1, 2\}$.
3. At the beginning of the 1st period the principal hires the agent and signs a contract regarding his/her compensation, $w(R)$, where w is incentive plan of the agent's compensation and R is the Company performance during one period.
4. The agent can be of two types: H – high type and L – low type. The high type manager always chooses a successful strategy $S_0 = G$ whereas the low type manager chooses a poor, non-successful strategy $S_0 = B$. The probability that CEO is of high type H (before strategy implementation in the Company) is denoted as $q_0 \geq 0.5$ and called CEO's reputation. The type of CEO is not known to the principal or the agent him/herself. Reputation of the agent after the 2nd and the 1st period are denoted as follows: $q^{i,j} = prob\,(M = H \mid R_1 = R_i \text{ and } R_2 = R_j)$ and $q^i = prob\,(M = H \mid R_1 = R_i),\ i, j \in \{l, h\}$ respectively.
5. In order to execute the chosen strategy the agent has to choose whether to exert high or low efforts $e_1 \in \left\{\underline{e_1}, \overline{e_1}\right\}$; efforts are non-observable for the principal (which reflect the essence of the principal-agent problem). High level of efforts $\overline{e_1}$ means individual costs c for the manager. The difference between high and low levels of efforts is expressed by the following formula:

$$\triangle e_1 = \overline{e_1} - \underline{e_1}.$$

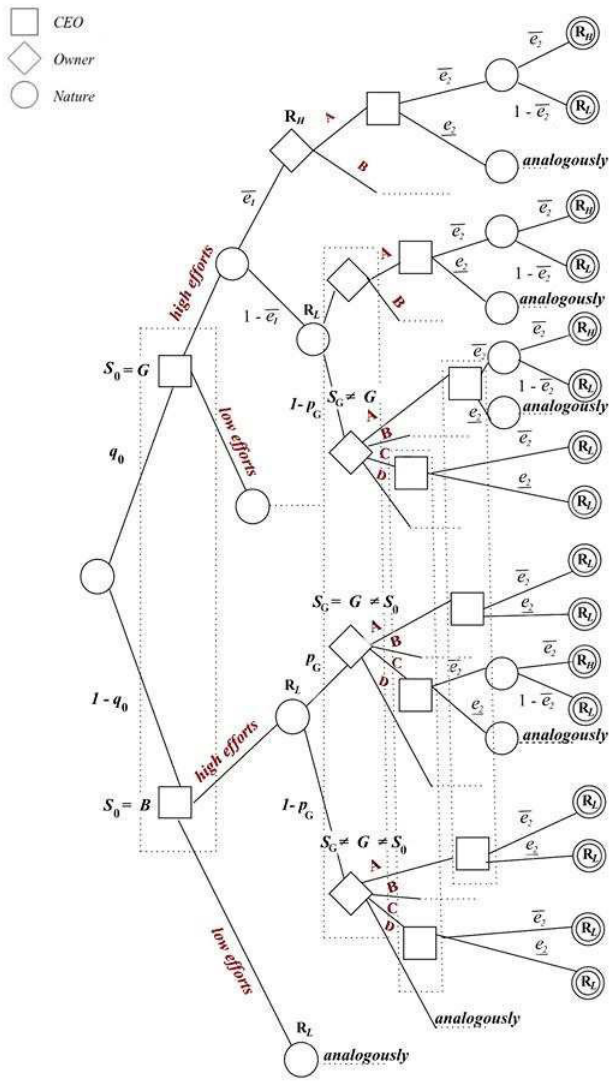

Fig. 1: Game tree

6. The nature also participates in the game. If CEO chooses the successful strategy $S_0 = G$, then the Company performance is high R_h with probability e_1 and low $R_l = 0$ with probability $(1 - e_1)$. If the chosen strategy is unsuccessful, $S_0 = B$, the Company performance is low $R_l = 0$ with probability equal to 1.
7. At the end of the 1st period the principal receives an information signal s_G regarding the needed strategy. We assumed that $p_G = Prob(s_G = G)$ is probability that the signal identifies the successful strategy.
8. The principal makes a decision related to the strategy choice for the 2nd period. If the Company performance after the 1st period is high R_h, there is no value in

changing the strategy, thus $S_1 = S_0 = G$. However if the Company performance is low $R_l = 0$, the principal considers the signal s_G: s/he observes whether the signal confirms the choice of the strategy. If $s_G = S_0$, the strategy is not to be amended; otherwise $S_1 \in \{s_G, S_0\}$.

9. Afterwards the owner decides whether to leave the CEO or terminate the contract with him and hire a new CEO.
10. In the 2nd period the CEO (old or new) decides whether to exert high or low efforts $e_2 \in \{\underline{e_2}, \overline{e_2}\}$; analogously efforts are non-observable for the owner. Again high efforts of the manager correspond to individual costs c for the manager. The difference between high and low levels of efforts is expressed by the analogous following formula:
$$\triangle e_2 = \overline{e_2} - \underline{e_2}.$$
11. If the applied strategy is successful $S_1 = G$, the Company performance is high R_h with probability e_2 and low R_l with probability $(1 - e_2)$. In case of the unsuccessful strategy $S_1 = B$ the Company performance is low R_l with probability equal to 1.

As it has been already mentioned, the chief executive cares not only for his monetary contract but also for his reputation after the strategy implementation or contract termination. Let us denote the CEO's reputation after period i as q_i, the definition of reputation is probability that the manager is of high type H provided the Company performs well or poorly (R_h or R_l respectively) and whether the Company strategy is amended or not in the 2nd period.

Let us denote the CEO value as $f(q)$ provided s/he has a reputation q; the formula representation is provided below:

$$f(q) = \alpha q, \tag{1}$$

where $\alpha > 0$.

The reputation of the agent keeps updating even if the contract with him/her was terminated after the 1st period. Only reputation of the first, old, CEO who made a strategic decision to implement is considered in the model. A new CEO has no reputational risks as he is not the one who chooses the strategy.

Let us find the value of reputation q with Bayes' formula:

1. If $R_1 = R_h$, also $S_1 = S_0$ and $R_2 = R_h$, then $q = q^h = 1$.
2. If $R_1 = R_l$, $S_1 = S_0$ and $R_2 = R_l$, then
$$q = q_0^{l,l} = \frac{q_0(1-e_1)(1-p_G)(1-e_2)}{q_0\,(1-e_1)\,(1-p_G)\,(1-e_2) + 1 - q_0}. \tag{2}$$
3. If $R_1 = R_l$, $S_1 \neq S_0$ and $R_2 = R_l$, then
$$q = q_1^{l,l} = \frac{q_0(1-e_1)(1-p_G)}{q_0\,(1-e_1)\,(1-p_G) + (1-q_0)(p_G\,(1-e_2) + (1-p_G))}. \tag{3}$$
4. If $R_1 = R_l$, $S_1 \neq S_0$ and $R_2 = R_h$, then $q{=}q_1^{l,h}{=}\,0$.

Interaction between the owner and CEO is represented in the form of a decision tree in Fig. 1. Dotted lines incorporate the same information sets, in other words the player with the move cannot differentiate between nodes within the information

set. Several branches are not depicted in detail due to the fact that the outcome will never occur. Branches where CEO exerts low efforts are analogous to branches where s/he exerts high efforts; the only difference is in probabilities. Also. There are 4 alternatives for the owner: A – not change the strategy nor the CEO; B – not change the strategy, hire a new CEO; C – change the strategy and hire a new CEO; D – change the strategy, leave the old CEO.

Payoffs of each player are described as follows:

1. If the contract with the agent is not terminated, then he receives a sum of payoffs for two periods. If he gets fired, he receives compensation only for the 1st period while the new manager receives compensation for the 2nd period. Let us denote the following:
   w^i is CEO's compensation for the 1st period provided $R_1 = R_i$, where $i \in \{h, l\}$;
   $w^{i,j}$ is CEO's compensation for the 2nd period provided $R_1 = R_i$, $R_2 = R_j$ where $i, j \in \{h, l\}$;
   $w^{i,j}_{new}$ is a new CEO's compensation for the 2nd period provided that a new manager is hired and $R_1 = R_i$, $R_2 = R_j$ where $i, j \in \{h, l\}$.
2. The principal's payoff is equal to a sum of Company performance figures for two periods less compensation of the agent(s).

Solution of the model. Compensation contract is accounted for the solution of the model. Equilibrium strategies for the principal and the agent constitute the overall Nash equilibrium; the model is solved by backward induction.

Let us consider the last move of the game where the top manager makes a decision about the level of efforts. In each sub-game the manager has 2 alternatives: exert high level of efforts $\overline{e_2}$ or shirk and exert low level of efforts $\underline{e_2}$. High efforts mean higher payoff for the principal.

Let us denote conditional probability that executed strategy of the 2nd period is successful (accounted for the Company performance in the 1st period and the fact whether the strategy has been changed or not) as p:

$$p = \begin{bmatrix} 1 \text{ if } R_1 = R_h \text{ or } s_G = S_0, \\ p^0 \text{ if } R_1 = R_l,\ s_G \neq S_0 \text{ and } S_1 = S_0, \\ p^1 \text{ if } R_1 = R_l,\ s_G \neq S_0 \text{ and } S_1 = s_G, \end{bmatrix} \tag{4}$$

where

$$P^0 = \frac{q_0(1-e_1)(1-p_G)}{q_0\,(1-e_1)\,(1-p_G) + 1 - q_0}, \tag{5}$$

$$P^1 = \frac{p_G(1-q_0)}{q_0\,(1-e_1)\,(1-p_G) + 1 - q_0}. \tag{6}$$

In order to find compensation value we are required to solve linear programming problem: the principal maximizes his/her expected payoff for the 2nd period by minimizing the agent's expected compensation. The objective function looks as follows:

$$\min \left[p\left(\overline{e_2}\; w^{i,h} + (1 - \overline{e_2}\;)\, w^{i,l}\right) + (1-p) w^{i,l} \right] .$$

Subject to:

$$w^{i,h} - \; w^{i,l} \geq \frac{c}{p \triangle e_2} - \triangle f,$$

$$p(\overline{e_2}w^{i,h} - \ (1-\overline{e_2})\, w^{i,l} + (1-p)w^{i,l} \geq c,$$

$$w^{i,h} \geq 0, \ w^{i,l} \geq 0.$$

There are four possible outcomes:

1. $R_1 = R_h$. It is not feasible to change the strategy and therefore results are equivalent to the Base game in App. 1:

$$w^{h,h} = \frac{c}{\triangle e_2}, \tag{7}$$

$$w^{h,l} = 0. \tag{8}$$

Compensation is the same for the old and new CEOs.

2. $R_1 = R_l$, $s_G = S_0$, then $p = 1$. Compensation for the old CEO is the following:

$$w^{l,h}_{S_1 = s_G = S_0} = \max\left[\frac{c}{p\triangle e_2} - \triangle f; \frac{c}{\overline{e_2}}\right], \tag{9}$$

$$w^{l,l}_{S_1 = s_G = S_0} = 0. \tag{10}$$

3. $R_1 = R_l$, $s_G \neq S_0$ but $S_1 = S_0$, then $p = p^0$, compensation for the old CEO is:

$$w^{l,h}_{S_1 = s_G = S_0} = \max\left[\frac{c}{p^0\triangle e_2} - \triangle f; \frac{c}{p^0\overline{e_2}}\right], \tag{11}$$

$$w^{l,l}_{S_1 = S_0} = 0. \tag{12}$$

4. $R_1 = R_l$ and the strategy was changed ($S_1 \neq S_0$).

The contract with old CEO is not terminated:

$$w^{l,h}_{S_1 \neq S_0} = \frac{c}{p^1\triangle e_2} - \triangle f, \tag{13}$$

where

$$\triangle f = f\left(q^{i,h}\right) - f\left(q^{i,l}\right), \tag{14}$$

$$w^{l,l}_{S_1 \neq S_0} = 0. \tag{15}$$

The contract with new CEO is the following:

$$w^{l,h}_{S_1 \neq S_0, new} = \frac{c}{p^1\triangle e_2}, \tag{16}$$

$$w^{l,l}_{S_1 \neq S_0, new} = 0. \tag{17}$$

Under these compensation values for the 2nd period the CEO will always exert high level of efforts, as his expected payoff accounted for high efforts is higher than in the case of low efforts.

Now let us consider the principal's move.

1. If after the 1st period the Company performance is high R_h or the performance is low $R_l = 0$ but the signal identifies that the initial strategy should be maintained $s_G = S_0$, the owner has two alternatives: pursue the initial strategy with the old or the new CEO. Base game solution presented in App. 1 demonstrates that hiring a new manager under the initial strategy is not optimal; therefore we assume that in such a case the owner always prefers to leave the old top manager in the Company.
2. If or the performance is low R_l and the signal confirms that the initial strategy will fail $s_G \neq S_0$, the owner has four alternatives:

A – not change the strategy nor the CEO
B – not change the strategy, hire a new CEO (non-optimal)
C – change the strategy and hire a new CEO
D – change the strategy, leave the old CEO (non-optimal)

Base game solution presented in App. 1 demonstrates that option B is not optimal. Let us consider alternatives C and D provided that the strategy is changed, $S_1 \neq S_0$. In this case compensation for the old and new CEOs should be compared (formulas (1.15) and (16) respectively, taking into account $\triangle f < 0$ in formula (14)). Compensation of the old CEO is higher than for the new CEO; that is why when a new strategy is adopted, the owner prefers hiring a new chief executive. Alternative D is therefore non-optimal, so the owner chooses between options A and C.

Under the condition that expected payoff of the owner in case of the initial strategy execution is higher than in case of a new strategy implementation in the 2nd period, he decides to follow the initial strategy (and leave the old CEO).

Let us consider the first move of the manager. He has 2 options in 2 sub-games: exert high or low level of efforts. In order to find optimal compensation incentivizing to exert high efforts, the following linear programming problem should be solved:

$$\min \left[q_0 \left(\overline{e_1}\ w^h + (1 - \overline{e_1}\ )\, w^l \right) + (1 - q_0) w^l \right].$$

Subject to:

$$w^h - w^l \geq \frac{c}{q_0 \triangle e_1} - \overline{e_2} \left(w^{h,h} - w^{l,h}_{S_1 = S_0} \right) - (1 - \overline{e_2}) \triangle f,$$

$$w^h \geq 0,$$

$$w^l \geq 0.$$

The problem solution is the following:

$$w^h = \max \left[0;\ \frac{c}{q_0 \triangle e_1} - \overline{e_2} \left(w^{h,h} - \mathrm{w}^{l,h}_{S_1 = S_0} \right) - (1 - \overline{e_2}) \triangle f \right], \tag{18}$$

$$w^l = 0. \tag{19}$$

Considering these results it is transparent that the manager will exert high efforts in every sub-game in the 1st period in order to maximize his expected compensation. Therefore Nash equilibrium strategies for both players are as follows:

1. For the manager: in both periods he should exert high efforts $\overline{e_1}$ and $\overline{e_2}$.

2. For the owner: accounted for

$$P^0 \geq P^1 - \frac{P^1 \mathrm{w}^{l,h}_{S_1 \neq S_{0,new}} - P^0 \mathrm{w}^{l,h}_{S_1 = S_0}}{R_2}. \tag{20}$$

He should not change the strategy or the manager. Otherwise, he should change the strategy and hire a new manager.

Let us calculate expected payoff for the owner for both periods:

1. If $S_1 = S_0$:

$$q_0 \left(\overline{e_1}\left(R - w^h + \overline{e_2}(R - w^{h,h})\right) + \right.$$
$$\left. + (1 - \overline{e_1})\left(p_G \overline{e_2}(R - w^{l,h}_{S_1 = s_G = S_0} + (1 - p_G)\overline{e_2}(R - w^{l,h}_{S_1 = S_0})\right)\right). \tag{21}$$

2. If $S_1 \neq S_0$:

$$q_0 \left(\overline{e_1}\left(R - w^h + \overline{e_2}\left(R - w^{h,h}\right) + (1 - \overline{e_1})\, p_G \overline{e_2}\left(R - \mathrm{w}^{l,h}_{S_1 = s_G = S_0}\right)\right)\right) +$$
$$+ (1 - q_0) p_G \overline{e_2}(R - \mathrm{w}^{l,h}_{S_1 \neq S_0, new}). \tag{22}$$

The game solution is demonstrated in Fig.2.

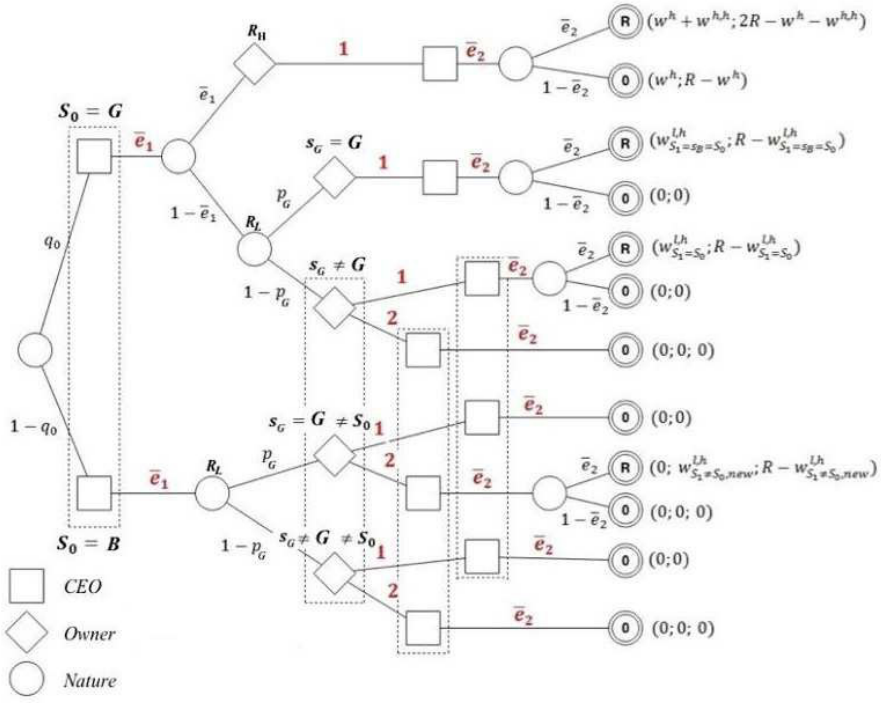

Fig. 2: Game solution

4. Specification of parameters for U.S. public companies

In order to make corresponding computations using the model, we needed to obtain data for corresponding variables or develop methods to approximate some of the variables.

Principal role. A very important issue is who to consider the principal while illustrating the model. In theoretical model we assumed that the principal can intervene and make a decision in regard to a strategy and CEO choice. In reality shareholders certainly have rights to monitor and oversee the CEO activities but with big limitations. Once there is a majority shareholder[1] in the company, i.e. investor that owns more than 50% of the company's outstanding shares, we can assess the probability of his/her intervention, dependent on individual behavior patterns (e.g. prior active participation in the company strategic decisions). Due to high control and voting interests in the company the majority shareholder is rather influential in business operations and strategic directions. However, as it has been mentioned U.S. public companies usually have scattered ownership and are, therefore, scarce for majority shareholders.

Due to the above mentioned reasons operational monitoring is delegated to the board of directors, so we approximate the role of the principal by the board of directors that is believed to execute actions in the shareholders' interest. We also can observe whether Chairman is independent director and how long he has been a part of the board, testing the assumption that independent directors are objective in pursuing shareholders' interest and are not captured by the CEO[2]. The underlying assumption based on literature review is that the longer chairman stays in his position, the more entrenched and the more dependent on CEO he becomes.

In either case we will consider ownership structure of the company under analysis.

Agent role. We have also underlined that the agent is a party who is delegated management of the principal's assets in order to maximize the principal's utility, i.e. maximize shareholders' value[3]. Therefore, it is natural that the CEO is assumed to be the agent in the model.

Strategy. Another essential aspect is definition of strategy in general, as well as strategy types. Strategy is strategy is the means by which individuals or organizations achieve their objectives (Grant, 2010). The strategy is focused on achieving certain goals (under resource constraint) that can be attained by pursuing critical actions that are consistent are cohesive with the decisions.

For our model it is essential to differentiate between successful and non-successful strategies. A successful strategy aims at achieving maximum economic results. However, high economic results are dependent not only on strategy choice but also on external factors (macro-environment, industry specifics) and different internal factors (including but not limited by efforts during the implementation). In reality, we understand that consistent long-term (over 3-5 years) above-industry average performance is results of a successful strategy implementation. Once again we will

[1] The majority shareholder is often the founder of the company, or in the case of long-established businesses, the founder's descendants.

[2] Gutierrez-Urtiaga M. (2000) Managers and Directors: a Model of Strategic Information Transmission. Working Papers from Centro de Estudios Monetarios Y Financieros; Cyert, Kang, Kumar (2002); Core, Holthausen, Larcker (1999)

[3] And/or if needed for utility maximization, optimize other Company parameters

stress that the working model focuses on incentivizing the manager at the phase of strategy execution.

There are different ways to categorize strategies described in strategic management academic resources. In a public company strategies can be divided into four layers (corresponding responsible managers are specified in the parentheses): corporate (CEO), division/ business (division president or executive vice president (VP)), functional (finance, marketing, manufacturing, R&D, HR, etc. manager) and operational (department, plant, etc. manager). Certainly, lower-level strategies should be in line with upper-level strategies. As follows from the paper name, we are focusing on corporate strategies in public companies.

The corporate strategy considers the following main elements: vertical scope (value chain), geographical scope, and product scope (Grant, 2010). A more thorough typology of strategies includes the following types: intensive in terms of product scope (market penetration, market development, product development), integration in terms of vertical and geographical scope (forward, backward, horizontal), diversification (concentric, conglomerate, horizontal), divestiture, retrenchment, liquidation, and a combination strategy.

According to Michael Porter (1980), there are two generic business strategy types – cost leadership and differentiation, which can lead to a competitive advantage defending against market forces of the industry. Whereas cost leadership means offering of standardized products, commodity, at low average unit cost, usually targeted at price-sensitive audience, product differentiation implies unique product offering desired by relatively price-insensitive customers. Cost leadership is aimed at wide range of customers while the product is distributed at the lowest price at the market. It usually highly correlates with high barriers of entry as the mentioned strategy requires economy of scale and, therefore, (prohibitively) high capital investment. Differentiation can incorporate several of the below mentioned dimensions: different design, brand image, number of features or different production technology. Additionally, the company can focus on a niche market achieving either a low cost advantage or differentiation in a narrow market segment.

Strategies can also be classified according to degree of activity: aggressive, defending and regressive.

Successful strategy is the result of simple, consistent, long-term goals; solid understanding of the competitive environment; objective appraisal of resources and effective execution efforts (Grant, 2010). The chosen model helps to incentivize the CEO to implement the strategy effectively.

Financial performance. In a general case while assessing the company performance shareholders usually care for the following aspects:

1. Their earnings (current and future)
2. Risk of their investment

In order to measure these parameters, we can assess the company performance – either financial or non-financial performance. However, we assume that non-financial metrics of company performance can be approximated by the financial ones[4]; therefore, let us consider types of financial performance metrics. Financial performance

[4]Even though company objectives can be expressed in non-monetary metrics too

indicators can be grouped into four categories. This classification is based on conventional financial analysis and corporate finance methods.[5]

Targets can be set for any of these metrics, hereby at the end of the periods in the model performance will be measured against these targets. Usually operational profitability performance metrics are set as targets for non-incentive equity plan (e.g. Operational profit, sales). As for performance-based stock awards, market ratios are usually taken into account while setting performance targets for this component (e.g. EPS).

In a specific situation, however, performance indicators are identified on the base of the strategy. Realized target values are the outcome of successfully implemented strategy.

Since financial targets chosen for specific cases usually combine several metrics, in case analysis we calculate multiples based on weights and values of metrics chosen by the Company to evaluate financial performance. Then we normalize performance indicator against the target figure.[6]

Table 1: Financial performance measures. Source: own rendering

Financial performance	
Group	*Most common variables*
Profitability incl. Investor ratios Market ratios	EBIT / Operating Profit, NI, revenue, costs ROI, ROE, ROIC EPS, P/E, P/B
Shareholder value	Intrinsic value, market cap, cash flows
Operations management	solvency, liquidity, business activity (efficiency) ratios
Gearing ratios	D/E, financial leverage

International aspect. The U.S. public companies chosen for the case study analysis should be involved in international commercial transactions that occur between two or more regions in order to be qualified as international (transnational or global) companies, i.e. sales, investments, logistics, etc. Since our research covers the largest U.S. public companies most of them have international operations, international suppliers or other logistics partners or hold international investments in their portfolio. We specify the international aspect of each company in the Company profile.

Compensation. In order to denote an unknown variable that corresponds to compensation package in the model, there are two approaches to measure compensation:

[5]Choi F., Frost C., Meek G. (2002) International Accounting. 4th Int.ed. Prentice Hall/Pearson Education Int.; Brigham E., Ehrhardt M. (2010) Financial Management: Theory & Practice. 13th ed. Thomson-South Western; Ross S, Westerfield R., Jordan B. (2008) Essentials of Corporate Finance. 6-th ed. McGraw Hill

[6]Therefore, as financial result figures we have 0 or R calculated for the specific Company

1. *Non-equity incentive plan* that is considered due to two reasons: it is a performance-based compensation component (can be short- and long-term); targets are usually rigorously described in the annual proxy statements.

2. *Performance-based stock units and Non-equity incentive plan* can be considered an integral incentive package. Targets for stocks awards component are also described in the annual proxy statements.

Other performance-based compensation components (stock options and time-based restricted stock units) are not considered in the scope of current research due to the following reason: these instruments are usually offered by the Company to retain the CEO in the Company for a particular time. Granting common shares (so that shares are realized[7], i.e they can be sold or be subject to any other transactions) usually has a downside risk since the owner of shares can also experience losses if the Company stocks are plummeting.

We use formulas (7) – (13), (14), (18) – (19) to calculate compensation values for the old CEO at the end of the 1st or 2nd period (accounted for the Company results and information signal regarding the applied strategy). Formulas (16) – (17) are used to calculate compensation of the new CEO if the decision was made to replace the old CEO after the 1st period.

Other variables used in the analysis. A full list of variables used in the model can be found in Tab. 3

Table 2: Additional model variables. Source: own rendering

Variable	**Brief description**	**Calculation method**
q	CEO reputation	See supplementary computation method of initial reputation q^0; Formulas (2) and (3)
f	CEO value	Formula (1)
$\triangle f$	Change in CEO value	Formula (14)
c	Cost of exerting high efforts	Planned bonus for the period; if no bonuses were paid out, mean bonus for the industry
e	Efforts exerted by CEO	See supplementary computation method below
p	Conditional probability of implementation of successful strategy in the 2nd period	Formulas (4) - (6)
p_G	Probability of identification of the successful strategy via signaling	See supplementary computation method below
Condition for changing the strategy		Formula (20)

Further clarifications should be made regarding evaluation of probabilities in the model.

Reputation of CEO. There are 3 methods of the reputation variable construction.

[7]Refer to Center on Executive Compensation (realized vs. realizable pay): http://www.execcomp.org/Issues/Issue/pay-for-performance/realized-pay

1. We assess *the whole prior history* of the CEO. Additional variables that need to be calculated are the following:
   - total number of years when the person in question was performing successfully as a CEO in *all previous companies;*
   - total number of years when the person in question was serving as CEO in *all previous companies.*

   Quotient of these two variables is the required probability.
2. We assess only *last CEO tenure* prior to the current position. We additionally calculate analogous variables:
   - number of years when the person in question was performing successfully as a CEO in *the previous company;*
   - number of years when the person in question was serving as CEO in *the previous company.*

   Quotient of these two variables is the required probability.
3. Rating of the CEO in the press, assessed by the industry experts (CEO rating divided by the maximum possible rating).

However, there are possible limitations to these calculation methods.

In case study analysis we considered for this research paper for most CEOs some of the prior positions did not include CEO position but executive position. Then we adjust calculations and calculate probabilities based on experience at other executive positions (trying to correspond executive's positions to appropriate performance metrics to assess his/her success).

There are also cases when prior work places were private companies or subsidiaries with non-disclosed performance figures. Then we adjust our calculations and use Method 2.

In case of prior history within the Company (we assess implementation of a new strategy but the CEO was serving in the Company as chief executive) we assess the period prior to evaluation as it was a case of a separate company in regard to the number of successful and total years.

Efforts of CEO. There are 2 methods to evaluate efforts level in the model.

1. Similar to the CEO reputation, this variable is based on historic behavioral patterns of the CEO. We assume that in order for the company to perform above industry average extra efforts from the CEO's side should be applied. We, therefore, find information on the following variables:
   - number of years when the company was performing above the industry average during the CEO tenure, by company;
   - number of years when the person was serving as CEO in the company, by company.

   We calculate corresponding quotients by company and choose the highest probability of high efforts and the lowest probability of low efforts.
2. Due to the fact that high efforts cause additional costs for CEO and we proxy these costs as Bonus assuming that additional efforts are reimbursed to the CEO in the amount of bonus, we can assess bonus history of the CEO in all prior companies. Quotient of number of years with bonuses over number of years s/he was performing as CEO but didn't receive any additional rewards for efforts, by company, will correspond to the required probabilities. Again, we choose the highest probability to represent high efforts and the lowest probability for low efforts.

There are also certain limitations to calculations. For some case study we can obtain information only on the prior work place. Then we consider different performance metrics and compare them against the industry average. Then analogous to the above mentioned method, we calculate corresponding quotients by performance metric; the highest probability represents high efforts and the lowest probability reflects low efforts.

Analogously, In case of prior history within the Company (we assess implementation of a new strategy but the CEO was serving in the Company as chief executive) we assess the period prior to evaluation as it was a case of a separate company in regard to the number of successful and total years.

Probability of successful strategy identification by the principal. This variable is computed based on analysis of the board of directors. The share of independent directors in the board should be used as approximation of successful strategy determination. Current academic studies such as Gutierrez-Urtiaga (2000), Cyert, Kang, Kumar (2002) and Core, Holthausen, Larcker (1999) suggest that independence of directors increases the quality of their responsibilities fulfillment. Since their duties include strategic monitoring and efficient CEO compensation programs, we assume that this quotient reflects probability of successful strategy identification.

5. Industries

In order to analyze the applicability of the considered theoretical approach it was necessary to narrow the research area to concentrate on several industries. Industry should have been representative that means companies should differentiate by size. That is, outcomes for the considered industries can be probably extrapolated on other industries. Realistically the industry incorporates not only public but also private companies, which compete along. However, lack of data regarding private companies' performance measures and compensation packages are not available for the public, so we considered only public companies. Moreover, conflicts in corporate governance in private companies are not as acute since the ownership is more concentrated. Another requirement for the examined industries is low volatility in examined year, so we chose the period between 2011 and 2013.

All public companies in the U.S. could be divided into 14 different key industries. For the purpose of our research, retail and IT-industry were chosen. The choice of sectors is interesting due to the following reason: retail is a relatively mature sector whereas information is rapidly growing sector. Therefore, such elements as demand, competition and product itself would differ; therefore, key success factors and strategies adopted in these industries would also be different. IT-industry is particularly interesting because key success factors here are brand development, fast product development and realization on the market, innovations, but mature industries can benefit from cost and scale efficiency, and low input costs. However, we considered top performing U.S. sectors, therefore, large players in mature industries also try to innovate and disrupt the course of conventional business operations

Overall, in the first research there were 16 companies from retail and technology industry, in the second research there were 80 companies from retail and 82 companies from IT-industry in our research. The data on such parameters as base salary, cash bonuses, stock awards, stock options, Non-equity incentive plan, other compensation, total compensation, market capitalization, CEO age and working

experience in years was gathered. It was done in order to access industry average parameters included in the research, find companies for case studies and show in descriptive statistics that variable part of compensation package of CEO is very significant for those industries. So, for retail industry a variable part is 74,8% of total compensation of CEO in 2011-2013, and for IT-industry – 88,2%.

6. CEO incentive plan case studies analysis

Penney Company incentive plan practice

Company profile. J. C. Penney Company Inc. (JCP), incorporated on January 22, 2002, whose main operating subsidiary is J. C. Penney Corporation, Inc.[8] JCP encompasses selling merchandise and rendering services to consumers through department stores and online channel (jcp.com). The Company operates in the USA and internationally (1,104 department stores throughout in the USA and Puerto Rico).[9] Product offering includes: family clothes and footwear, accessories, jewelry, beauty products (Sephora) and home furnishings. Service offering consists of the following: styling, optical, photography and other services.

Ownership structure. Ownership structure can be found in the annual report and proxy statements. The majority of shares are owned by institutional stockholders (75.91% in monetary value) who are usually more long-term oriented than individual investors. 23.63% of total equity belongs to mutual funds and only 0.46% to insiders. According to Morningstar, the 20 largest owners (institutions and mutual funds) possess 58% of total shares.[10] Even though the figure is rather high, concentration of ownership is still rather low. Due to scattered ownership in the U.S. public companies we will use the Board of directors and its characteristics and guidelines for the model as a proxy of the principal.

Shareholders meetings (meetings of all stockholders) that happen annually mostly deals with matters regarding election of directors, approval of compensation plans, regulations and adopted-to-be documents that improve Company policies for tax benefits. Theoretically speaking, the Meeting can consider any other business properly brought before the meeting. However, it is certainly rather complex to be actively engaged in strategic planning of the Company. At each meeting of stockholders, the holders of a majority should constitute a quorum for the transaction of business. In the absence of a quorum the meeting may be adjourned until a quorum is present.[11]

The JCP Corporate Guidelines require stock ownership quota for the CEO: the goal in 2013 is 5x-6x of annual base salary within 5 years after being appointed (beforehand the goal was 10x of annual base salary).

Board of directors. Issues regarding corporate governance in the company are reflected in Corporate Governance guidelines where objectives and responsibilities of the stakeholders.

[8] Refer to Reuters: http://www.reuters.com/finance/stocks/companyProfile?symbol=JCP

[9] As of February 2, 2013

[10] Refer to Morningstar:http://investors.morningstar.com/ownership/shareholders-overview.html?t=XNYS:JCP&region=usa&culture=en-US

[11] Refer to JCP Bylaws

One of the most important elements of corporate governance and interaction with CEO in particular is the board of directors. The size of the board should not be less than 3 directors; size of 10-15 directors is considered appropriate in the current Guidelines. The Board meets at least 6 times per annum unless called upon more frequently by the Chair.[12]

The Chairman of the Board may also serve as the JCP CEO, which underlines the source of possible asymmetry of information. However, the Board is comprised of a majority of independent directors (according to NYSE criteria for independence)

According to the Guidelines, business matters are managed under the supervision of the Board, which represents and is accountable to JCP stockholders. Among the Board's responsibilities, among others, are overseeing and regular evaluation of *strategy of JCP*, *the management effectiveness of strategy implementation* and *the selection, evaluation and setting of appropriate compensation for JCP CEO.*

There are five corresponding committees that treat corresponding issues and therefore execute delegated responsibilities: Audit, Corporate Governance, Finance and Planning, Human Resources and Compensation, and the Committee of the Whole.[13]

The independent directors committee, so-called Committee of the Whole, meets annually to assess the CEO's performance based on goals and objectives previously set out by the Committee of the Whole. The evaluation is usually conducted on the base on objective criteria (e.g. performance of the business, accomplishment of long-term strategic objectives, etc.*)* and used by the Committee of the Whole to construct CEO's compensation package (along with data and information regarding CEO compensation matters and a non-binding recommendation received from the Human Resources and Compensation Committee).[14]

In 2012 the Board consisted of 12 directors, thereof 11 were independent. Thomas J. Engibous was a non-employee, independent director. These figures are used for probability of successful strategy identification ($p_G = 0.92$). Hereby we believe that probability that the highly independent Board with independent Chair can determine the best possible decisions for the Company.

Problem description. Mr. Johnson was hired to lead rebranding of JCP to shake up the store's stodgy image and attract new customers by introducing upper class product portfolio of higher pricing and rejected a former policy of discounts on markup prices. While his rebranding effort was ambitious, he was said to have "had no idea about allocating and conserving resources and core customers. He didn't do test the concept on a sample market and his strategy failed.

New strategy in 2012: changes in pricing strategy, corporate branding, marketing, store layout and merchandise assortments, namely substantial changes in merchandise, edition and introduction of more global brands into the merchandise assortment, re-organization of department stores into curated unique specialty stores.[15]

[12]Refer to Corporate Governance Guidelines:
http://ir.jcpenney.com/phoenix.zhtml?c=70528&p=irol-govguidelines
[13]Refer to Investors relations web page:
http://ir.jcpenney.com/phoenix.zhtml?c=70528&p=irol-govcommcomp
[14]Refer to the Committee of the Whole Charter
[15]Refer to 10-K annual report

CEO profile: Ronald Ron B. Johnson, 54 yrs[16] (tenure: Nov. 2011 – 2013). Mr. Johnson has over 20 years of experience in retail and merchandising and impressive growth achievements in billion-dollar companies such as Apple and Target.

Career timeline:[17]

Nov, 2011 – Apr, 2013 – CEO at J.C. Penney Company, Inc.

2000 – 2011 - Senior Vice President, Retail for Apple, Inc. (Apple's retail strategy)

1985 – 2000 – Senior Vice President of Merchandising of Target Corporation and other senior management positions (initiatives for branding, marketing and merchandising)

Mr. Johnson's history of performance in the companies is provided in App. 7. Based on App. 7 reputation and probabilities of exerting high and low efforts are constructed for the model testing.

Current incentive plans. Due to prior long history of unsuccessful results and current transformation strategy CEO compensation structure in JCP is designed to tie compensation and performance. The target compensation mix of 2013 reflects the desired pay composition, including 29.8% of total pay in cash incentive awards and 26.6% in performance-based restricted stock units (PBRSUs), resulting in 56.4% of total pay in performance-based awards (against targets) and 78.4% in performance-based compensation (including stock options). History of actual compensation in Tab. 3 demonstrates that after rich initial payment in the form of stock awards to the new CEO in 2011, all incentive payments were equal to 0 (short-term and long-term incentives) due to outrageous bad performance of JCP and failure of implementation of the diversification strategy.

Table 3: CEO compensation at JCP. Source: rendering from DEF 14A proxy statements

Compensation, ths USD	**2011**	**2012**	**2013**
Salary	1 864,583	1 500	810,606
Bonus	0	0	0
Stock awards	64 056,935	0	0
Option awards	3 600	0	0
Non-equity incentive plan	2 111,302	0	0
All other compensation	16 210	388,587	1 582,024
Total compensation	87 842,827	1 888,587	2 392,630

Annual cash incentive awards. Cash incentives are paid out in accordance to annual Management Incentive Compensation Program. The incentive plan in 2012 was based only on Operating profit as an indicator of earnings and cost savings attainment whereas for the year 2013 performance metrics were broadened, then sales objectives were also included in the program for the CEO stimulation. In 2013 weights for performance metrics were 50% and 50% for operating profit and sales

[16] At the time when he started serving as CEO

[17] Refer to Bloomberg Businessweek:
http://investing.businessweek.com/research/stocks/people/person.asp?personId=652443&ticker=AAPL

respectively. Once the target had been achieved, the CEO would have been paid out as a percentage from the base salary.[18]

Long-Term Incentive Awards. Long-term incentive awards are paid out corresponding to long-term incentive plan (3 years). In 2012 there were no PBRSUs offered to the CEO. Equity-based incentives in 2013 were offered to the CEO once he achieves Earnings/loss per share (EPS) target. The number of units granted was considered as a target award and this figure could be adjusted dependent on the actual EPS value.

Targets during the CEO tenure are also presented below in Tab. 4 along with actual figures. Target and actual figures are used to normalize JCP performance figure in order to obtain compatibility of numbers.

Table 4: Target and actual performance at JCP.Source: rendering from DEF 14A proxy statements and 10-K annual reports

For incentive plans	**2012**		Weights	**2013**		Weights
	T	**A**		**T**	**A**	
Operating profit target, bln USD	1,099	-1,016	100%	-0,106	-1,244	50%
Sales, bln USD	N/A	N/A		12,872	11,859	50%
EPS, USD per share	N/A	N/A		-1,22	-4,64	

Model illustration and reality check. The case is broken down into two periods: first period is year 2012 and the second is year 2013. Based on the methodology presented in section 4, we constructed variables in order to assess incentive compensation package as well as evaluate probability to change the company strategy and current CEO.

In order to calculate initial reputation of the CEO we used data from App. 7. Since Ron Johnson was previously working in Apple, we obtained data on operating profits and net sales of Apple during the years. For successful years we considered years of the company growth (8 successful years against 12 years overall). Therefore, the initial reputation $q_0 = 0.67$ according to Method 2 of reputation calculation and 0.75 based on Method 3 (Businessweek and Forbes expert qualitative valuation was put into scale).

Efforts were analyzed against industry average results for growth rates and operating margins. High efforts probability is, therefore, $\overline{e_1} = 0.92$ (11 successful years against 12 total years) and $\underline{e_1} = 0.42$ (5 successful years against 12 total years).

For the second period history for Mike Ullman was analyzed due to his replacement of Ron Johnson and effort figures were applied for him ($\overline{e_2} = 0.75$ and $\underline{e_2} = 0.3$).

Due to the fact that bonuses were not paid out in the Company for a number of years, we took an average bonus value for the retail industry ($c = 150$).

Using corresponding formulas (1) – (6) and (14) for amended reputations, conditional probabilities and value of the CEO we construct additional variables that can be found in Tab. 5. Then using formulas (7) – (13), (14), (18) – (19) and (16) – (17) we calculate all possible compensation values for the case (our model in Excel

[18] We point out again that independent directors set out targets and incentive opportunities(a corresponding multiple that translates objective into incentive) for the CEO, according to JCP Corporate Governance Guidelines

is constructed for the general case, therefore, it calculates all values), applicable for this case formulas are (15) and (17).

Overall model results are presented in Tab. 5 According to the model JCP Board of directors should have let go the CEO and immediately changed the strategy to improve the company financial performance. Along with an amended strategy, the Board should have also hired a new CEO who will be executing a new recovery strategy. Incentive package for current CEO should be 0 (compensation to a new CEO should also be 0).

Actual life was escalating similarly to what the model has predicted: the contract with the current CEO Ron Johnson was terminated and his successor (and predecessor Mike Ullman) came back as a CEO to get the company back on the feet. However, already for the past 7 years the company was stagnating (Operating profit) and until now the profitability situation hasn't improved. So Mr. Ullman hasn't obtained any incentive compensation yet since he returned back to his position.

Table 5: Model results for JCP case. Source: own rendering

q_0	$\overline{e_1}$	$\underline{e_1}$	$\overline{e_2}$	$\underline{e_2}$	p_G	c	R
0,67	0,92	0,67	0,75	0,29	0,92	150	1000

$\triangle e_1$	$\triangle e_2$	p^0	p^1	$q_0^{l,l}$	$f(q_0^{l,l})$	$q_1^{l,l}$	$f(q_1^{l,l})$
0,25	0,46	0,014	0,904	0,00346	0,104	0,043	1,28

$w^{h,h}$	$w^{l,h}_{S_1=S_0}$	$w^{l,h}_{S_1\neq S_0,new}$	$w^{h}_{S_1=S_0}$	$w^{l,h}_{S_1=s_G=S_0}$	$\triangle f$	Change?
323,077	23554,7	357,343	18316,3	293,181	29,896	Yes

Applied procedure for the theoretical model was tested on 10 case studies: 5 for companies of retail industry and 5 companies of IT-industry.

Target Corporation

Company profile. Target Corporation (TGT), incorporated on February 11, 1902, is engaged with selling general merchandise and food in stores (CityTarget and SuperTarget). TGT operates in three business segments based on product and geographical scope: U.S. Retail, U.S. Credit Card and Canadian (costs incurred in the U.S. and Canada related to its Canadian retail market). Product offering includes: everyday essentials and fashionable, differentiated merchandise at discounted prices.[19]

Ownership structure. Currently 70.8% of total equity (in monetary value) belong to institutional investors, 29.1% to mutual funds and only 0.1% to insiders. The largest 20 institutional and mutual fund investors hold 62.48%.[20] Even though the value is rather high, concentration of ownership is still considered low. Due to scattered ownership, the Board of directors again is used as a proxy for the principal's role.

[19]Refer to Reuters: http://www.reuters.com/finance/stocks/companyProfile?symbol=TGT

[20]Refer to Morningstar:http://investors.morningstar.com/ownership/shareholders-overview.html?t=TGT&region=usa&culture=en-US

The Board of directors. The appropriate size for a Board of Directors from Target perspective is 5 to 21 members. The Board believes that a membership of 11 directors is appropriate (however, it can vary in accordance with regular review).[21]

According to Governance Guidelines, the Compensation Committee of the Board of Directors annually evaluates CEO performance and its relationship to reward and provides recommendations. After that the independent members of the Board annually review the recommendations of the Compensation Committee and approve the CEO performance review along with compensation value and composition. The Compensation Committee also produces a report for inclusion in the Corporation's proxy statement in accordance with SEC rules and regulations.

The Board in year 2011 encompassed 11 members, 10 of which were independent.[22] These numbers will be used for calculation of probability of successful strategy identification once the model is tested in this case. Moreover, the CEO was also the Chairman of the Board.

Problem description. Mr. Steinhafel had to adjust to a more modest after-crisis shopper in the wake of the recession, Target's offerings had become more commonplace — heavy on food and other consumer staples. Fewer new products, especially creative unique to Target, were introduced. The product portfolio deteriorated; Target had to add pressure due to tough situation. Risk taking behavior also changed: Target became more risk cautious to new items. Rather than bet on the newest, most unique products, Target increasingly relied on a placement system that awarded prime shelf space to the highest bidders.[23]

CEO profile: Gregg W. Steinhafel, 52 yrs[24] (tenure: 2008 – 2014; 6 years). Mr Steinhafel was a genuine internally made CEO: he went through various job roles before he achieved top executive positions.

Career timeline[25]

2008 – CEO at Target

1999 – 2008 – President at Target

1994 – 1999 - Executive Vice President Merchandising at Target

1979 – 1994 – merchandise trainee at Target; variety of merchandising and operational management positions

Current incentive plan practice. After years of stagnating performance Target adjusted its compensation structure to be tightly linked to performance. According to proxy statements, performance-based compensation that is calculated against target performance measures (including performance-based restricted stock units (PBRSUs), performance share units (PSUs) and short-term incentive plan (STIP)) accounted for 57% in 2011 whereas in 2013 it amounts to 87% of total compensation.[26] Interestingly whereas the Company was using options awards as

[21] Refer to Board Committee web page: http://investors.target.com/phoenix.zhtml?c=65828&p=irol-govcommittees

[22] Refer to DEF 14A Proxy statement (2012) retrieved from the U.S. SEC EDGAR database

[23] Hajewski D. (2008). Journal Sentinel (Bloomberg reporter). Steinhafel To Take Over at Target. Retrieved from: http://www.jsonline.com/business/29548034.html

[24] At the time when he started serving as CEO

[25] Refer to Bloomberg Businessweek: http://investing.businessweek.com/research/stocks/people/person.asp?personId=174446&ticker=TGT; Refer to App. 7 to find data on parameters evaluation

[26] Refer to proxy statements retrieved from U.S. SEC EDGAR database

remuneration element, it completely abandoned this component in 2013. Summary of compensation values and composition is presented in Tab. 6.

Table 6: CEO compensation at TGT. Source: rendering from DEF 14A proxy statements

Compensation, ths USD	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Salary	1345,769	1350	1500	1500	1500	1500
Bonus	447,68	0	1200	1250	0	0
Stock awards	6750,041	4425,064	8017,549	4857,502	5285,245	10224,12
Option awards	4074,038	3503,393	3189,299	3696,982	5248,573	0
Non-equity Incentive Plan	0	3250	4101	2205	2880	0
All other compensation	1020,642	778,177	5982,035	6197,623	5733,646	1229,094
Total compensation	13638,17	13306,63	23989,88	19707,11	20647,46	12953,21

Short-Term Incentives. STIP allows the CEO cash awards based on the following financial metrics, Earnings Before Interest and Taxes (EBIT) and Economic Value Added (EVA). These performance measures reflect objectives for profitability and investment discipline. The weights for these financial metrics are 50% and 50% respectively.

Long-Term Incentives. Long-term incentive plan is comprised of PSUs and PBRSUs. PSUs have a three-year performance period; they are granted in stock based on change in market share (calculated through net sales), EPS growth and return on invested capital (ROIC[27]) in equal proportions. PBRSUs are linked to total shareholders' return (TSR) in comparison to peers. Once the total magnitude of long-term performance-based compensation is identified, 75% of this value is granted in the form of PSUs and 25% in PBRSUs.[28]

Due to the fact that performance metrics are measured in rankings, we will need corresponding scale to interpret ranking results and then we will have to normalize he scale against the target value. Therefore, we would have to adjust measures twice, which is too much of value distortion. So we decided to test the model for short-term incentive plan only.

Table 7: Target and actual performance at TGT.Source: rendering from DEF 14A proxy statements and 10-K annual reports

For incentive plans	**2011**		**2013**		Weights
	T	**A**	**T**	**A**	
Operating profit target, bln USD	5,416	5,421	5,459	5,186	50%
EVA, bln USD	0,949	0,936	0,712	0,676	50%

Model illustration and reality check. We divided the real case in two periods: the first period of 2008-2011 and the second of 2012-2013. Analogously to

[27]New metric introduces in 2013; calculated as three year average net operating profit after-tax (NOPAT) divided by average invested capital

[28]Before 2013 the mix was the following: 50% stock options, 25% PSUs, and 25% RSUs.

JCP case we constructed all variables and calculated payoffs of the players based on methodology 1.5 and App. 7 figures.

According to the model the Board should have paid 2.05 mln USD to Target CEO in the first period and 0 in the second period due to overperformance in the first period and underperformance in the second period. The modeled results state that the strategy and the CEO shouldn't be changed.

In the actual situation Mr. Steinhafel also stayed in the company, so there was no change in the company strategy and CEO. Moreover, TGT CEO received non-equity incentive compensation during the first period (2.2 mln USD) and also obtained performance-based RSUs for the next three years as a long-term incentive plan. As performance was plateauing during the 2nd period, he didn't receive any non-equity incentive compensation in 2013.

Table 8: TGT case – model results. Source: own rendering

q_0	$\overline{e_1}$	$\underline{e_1}$	$\overline{e_2}$	$\underline{e_2}$	p_G	c	R
0,83	0,8	0,4	0,76	0,45	0,91667	1.25	1331

$\triangle e_1$	$\triangle e_2$	p^0	p^1	$q_0^{l,l}$	$f(q_0^{l,l})$	$q_1^{l,l}$	$f(q_1^{l,l})$
0,4	0,31	0,07692	0,84615	0,01961	0,58824	0,21552	6,46552

$w^{h,h}$	$w^{l,h}_{S_1=S_0}$	$w^{l,h}_{S_1\neq S_0,new}$	$w^{h}_{S_1=S_0}$	$w^{l,h}_{S_1=s_G=S_0}$	$\triangle f$	Change?
2.032	3.238	2.765	2.05	2	29,4118	No

CEO incentive plan in EMC Corporation

Company profile. EMC Corporation (EMC), incorporated on August 23, 1979, develops, de livers and supports the information and virtual infrastructure technologies, solutions and services, including IT as a service (ITaaS). EMC operates three segments as federated businesses: EMC Information Infrastructure (provider of information storage, intelligence and security solutions), Pivotal (vendor of application and data infrastructure software) and VMware Virtual Infrastructure (provider of virtualization infrastructure solutions).[29]

Ownership structure. Currently 69.25% of equity is owned by institutional 29% by mutual funds and 0.46% by insiders (based on monetary value of equity). Due to the fact that ownership is so scattered: the largest 20 shareholders (institutional; and mutual funds) own only 33.12% of total shares[30], according to Morningstar, it is impossible to consider any of the shareholders as the principal in the model. Therefore, we approximate the principal's role by the Board of directors.

In order to align the CEO's interests with shareholders' expectations, the CEO is required to own 650,000 shares of the Company's common shares.

Board of directors. The main responsibility of the EMC Board of Directors according to Corporate Governance Guidelines is to foster the long-term success of the Company and to build long-term value for the Company's shareholders, consis-

[29]Refer to Reuters: http://www.reuters.com/finance/stocks/companyProfile?symbol=EMC

[30]Refer to Morningstar:http://investors.morningstar.com/ownership/shareholders-overview.html?t=EMC&region=usa&culture=en-US

tent with the Board's fiduciary duties[31]. Therefore, the Board is also responsible for evaluation of the corporate strategy, challenges, industry situation and the Company performance. The Board also identifies potential candidates, selects and monitors performance of the CEO. The Company's strategy is presented by the CEO to the Board and evaluated and discussed on the regular basis.

The Board consists of no fewer than 8 nor more than 11 directors (it annually reviews the size of the Board). A majority of the Board should qualify as independent directors under the NYSE listing standards.[32]

Currently there are five standing committees of the Board: Audit Committee; Leadership and Compensation Committee; Finance Committee; Mergers and Acquisition Committee; and Corporate Governance and Nomination Committee. However, if needed, new committee may be established or old committee may be disassembled.[33]

According to the Corporate Governance policies and Committee's charter, the Leadership and Compensation Committee annually reviews and approves (either as a committee or together with the other independent directors) composition and value of compensation for the CEO. Additionally it should communicate in the annual Board Compensation Committee Report to shareholders the required disclosures.[34]

CEO may or may not annually serve on the Board as Chairman; however, necessity of his presence at the Board should be annually reviewed by the Board.

CEO profile: Joseph Joe Tucci, yrs[35] (tenure in the contract: 2001 – present; 14 years). Mr. Tucci is an aggressive and outspoken leader who

Career timeline[36]

2001 – present – CEO at EMC Corporation (Chairman since 2006)

2000 – COO at EMC Corporation

1993 – 1999 – CEO and Chairman at Wang Global (former bankrupt Wang Laboratories)

1990 – 1993 - Executive vice president of operations at Wang Global

1986–1990 - President of U.S. Information Systems at Unisys Corporation

1970–1986 - systems programmer, followed by several other positions at RCA Corporation

Problem description. Joe Tucci has already been the Company CEO for 8 years. Starting from 2003 EMC started to acquire specialized companies in order to become the leader in software-defined storage. Soon enough the EMC was expending not only in storage but in virtual infrastructure (VMWare) provision;

[31] Refer to Corporate Governance guidelines: http://www.emc.com/collateral/corporation/corp-gov-guide.pdf

[32] Refer to Corporate Governance guidelines: http://www.emc.com/collateral/corporation/corp-gov-guide.pdf

[33] Refer to Corporate Governance web page: http://www.emc.com/corporate/investor-relations/governance/board-committee.htm

[34] Refer to the Leadership and Compensation Committee Charter: http://www.emc.com/collateral/corporation/charter-compensation-committee.pdf

[35] At the time when he started serving as CEO

[36] Refer to Reference for business: http://www.referenceforbusiness.com/biography/S-Z/Tucci-Joseph-M-1947.html; Refer to App. 7 to find data on parameters evaluation

the Company is on the way to provide enterprises with an integral IT-as-a-Service (ITaaS) solution. Complexity and virtualization of the products were increasing from virtualized IT-owned application in customer companies through Enterprise critical applications to complete virtualization of IT business. The second stage of this transformation started in year 2009. The milestone phase was identified for the next year 2010 and further development was to be checked further along in year 2013.[37]

Current incentive plans. Compensation contract at EMC puts larger emphasis at long-term incentives that comprised from 2009 till 2013 48.8% and 77.3% respectively, which reflects intention to link remuneration of the CEO to attainment individual and corporate longer-term strategic objectives and alignment of CEO interest with the shareholders' interest. CEO compensation consists of the following parts: base salary, non-equity incentives (short-term and long-term) and equity incentives (performance-based stocks, time-based stocks and stock options). The Tab. 9 provides an overview of compensation value and composition in years 2009-2013.

Table 9: CEO compensation at EMC.Source: rendering from DEF 14A proxy statements

Compensation, ths USD	**2009**	**2010**	**2011**	**2012**	**2013**
Salary	872,308	1000	1000	1000	1000
Bonus	0	0	0	0	0
Stock awards	5995,8	7355,9	8408,713	12697,669	9426,404
Option awards	962,085	1337,077	1557,752	1310,657	650,417
Non-equity incentive plan	1068,42	2592	2140,869	1467,36	1260,058
All other copmensation	149,15	151,184	131,523	116,545	309,079
Total compensation	9047,763	12436,161	13238,857	16592,231	12645,958
% of STIP	10%	13,40%	12,80%	7,50%	77,30%
% of LTIP	48,80%	46,40%	47%	69%	12,20%

Non-equity incentive plan (Cash bonus plan): Non-equity incentive plans are annually designed to motivate the CEO to achieve specified corporate, strategic, operational and other financial performance goals. They require attainment of a threshold level performance to obtain compensation. For CEO non-equity incentive plan consists of two parts: the Corporate Incentive Plan (CIP) corresponding to longer-term goal achievement and the Management by Objectives Plan (MOP) mirroring short-term metrics and functional goals attainment. Through attainment of MBO objectives that are set out by the Compensation Committee the CEO receives semi-annual cash payments whereas through CIP top chief executive is semi-annually evaluated based on several metrics and can receive up to 200% of target bonus opportunity set out for him by the Compensation Committee (subject to negative discretion if needed). The performance targets used are Earnings per Share (non-GAAP adjusted EPS), Revenue and Free Cash Flows (FCF). The corresponding weights are 50%, 30% and 20% respectively. Actual performance against target metrics is presented in Tab. 3.8.

[37]Refer to EMC Investor relations web page: http://www.emc.com/corporate/investor-relations/strategy.htm

Performance stock units and performance stock options: Performance stock units and performance stock options are usually provided for 3-year vesting and then they become granted upon attainment of the performance targets. Performance targets used in this evaluation are also EPS and Revenue since the Compensation Committee believes that growing revenue and EPS leads to long-term shareholder value. The weights are 60% and 40% respectively. Actual performance against target metrics is presented in Tab. 10

Table 10: Target and actual performance at EMC.Source: rendering from DEF 14A proxy statements and 10-K annual reports

Performance	**2009**		**2010**		**2011**		**2012**		**2013**		**Weights**	
Target / Actual	T	A	T	A	T	A	T	A	T	A	**for NEIP**	**for LTEP**
Revenue, bln	15	14	16	17	19,6	20	22	21,7	23,5	23,2	30%	40%
EPS, USD per share	0,87	0,9	1,12	1,26	1,46	1,51	1,7	1,7	1,85	1,8	50%	60%
FCF, bln USD[38]	0,87	1,27	1,42	3,44	4	4,43	4,9	5,02	5,53	5,51	20%	

We test the model using long-term non-equity incentive plans as well as performance equity granted in year 2010 based on achievement of target performance goals. Therefore, we evaluate attainment of financial results based on two weighing scales (for non-equity incentive plan and for performance stock units and options).

Model illustration and reality check. Overall model results are presented in Tab. 11. According to the model EMC should not change the strategy of the Company (and therefore, the CEO) after the first period due to successful results and consent of the Board with the realized strategy. The modeled compensation after the first period should amount to 2.489 mln USD whereas the actual non-equity incentive plan in this period was equal to 2.592 mln USD. The modeled remuneration for the second period should have been 0 whereas in real case it was 1.260 mln USD. The game is finite, which is why we can hypothesize compensation for the second period is 0 whereas in real life we keep incentivizing the CEO to exert efforts and execute the chosen strategy.

Table 11: Model results for EMC case. Source: own rendering

q_0	$\overline{e_1}$	$\underline{e_1}$	$\overline{e_2}$	$\underline{e_2}$	p_G	c	R
0,86	0,7	0,44	0,8	0,4	0,91	150	138

$\triangle e_1$	$\triangle e_2$	p^0	p^1	$q_0^{l,l}$	$f(q_0^{l,l})$	$q_1^{l,l}$	$f(q_1^{l,l})$
0,26	0,4	0,14	0,78	0,03	0,95	0,38	11,25

$w^{h,h}$	$w^{l,h}_{S_1=S_0}$	$w^{l,h}_{S_1\neq S_0,new}$	$w^{h}_{S_1=S_0}$	$w^{l,h}_{S_1=s_G=S_0}$	$\triangle f$	Change?
375	2637,62	480	2489,07	345,95	29,05	No

[38]FCF was calculated on per share basis in years 2009 and 2010.

Incentive plan practice in eBay

Company profile. eBay Inc. (eBay), incorporated on March 13, 1998, operates at the commerce market through three business segments: Marketplaces (online commerce), Payments (financial services), and GSI (logistics). EBay provides platforms, tools and services to facilitate online and mobile commerce and payments. The revenue streams stem from transactions fees and advertising services.[39]

Ownership structure. The majority of equity in monetary terms (66.91%) belongs to the institutional investors; mutual funds won 26.69% of total equity whereas 6.4% belongs to insiders. According to Morningstar, the largest 20 institutional investors and mutual funds possess only 33.15%, which confirms our assumption on low concentration of ownership in the U.S. public companies.[40] Therefore, we will consider the Board of Directors as a determining decision-making force in strategy and compensation setting.

Board of Directors. Corporate Governance guidelines establish rules for the Board of Directors, so they act in the best interests of the shareholders and eBay itself. The size of the board is determined by the corresponding resolutions that evaluate the needs of business on a regular basis. The Board consists of at least the majority of independent directors. It is also recommended that the CEO is on the Board and up to several former executives serve at the Board for the best interests of the shareholders. The Board is responsible for selection and appointment of the CEO.[41]

There are five existing committee now: the Audit Committee, the Compensation Committee, the Corporate Governance and Nominating Committee, the Non-Officer Option Committee, and the Strategic Investment, Acquisition, and Disposition Committee.

According to the Committee Charter, the Compensation Committee sets compensation levels for the CEO; it conducts evaluation with assistance of with the independent compensation consultant (CEO is not present during these meetings).[42]

Within Say on Pay practice the Board increases investors engagement in reviewing and providing feedback for the compensation program. Shareholders cast their advisory vote and the Board is intending to increase provision of direct feedback in regard to remuneration packages.[43]

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[39] Refer to Reuters: http://www.reuters.com/finance/stocks/companyProfile?symbol=EBAY.OCuriously, eBay also created an open source platform to develop software and solutions for commerce (more than 800,000 members)

[40] Refer to Morningstar:http://investors.morningstar.com/ownership/shareholders-overview.html?t=EBAY&region=usa&culture=en-US

[41] Refer to eBay Investor relations web page: http://investor.ebayinc.com/corporate-governance-document.cfm?DocumentID=727

[42] Refer to the Compensation Committee Charter: http://files.shareholder.com/downloads/ebay/0x0x646152/b556f694-7b2c-4860-bd26-bf63ad018f6f/eBay_COMPEXHIBITA-CompCommitteeCharter_FINAL.pdf

[43] Refer to DEF 14A Proxy statement (2014) retrieved from the U.S. SEC EDGAR database

The Board in year 2011 encompassed 11 members, 9 of which were independent.[44] These numbers will be used for calculation of probability of successful strategy identification once the model is tested in this case. Furthermore, the CEO is not the Chairman of the Board (Mr. Omidyar is the Chair), which can mean lower probability of the Board being captured by the CEO and dictated in regard to strategic and compensation decisions.

CEO profile: John Donahoe, 47 yrs[45] (tenure: 2008 – present). Mr. Donahoe is a seasoned and highly qualified top manager who was prepared to become eBay CEO during Ms. Meg Whitman's tenure (being President of eBay Marketplaces).

Career timeline[46]

2008 – President, CEO and Director at eBay;

2005 – 2008 – President of eBay Marketplaces, responsible for eBay's global e-commerce businesses;

1999 – 2005 – CEO and Worldwide Managing Director at Bain & Company;

1982 – 1999 – Managing Director at Bain & Company.

Problem description. After eBay spectacular growth with Ms. Meg Whitman, the company was starting to struggle as its marketplace business was starting to slow down whereas PayPal business unit was gradually picking up. In the face of the crisis and increasing competition in the marketplace space Mr. Donahoe was to strengthen eBay retail position (acquisition of GSI Commerce in 2011) and keep growing financial services division. Whilst balancing the retail and financial services business units, Mr. Donahoe was then pursuing a growth strategy at the mobile commerce and mobile payments market, trying to capture a share not only at the online commerce market but commerce in general. Since the conventional online auction business still amounted to 7.4 bln USD against 5.6 bln USD generated by PayPal (2012), the forecasted relationship by 2015 is 52% to 48% (11.5 bln USD against 10.5 bln USD).[47]

In 2010 eBay was turning around the internal structure of businesses and assessing possible strategic directions. Therefore, it is an important milestone in turnaround strategy implementation.

Current incentive plans. CEO compensation structure in eBay is skewed toward performance-based components since the Compensation Committee believes in rewarding executives' efforts that lead to successful strategy implementation. In 2010 non-equity incentive plan and performance-based stock units accounted for 15% and 21% respectively whereas in 2013 the same components amounted to 12% and 40% respectively. This evolution of compensation structure within the company

[44] Refer to DEF 14A Proxy statement (2012) retrieved from the U.S. SEC EDGAR database

[45] At the time when he started serving as CEO

[46] Refer to Forbes: http://www.forbes.com/profile/john-donahoe/; Refer to App. 7 to find data on parameters evaluation

[47] Veverka M. (2013) Unplugged: Ebay's impressive run under CEO John Donahoe. USA Today. Retrieved from: http://www.usatoday.com/story/tech/columnist/veverka/2013/04/01/ebay-amazon-att-meg-whitman-john-donahoe/1995211/

shows stronger belief and focus on equity-based remuneration for performance. Total performance-dependent part of compensation exceeds 75% (including time-based stock units and options). Tab. 12 provides an overview of executive compensation throughout the period of 2008-2013.

Non-equity incentive plan. For eBay this part of compensation program reflects achievement of short-terms objectives, in other words, it aligns CEO remuneration with annual operational goals (however, the Compensation Committee can review and change the length of the performance period). Foreign-exchange neutral revenue (calculated on a fixed foreign exchange basis; FX-neutral), net income, net promoter score improvement, employee engagement improvement and individual performance are metrics against which yearly performance is assessed. Net promoter score improvement is a proxy for customer satisfaction; in such a customer oriented business it is important that it is properly measured and improved on year-by-year basis. Weights for evaluation are the following: 65% for the financial metrics in total (equally divided for two parameters), 25% is for individual performance, 5% is devoted to customer satisfaction metric and 5% is devoted to employee engagement. Since evaluation in 2013 slightly changed and employee engagement seem not to be taken into account, moreover, proxy statement doesn't reflect individual performance metric for the CEO, we recalculated weights of the above mentioned metrics.[48] Moreover, all metrics have a minimum threshold; if performance is below this threshold the CEO is not paid anything; otherwise he is paid according to a scale of multiples (in regard to target incentive plan that is linked to the base salary).

Table 12: CEO compensation at eBay. Source: rendering from DEF 14A proxy statements

Compensation, ths USD	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Salary	879,808	934,615	920,673	945,577	970,353	993,269
Bonus	500	522,917	736,538	0	0	0
Stock awards	5167,156	4450,388	5586,045	8854,607	23729,96	8855,064
Option awards	6364,098	2483,682	3735	3799,993	2000	2199,263
Non-equity incentive plan	0	1568,752	1158,575	2688,984	2844,346	1620,27
All other compensation	279,108	172,394	245,655	167,367	160,42	165,508
Total compensation	13190,17	10132,75	12382,49	16456,53	29705,08	13833,37

Performance-based restricted stock units (PBRSUs). The Compensation Committee offers two-year performance-based restricted stock units for the CEO based on attainment of several performance metrics, namely FX-neutral revenue, non-GAAP operating margin and return on invested capital (ROIC). PBRSUs are granted one or two years prior and vested to the CEO based on the performance. Thereby for example at the end of year 2010 the CEO was allocated (provided the goals are achieved) PBRSUs granted in year 2009 (performance period 2009-2010) and at the beginning of year 2010 (performance period 2010-2011).[49] Revenue and

[48] New weights are: 46.43% for financial metrics and 7.14% for customer satisfaction.

[49] Yet the portion of performance period 2010-2011 PBRSUs is not to be granted until after the end the performance period even though one-year targets are achieved.

operating margin metrics are weighted equally, then a resulting normalized measure is modified by a coefficient related to ROIC.

Performance share units. Another component that is paid out at some performance periods based on Total Shareholder Return (TSR). However, in 2013 he target value was not reached and in 2010 performance shares were not paid out, therefore, we do not analyze this component in detail. However, we hypothesize the same methodology as with non-equity incentive plan or performance-stock units can be applied to this compensation element.

Tab 13 demonstrates performance target metrics against the actual performance in two periods for case study analysis.

Table 13: Target and actual performance at eBay.Source: rendering from DEF 14A proxy statements and 10-K annual reports

For ST[50]	**2010**		**2013**		Weights	**For LT**[51]	**2010**		**2013**	
incentive plan	**T**	**A**	**T**	**A**		**incentive plan**	**T**	**A**	**T**	**A**
Revenue, bln USD	8,337	9,16	15,16	16,15	46,43%	Revenue, bln USD	8,96	9,16	29,5*	29,85*
Net Income, bln USD	2,25	2,299	3,61	3,56	46,43%	Operating income	2,76	2,7	7,72*	8,25*
Customer satisfaction, points	7	Achieved	N/A	Achieved	7,14%	ROIC, %	23,90%	25%	23,1%*	23,5%*
						TSR, %	N/A	N/A	72,90%	73,20%

* Figures for the long-term incentive plan are calculated on two-year basis; therefore, for all financial metrics should take into account results of the year 2012 and 2013.

Model illustration and reality check. The case is broken down into two periods: first period is years 2008-2010 and the second period falls into years 2011-2013. App. 7 provides details on CEO's history and evaluated variables. While assessing the modeled short-term incentive plan compensation, we calculate the resulting figures in accordance to their weights in eBay methodology. First period was rather successful for the company (the normalized result is 1000[52]) and the second period also exceeded expectations (the normalized result is 115). The model results are presented in Tab. 3.12. According to the model results the Board does not need to change the strategy. The incentive plan in the first period is equal to 4.981 mln USD whereas in the second period it amounts to 1.875 mln USD. In actual case the amount that was paid to the CEO in the first period was 1.159 mln USD and 1.62 mln USD for the second period.

[50]ST = short-term

[51]LT = long-term

[52]Calculated multiple corresponding to overperformance against the target metrics (metrics weighted in accordance to short-term and long-term incentive plan weights)

After recalculation of results for the long-term incentive plan (using another weighting scale) the model evaluation for the compensation was still the same. The possible reason for that is similar composition of both plans – short-term and long-term plans. Due to the similar assessment of performance in the short and long term, the model is insensitive to changes in financial performance variable. Therefore, resulted model numbers can be assessed as integral value of incentive plan. The actual figures for short- and long-term incentive plan is 4.496 mln USD for year 2010 and 7.175 mln USD for year 2013.

Based on this test we can derive the following insights. Firstly, it is arguable whether performance metrics for short- and long-term incentives should be the same. Certainly strategic goals (e.g. growth in the next 3 years) correlate with operational objectives (e.g. revenue growth per annum); however, it creates instruments for additional rent extraction. Once a strategic goal is broken down into series of operational objectives, remuneration mechanism should take into account overlapping of two metrics and compensation components. Secondly, once there is such an overlap in performance metrics, the model can be used for evaluation of integral incentive plan (short- and long-term incentive plans).

Table 14: Model results for eBay case. Source: own rendering

q_0	$\overline{e_1}$	$\underline{e_1}$	$\overline{e_2}$	$\underline{e_2}$	p_G	c	R
0,91	0,75	0,4	0,83333	0,56667	0,81818	500	1000

$\triangle e_1$	$\triangle e_2$	p^0	p^1	$q_0^{l,t}$	$f(q_0^{l,t})$	$q_1^{l,t}$	$f(q_1^{l,t})$
0,35	0,26667	0,3125	0,5625	0,07042	2,11268	0,58824	17,6471

$w^{h,h}$	$w^{l,h}_{S_1=S_0}$	$w^{l,h}_{S_1\neq S_0,new}$	$w^{h}_{S_1=S_0}$	$w^{l,h}_{S_1=s_G=S_0}$	$\triangle f$	Change?
1875	5972,11	3333,33	4981,04	1847,11	27,8873	No

Other cases

After the applied procedure was tested on 4 cases of U.S. public companies fromm retail and IT-industry, additional 10 cases of U.S. public companies from those industries were considered. The following result were presented in Table 15.

As can be seen from the Table 15, our model showed good results for the sun of two periods for five of the considered companies (Fred's, Dollar Tree, Barnes & Noble, Lowe's Corporation, Blackbaud), but is has some deviations in certain periods and, on the whole, is working better for the retail industry.

More than that, it worth mentioning that the model is working better in case of changing both strategy and CEO after the first period. It could be explained by the fact that the model suppose new CEO has no reputational risks and historical effects almost do not influence the incentive plan.

Also there is a practice of a partial payout of incentive packages in IT-companies even in case of failure to achieve the target performance goal set by the board of directors, but the model itself supposes for this case there is no incentive payout possible for a manager.

Moreover, there is a common tendency across 8 of 10 examined companies to overpay their CEO based on the results of theoretical modeling. Of course, some

Table 15: Summary results

Company	q_0	Change of strategy		Compensation after 1st period, million $		Compensation after 2st period, million $		Sum of compensation for two periods, million $	
		Fact	Model	Fact	Model	Fact	Model	Fact	Model
Fred's, Inc.	0,75	No	No	1,345	1,300	0,000	0,000	1,345	1,300
Dollar Tree, Inc.	0,545	No	No	1,800	3,000	1,900	0,450	3,700	3,450
Kohl's Corporation	0,75	No	No	2,145	1,750	0,535	0,000	2,680	1,750
Barnes & Noble, Inc.	0,625	Yes	Yes	0,000	0,000	2,604	2,848	2,604	2,848
Lowe's Companies, Inc.	0,6	No	Yes	2,225	2,181	1,500	0,525	3,725	2,706
Yahoo, Inc.	0,67	Yes	Yes	1,500	0,000	1,120	1,250	2,620	1,250
Blackbaud, Inc.	0,72	Yes	Yes	0,437	0,000	0,870	1,370	1,307	1,370
Blucora, Inc.	0,5	No	No	0,540	0,000	0,450	0,216	0,990	0,216
Linkedin Corporation	0,875	No	No	0,570	0,000	0,636	0,450	1,143	0,450
CA Technologies, Inc.	0,8	Yes	Yes	1,500	0,000	1,764	1,790	3,264	1,790

companies can save money and fire their CEO, but what happens in real practice is that this step would hurt the reputation of the company on the labor market of top-management. Also, companies do not limit their operation by one strategy only as considered in the model, but their business is rather diversified, so the board of directors often enough set a compensation package based on broader range of factors than those considered in the paper.

Besides, the model considers a game for two periods that sets huge reputational risks for those periods. In real business practice strategies are implementing for longer periods and it is possibly worth considering more periods in theoretical modeling as well to get more precise results, probabilities of outcomes and more smooth risks for players.

So, for the model to be more precise in cases of low business results it was suggested to introduce new coefficients $\varepsilon \ E$. Those parameters set the percentage of the maximum incentive package in case of either failure to achieve a target performance goal or achieving better result than that expected. And it worth mentioning that those coefficients are subject for individual setting for each company and should be determined by each board of directors.

7. Conclusion

The research paper represents total amount of 10 case studies of modeling of incentive packages for CEO of U.S. public companies in retail and IT-industries. It was demonstrated in the paper that the theoretical instrument could be applied as an instrument of valuation of incentive compensation for the better motivation of high level of efforts from CEO for corporate strategies implementation.

Furthermore, the chosen mechanism introduced reputation as an important factor of influence on manager's efforts application. Therefore, the CEO cares not only for monetary reward but also considers reputational risks in case of low performance, which is in line with current executive compensation research and corresponding concepts of talent.

We have also addressed the issue of setting performance objectives and goals and concluded that compensation composition can have adverse impact on efforts application (in the form of opportunistic behavior) by the CEO if similar performance metrics are used for design of short- and long-term incentive plans.

The novelty of the given research paper is formulation of methodology how to evaluate parameters in the chosen model, so it can be applied on actual company cases.

We realize that incentive methods are sensitive to international corporate governance regulations and current practices. Since European corporate governance differs with the U.S. practices, results of the methodology cannot be applied directly but taking into account European specificity methodology can be adapted and tested in different environments.

Since development of Russian public companies was following the U.S. example, we can assume that managerial implication for the Russian public companies is more structural and relevant for management control. In order to allow the board monitoring the CEO's efforts (hereby strengthening corporate governance), boards of directors should be composed of the majority of independent directors who represent shareholders' interest, not having other agenda in mind. There is lower opportunity to capture or collude with the board once composition is skewed toward independent directors.

Proven its applicability on example of the U.S. public companies in retail and technology industries, the model still has limitations and can be further improved. First of all, the game implies rationality of players, which is not always the case in reality. Even though we introduce the concept of reputation that implies non-monetary stimulation, rationality in the model still remains an issue.

The applied procedure with minor amendments can be used as a secondary instrument in the U.S. public companies to evaluate incentive plans of CEO. Except for companies, some other researches like us could be interested in that methodology. Consulting companies could enrich their portfolio of instruments by introducing the considered model.

Appendix 1. The base model solution

This model is a base game theoretical interpretation of the principal-agent phenomenon whose objective is to model the incentive plan of CEO compensation (performance-based pay component). The principal (owner, shareholder or investor) hires an agent (CEO) to implement a company strategy (strategic decision) in the subsequent time, followed by the principal's decision to replace or leave the agent. This model is a non-cooperative dynamic game; a modification of this base model is analyzed with scrutiny in Chapter 1. In this game the company CEO is incentivized not only materially but also non-materially (he cares for his/her reputation).

The underlying assumption of the model is that the company strategy *cannot* be amended in the 2nd period after it has been chosen in the 1st period.

All variables and assumptions are similar to the game described in the text.

Interaction between the principal and the agent is represented in the form of a decision tree in Fig. 3. Dotted lines incorporate the same information sets, in other words the player with the move cannot differentiate between nodes within the information set. Several branches are not depicted in detail due to the fact that the outcome will never occur. Branches where CEO exerts low efforts are analogous to branches where s/he exerts high efforts; the only difference is in probabilities.

The following changes should be considered.

Based on Bayes' formula, reputation after the 1st period is calculated differently:

$$q^i = \begin{bmatrix} 1 \text{ if } R_1 = R_h, \\ q^l \text{ if } R_1 \ = R_l, \end{bmatrix} \tag{23}$$

where reputation of the manager after the 1st period with low performance $R_l = 0$ (probability that the manager is good) is:

$$q^l = \frac{q_0(1-e_1)}{q_0\,(1-e_1) + 1 - q_0}. \tag{24}$$

Reputation after the 2nd period is the following:

$$q^{i,j} = \begin{bmatrix} 1 \; if \; R_1 = R_h \; and/or \;\; R_2 = R_h, \\ q^{l,l} \; if \; R_1 \; = R_l \; and \; R_2 \; = R_l, \end{bmatrix} \tag{25}$$

where reputation of the manager after the 2nd period in the light of two periods with low performance $R_l = 0$ (probability that the manager is good) is:

$$q^{l,l} = \frac{q_0(1-e_1)(1-e_2)}{q_0\,(1-e_1)\,(1-e_2) + 1 - q_0}. \tag{26}$$

Payoffs of each player are described the same as in the modified game in section 3.

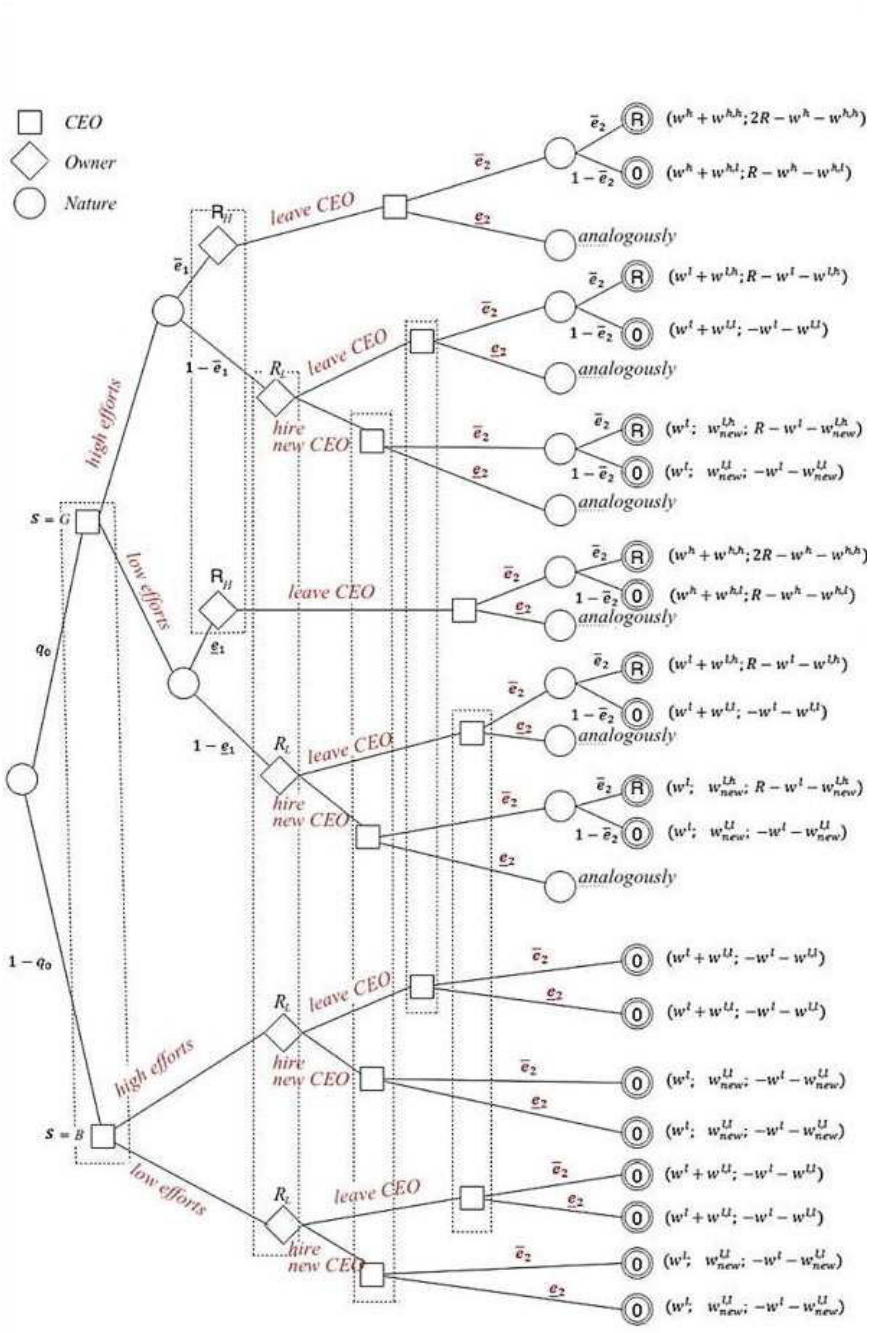

Fig. 3: Game tree

Solution of the model. Compensation contract is accounted for the solution of the model. Equilibrium strategies for the agent and the principal constitute the overall Nash equilibrium; the model is solved by backward induction.

Let us consider the last move of the game where the agent makes a decision about the level of efforts. In each sub-game the manager has 2 alternatives: exert high level of efforts $\overline{e_2}$ or shirk and exert low level of efforts $\underline{e_2}$. High efforts mean higher payoff for the principal and thus is more desirable.

Let us denote conditional probability that the chosen strategy is successful (accounted for the Company performance in the 1st period) as p^i:

$$p^i = \left[\begin{array}{l} 1 \text{ if } R_1 = R_h, \\ p^l \text{ if } R_1 = R_l, \end{array} \right. \tag{27}$$

where

$$P^l = \frac{q_0(1-e_1)}{q_0\,(1-e_1)+1-q_0}. \tag{28}$$

In order to find compensation value we are required to solve linear programming problem: the principal maximizes his expected payoff by minimizing the agent's expected compensation. The objective function looks as follows:

$$\min \left[p^i \left(\overline{e_2}\ w^{i,h} + (1-\overline{e_2}\ )\, w^{i,l}\right) + (1-p^i) w^{i,l}\right]$$

subject to the following constraints:

Constraint on incentives compatibility (the agent must exert high efforts):

$$w^{i,h} - \ w^{i,l} \geq \frac{c}{p^i \triangle e_2} - \triangle f. \tag{29}$$

In case of a new manager (no reputational risk):

$$w^{i,h} - \ w^{i,l} \geq \frac{c}{p^i \triangle e_2}. \tag{30}$$

Constraint (the agent's expected payoff should exceed costs under high efforts):

$$p^i(\overline{e_2} w^{i,h} - \ (1-\overline{e_2})\, w^{i,l} + (1-p^i) w^{i,l} \geq c. \tag{31}$$

Constraint on limited liability: $w^{i,h} \geq 0$, $w^{i,l} \geq 0$.

Let us consider possible outcomes:

1. $R_1 = R_h$, then $i = h$. Hereby $p^i = 1$, $\triangle f = f\left(q^{h,h}\right) - f\left(q^{h,l}\right) = 0$. Then the linear programming problem is the following: min $\left[\overline{e_2}\ w^{h,h} + (1-\overline{e_2}\ )\, w^{h,l}\right]$

   subject to:

$$w^{h,h} - \ w^{h,l} \geq \frac{c}{\triangle e_2},$$

$$\overline{e_2} w^{h,h} - \ (1-\overline{e_2})\, w^{h,l} \geq c,$$

$$w^{h,h} \geq 0, w^{h,l} \geq 0.$$

   The first and fourth constraint are satisfied as equalities, therefore:

$$w^{h,h} = \frac{c}{\triangle e_2}, \tag{32}$$

$$w^{h,l} = 0. \tag{33}$$

   Compensation is the same for the old and new CEOs.

1. $\mathrm{R_1} = \mathrm{R_l}$, $\mathrm{i} = \mathrm{l}$, then $\mathrm{p}^i{=}p^l$, so it can be calculated according to the formula (28). If the agent is not fired, then $\triangle f = f\,(1) - f\left(q^{l,l}\right)$. Condition (29) looks as follows:

$$w^{l,h} - \ w^{l,l} \geq \frac{c}{p^l \triangle e_2} - \triangle f. \tag{34}$$

Condition (31) looks as follows:

$$p^l(\overline{e_2} w^{l,h} - \ (1 - \overline{e_2})\, w^{l,l} + (1 - p^l) w^{l,l} \geq c. \tag{35}$$

We need to choose the lowest compensation that satisfies these conditions, then $w^{l,l} = 0$. If (34) becomes an equality, then

$$w^{l,h} = \max\left[0;\ \frac{c}{p^l \triangle e_2} - \triangle f\right].$$

These values satisfy the condition (35), i.e. $w^{l,h} \geq \frac{c}{p^l \overline{e_2}}$. If this condition is not satisfied, then (35) becomes an equality. Hereby optimal compensation is as follows:

$$w^{l,h} = \max\left[\frac{c}{p^l \triangle e_2} - \triangle f; \frac{c}{p^l \overline{e_2}}\right], \tag{36}$$

$$w^{l,l} = 0. \tag{37}$$

Under these compensation values for the 2nd period the CEO will always exert high level of efforts since his expected payoff accounted for high efforts is higher than in the case of low efforts.

Now let us consider the principal's move. If after the 1st period the Company performance is high R_h, then $p^h = 1$, i.e. the agent is good and the strategy is successful. Therefore, it is unreasonable to replace the agent after high performance in the 1st period, so in such a case the owner always prefers to leave the old top manager in the Company.

If or the performance is low R_l, the principal has two alternatives: leave or replace the agent. In order to find out the principal's strategy, we need to compare his/her payoffs in both cases. For the principal it is optimal to stimulate high efforts of the agent if and only if the Company financial performance is significantly high: $R \geq \frac{\overline{e_2} c}{p^i (\triangle e_2)^2}$.

Let us consider the first move of the agent. He has 2 options again: exert high or low level of efforts. In order to find optimal compensation incentivizing to exert high efforts, the following linear programming problem should be solved:

$$\min \left[q_0 \left(e_1 \; w^h + (1 - e_1 \;) w^l\right) + (1 - q_0) w^l\right].$$

Subject to:

$$w^h - \; w^l \geq \frac{c}{q_0 \triangle e_1} - \overline{e_2} \left(w^{h,h} - \mathrm{w}^{l,h}_{S_1 = S_0}\right) - (1 - \overline{e_2}) \triangle f,$$

$$w^h \geq 0, w^l \geq 0.$$

The problem solution is the following when the first and the third inequalities become equalities:

$$w^h = \max \left[0; \; \frac{c}{q_0 \triangle e_1} - \overline{e_2} \left(w^{h,h} - \mathrm{w}^{l,h}_{S_1 = S_0}\right) - (1 - \overline{e_2}) \triangle f\right], \tag{38}$$

$$w^l = 0. \tag{39}$$

Considering these results it is transparent that the manager will exert high efforts in every sub-game in the 1st period in order to maximize his expected compensation.

Therefore Nash equilibrium strategies for both players are as follows:

1. For the agent: in both periods he should exert high efforts $\overline{e_1}$ and $\overline{e_2}$.
2. For the owner: regardless of the Company result after the 1st period he should leave the agent.

Expected compensation of the agent for 2 periods is the following:

$$E\left(w\right) = q_0 \left[\overline{e_1} \left(w^h + \overline{e_2} w^{h,h}\right) + (1 - \overline{e_1}) \overline{e_2} w^{l,h}\right]. \tag{40}$$

The game solution is demonstrated in Fig. 4.

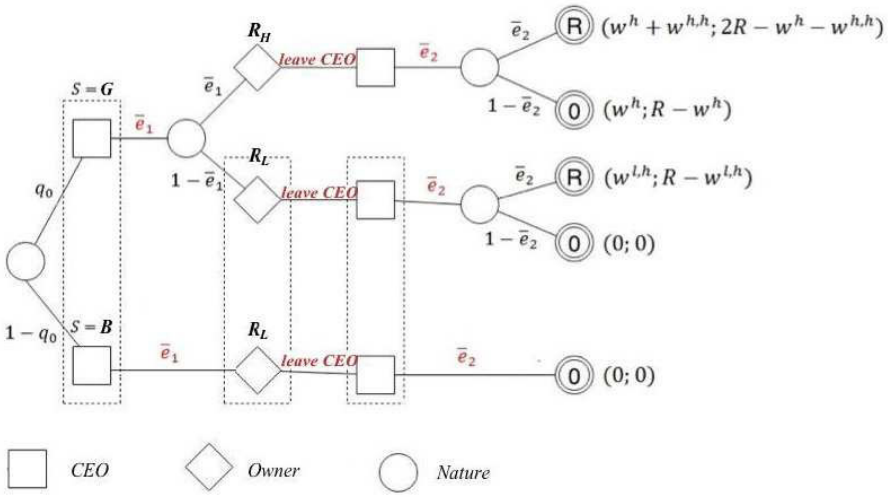

Fig. 4: Game solution

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