Incomplete and imperfect information for sales compensation

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Abstract

Sales force compensation represents the fix and / or variable payment by the company. To compensate agents based on the results, the company set a goal which is brought to their attention through the compensation plan. Applying the model of moral hazard, where the agent behavior cannot be verified, it cannot be specified in the contract what is the expected behavior of the agent. In order to make an offer to contract principal should know the effort that the agent will submit it to define the payment and the contract is determined optimally in trade between the two conflicting objectives of the two participants in the contract. Although agent behavior cannot be verified, the result of this behavior should be measurable at the end of the contract so that the employer may make the contract contingent on effort commission agent for sale of which is measured by the amount of earnings to the company.

Keywords

Incentive compensation, sales agents, incomplete information, contracts theory, moral hazard

JEL Codes: M 15, M 31

Sales compensation

Sales force compensation represents the payment of fix and / or variable salary by the company. The planning for sales force compensation depends on the segmentation of sales agents according to the products and services offered by the company or the account list of each agents, and other criteria. In order to compensate agents based on the results, the employer establishes an annual goal, most often expressed in the form of revenue that the company expects to receive from the contracts that the sales agent closes, objective to be achieved in accordance to eligibility restrictions imposed by the company which result from the segmentation.

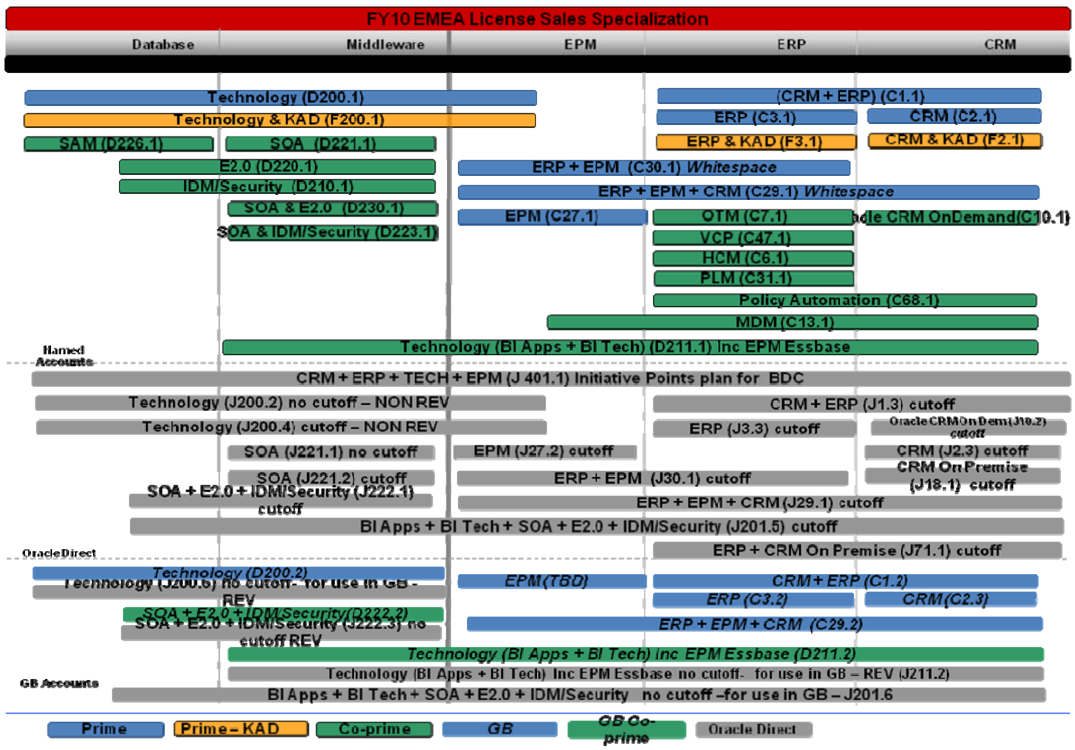
In order to transmit information to sales agents in a structured and understandable manner, the company presents this information in the form of a compensation plan that includes details about the annual target, eligibility for certain products under this role, sometimes the list of accounts (the territory list) or at least reference about where this information can be found.

"The role of agent sales and its compensation plan are most effective when the objective is as clear and singular as possible," says compensation consultant Ann Barnes[1]. Thus companies must ensure that sales agents have a clear objective about the products they can sell and the list of accounts.

The graphic illustration from Picture 1 explains easily the product eligibility criteria: sales force structure in Oracle based on the products that sales agents can sell on the market in Europe, Middle East and Africa for the most important line of business line called license. Oracle license line of business is divided in two major categories of products: technology and applications, which are also divided into several product categories, those shown in the

1 http://compforce.typepad.com/compensation_force/sales_compensation/

picture below on the second line. In this company, the product eligibility represents in fact that a sales agent may sell only products of that product category; they can actually sell any products, but will be compensated only for this product. The company limits the possibility to sell all its products in order to ensure that the agents are focused on their areas of specialization. Of course, agents may receive a small bonus if they sell other products and packages from other lines of business, but it depends from company to company.



Picture 1. The sales force specialization by products in Oracle
Source: Intern Oracle (2009)

Another important criterion is the list of customers or accounts to which sales agents can sell. The sales agents are divided are divided depending on the size of the accounts (very large, large, small and very small). In many companies this classification according to the size of the accounts is considered sufficient, but large companies requires delimitation for agents to know exactly which accounts they can address in order not to overlap for the same opportunities. There are several possibilities to detail the accounts for each sales representative. Most often the sales agents are divided by industry, like for example sales agents can sell to large accounts in the auto industry. Another way of classifying accounts is based on the location, the address of that account, usually for smaller accounts where the list of accounts number is very long. For example, the Sun's sales each agent receives a list of accounts (the company's names), but are listed also some postal codes attached to the list of accounts, therefore sales agents can create sales opportunities both with listed companies and companies with the address to these postal codes. Sales representatives are compensated as long as they sign contracts with those customers assigned to them by their employer. If the sales representative sells to an account that does not have designated by the company to him or her, but neither is assigned to another sales agent, he or she may ask to be added to its list of accounts and he or she will be compensated. Of course this may mean a whole process that may require several levels of approvals. In large companies such as Oracle, there is a

software system (a database) where can be found information about accounts and sales agents or teams who sell to those accounts.
The products the sales agents sell and list of accounts that are assigned to them represent the two most important criteria for eligibility of sales agents to be compensated, but of course some companies may choose to use other criteria for compensation eligibility such as period activity.

Compensation plan sales force

Compensation consultant Ann Bares[2] presented a study about how often companies review their compensation plans and why. The consultant also considers that it is important to analyze whether the recession year of 2009 was unprecedented in terms of revision of sales volume.
The study was conducted by World at Work, a non-profit association dedicated to knowledge of compensation, benefits and balance work - personal life, in November 2009 on a sample of 977 respondents. The main findings of the survey are:
- Most organizations review their compensation plans annually in recent years. Annual sales force compensation is not a unique phenomenon of the years 2008 / 2009, but actually is a model dating from 2005. There is a decrease in the proportion of the number of companies which have revised their compensation plans in the past four years, as a result of major changes made in response to strategy changes appeared in the turning of this decade.
- Improvements on the alignment between the incentives paid to sales force and the company strategy is the reason cited for reviewing compensation plans sales force, particularly in the last two years.

Tabel 1. Top reasons for revising sales compensation plans in 2009

Top reasons for revising sales compensation plans in 2009		
1	Improving sales force alignment between pay and company strategy	74%
2	Decreased complexity of compensation plans (e.g. reduction parameters, simplifying the formula)	37%
3	Changing performance measures to increase the focus on the profitability of sales force	35%
4	Changing performance measures so as to increase focus on development, promotion of new opportunities, sale of new products	35%

(Source: http://compforce.typepad.com/compensation_force/sales_compensation/)

As the study shows, most companies prepare an annual compensation in particular to ensure alignment between sales strategy and compensation model. So when the company establishes its business strategy, it sets the target for sales at the company level on each line of business, which then is subdivided by each product until it reaches the goal setting at sales manager's level and level of each sales representative. This objective is the value of sales contracts which the agent should sign up in order to receive the bonus targeted. Every company wants an increase in earnings from year to year, but it is important to estimate future earnings in a a realistic view of all aspects, such as the recent economic crisis. There is no standard method to determine the target company's annual standard or expected period; it depends on decision makers of each company.

[2] http://compforce.typepad.com/compensation_force/sales_compensation/

Compensation plan is the physical or electronic document through which sales representatives are aware of the sales objective or target it has to be achieved in that period in order to receive the commission or bonus. Anna Barnes[3] explains that the bonus target is the amount of commission that sales agent should receive if he can reach the sales target. The objective of sales volume can be expressed as a value of sales in that country's currency or other currency of reference (if the cost of manufacturing software is very small) or can be expressed as the profit of the company remaining after making the sale (if hardware products, electronic equipment and appliances) or even the number of units sold, according to the matrix that best fits the tasks and responsibilities of sales agents. To determine the compensation rate it is enough to apply a simple division between variable pay target (commission target) and sales target, value which is multiplied by 100 percent. This compensation rate is called flat compensation rate as sales agent is paid with the same rate regardless of the value of sales. Many companies apply this method of using this payment rate, uniform. Nevertheless there are companies that use progressive rates or accelerated in order to reward more those who manage to sell more than the objective and regressive rates or decelerate to limit gains after a certain point (an alternative for a threshold or cap value). Compensation plan depends on format and content from company to company, but overall the plan contains information about the sales target, commissions target and compensation rates and about the eligibility of the sales agent for certain products or accounts or any other criteria eligibility.

The way the sales plan is presented to sales agents depends from company to company, but not only, but also from country to country, depending on the laws of each country. In some European countries, under the law, the compensation plan needs to be physically signed by the employees and it is not sufficient that only that the compensation plans are presented to the employees or the acceptance in an electronic form. Also in some countries with a strong orientation for protecting employees, such as Germany, workers council are very powerful, for example they to do not allowing to change compensation plans from year to year in terms of eligibility criteria.

Principal and Agent in sales compensation model

The contracts theory has the objective to analyze the situations when the companies are trying to overcome the barrier of lack of relevant information in making decisions designed to obtain new information or to avoid the costs of their ignorance. Contracts theory models use game theory concepts and results in asymmetric information, incomplete and / or imperfect, resulting descriptions called principal-agent negotiation; the parties have a priori beliefs about information they do not hold and their review these beliefs as they run economic relations[4]. The party who proposes the contract is called the Principal and the party who accepts the contract is called the Agent. Both principal and agent may be individuals, public or private institutions, organizations, etc. Therefore, principal proposes the contract to the agent, who examines the contract and decides whether to sign or not. The agent will accept the contract if the utility obtained exceeds the utility that would obtain if it were to do not sign a contract. In many cases, the agent tries to negotiate in his favor. However, the Principal controls the definition of contractual terms.

The two parties involved in the contract have opposite interests: the cost of one party is actually profit for the other party (the commission paid sales representative is a cost for the Principal and sales representative effort is a return to Principal).

The Principal faces a risk because he cannot observe the agent behavior and in order to avoid this risk he could introduce incentives in the contract terms.

3 http://compforce.typepad.com/compensation_force/sales_compensation/

4 Stancu, S. (2002), *Teoria Contractelor. Negocierea şi derularea contractelor economice*, ASE Press, Bucharest, pg. 22-28

In the case of sales force compensation, the Principal is the employer, the company which proposes sales compensation method, and the Agent is an employee who may accept the offer in light of the benefits he or she has upon acceptance (compare with the situation when he or she does not accept or compare with other offers). If he or she accepts the offer of compensation, the agent will work to sell the Principal products in order to bring revenue for this one.

Information that Principal has is incomplete because of the lack of knowledge level about effort that the agent will make throughout the course of the contract, however it can measure its results at the end of the operation of the contract.

The contract that the company proposes to the agent is in fact the compensation plan by setting the contractual terms.

It is important to note that although the company proposes compensation plan, considering its overall objective to maximize the profit, it does not know the type of the sales agent whom offers plan (if workers or lazy), it makes the proposal in terms of incomplete and imperfect information. This is why the company should take into account when proposing compensation plan that agents may act differently depending on their type, if they accept the compensation plans.

Of course the company can analyze the evolution of sales agents in terms of results from year to year that can predict the type, but it can only be an estimate. It is even more difficult when the company needs to generate a compensation plan for the first time to a sales agent that just gets employed. In this case, the company can ask during the hiring process for recommendations from former employers, details of its activities or make assumptions based on the analyze of curriculum vitae (such as higher education in the trade). Another indicator that the Principal can use when the company proposes compensation plan is the number of opportunities already open by the agents, opportunities meaning those situations when agents have already discussed and negotiated with potential customers and the next year the completion of the contract follows. Thus, the employer should investigate certain information to pass the total ignorance barrier about agent's effort evolution in the period ahead, but will not have complete information, only partial, based more on assumptions. Unlike the company that proposes the compensation plan without knowing the results the agents will bring, the agent knows from the beginning all the information needed to measure the benefits he or she receives if accepts the compensation plan. However in order to get great results which means great benefits sales agents depends on many factors, not just their own effort. In general, the mathematical models of the contracts theory assume that agents get the maximum benefit if they make a maximum effort.

Sales representatives not only know information on benefits that are earned upon acceptance of the individual compensation plans, but they know or at least receive the documents about the entire process of compensation like all the eligibility criteria, terms and conditions of compensation such as: the formula for commission calculation based compensation plan, the frequency of payment, terms relating to the commission beyond a certain limit or implement a management discretion, terms for teaming agreements between two or multiple sales agents by which to share the value of sale etc.

Sales representatives have all necessary information to decide whether to accept or not the compensation plan. If not accepted, it all ends here, they will not receive any payment from the company, but if accepted, they will receive payment in accordance with its results, according to their achievements compare their targets specified by the company though the compensation plans.

Moral hazard model for sales compensation model

Model of moral hazard has the characteristic that the Principal, the company, cannot verify the agent behavior, so it can not specify in the contract what is expected behavior of the

agent, but it is very important for business to know the effort expected from sales agent in order to make a proposal.
Sales representative may give indication of his or her behavior by showing good or very weak results in previous contracts; in previous years when the sales agent had compensation plans and achieved its target set by the company, even exceeded in the a large proportion or the opposite side, failed to reach the target or failed to bring any income for the company. If the signal is good company should pay more to influence agent behavior in order to accept the proposed compensation plan.
Although it does not know what effort will make the agent when an employer or a company proposes a compensation plan to a sales agent he plan in such a way that the payment depends on the effort made by the agent for sales, which is measured by the total of revenue. The employer establishes an annual variable salary, in addition to the fix one which is guaranteed, payment that the agent receives depends on the total value of revenue he or she brings for the company, namely the effort, the actions that the agent carried in Principal's favor.
Due to the fact that Sales representatives are interested in obtaining a high commission, they will make a greater effort which is a benefit also for the company because a higher commission is possible only by closing as much as possible deals, leading to revenue for company which objective is to maximize profit. So both sides, both company and sales force have benefits from this link between the commission and the company revenue, both being able to maximize their benefits.
Considering the fact that the company proposes compensation plan under incomplete and imperfect information and that the sales agent effort can't be verified, the company proposes a level of effort, but it should ensure that this level of effort will be made.
Model of moral hazard actually has to solve the two problems, maximizing the benefits for the company which can be achieved only if the sales representatives accept the contract or compensation plan that the company offer, but they have also their own objective to maximize their benefits, their commissions.
Sales representatives have the objective to establish the level of effort to be made in order to maximize bonus or payment they may obtain from the company if they accept the compensation plan, which is expressed mathematically in terms of following form:

$$e \in \arg\_\max\{\sum_{i=1}^{n} p_i(\tilde{e})u(w(x_i)) - v(\tilde{e})\}$$

Sales representatives know that the employer cannot check their efforts and choose that level of effort that maximizes their objective, the commissions. To accept the conditions proposed by the company in the compensation plan, the sales agents want to meet the condition of rationality:

$$\sum_{i=1}^{n} p_i(e)u(w(x_i)) - v(e) \geq \underline{U}.$$

Thus, the mathematical model of moral hazard for sales compensation is expressed mathematically by the following equation:

$$\begin{cases} \max\sum_{i=1}^{n} p_i(e)B\left(x_i - w(x_i)\right) \\ \sum_{i=1}^{n} p_i(e)u(w(x_i)) - v(e) \geq \underline{U} \\ e \in \arg\_\max\{\sum_{i=1}^{n} p_i(\tilde{e})u(w(x_i)) - v(\tilde{e})\} \end{cases}$$

In the model of sales compensation, the effort variable is a continuous, the sales agents can have any value of effort. Mathematically is much easier to solve the problem if the agents can have only two types depending on the variable effort (effective or not), but in reality agents can have any value of effort.
Unfortunately if the variable effort is considered continuously, moral hazard problem becomes very difficult to solve, since one restriction is still a matter of maximizing:

$$e \in \arg\_\max\{\sum_{i=1}^{n} p_i(\tilde{e})u(w(x_i)) - v(\tilde{e})\}.$$

Therefore in contracts theory, in order to overcome this obstacle, this restriction of maximizing agent's benefits was replaced by its first-order conditions, which is expressed by the following restriction of participation:

$$\sum_{i=1}^{n} p_i'(e)u(w(x_i)) - v'(e) = 0.$$

But this restriction is not always equivalent to the problem of maximizing the agent's benefits, ensuring only necessary condition. If however it assumes that this reformulation of the condition of rationality is sufficient, the mathematical problem is the following:

$$\begin{cases} \max \sum_{i=1}^{n} p_i(e)\,(x_i - w(x_i)) \\ \sum_{i=1}^{n} p_i(e)u(w(x_i)) - v(e) \geq \underline{U} \\ \sum_{i=1}^{n} p_i'(e)u(w(x_i)) - v'(e) = 0 \end{cases}$$

Solving the problem above is done by Lagrangean method and obtain the same conclusion as for the discrete model, namely that a good result is a sign that, more likely, the agent make a greater effort.

This first order approach is not always accurate, but is the easiest way to solve the problem. Another way would be to introduce a type of distribution function depending on effort. Regardless of the method, the conclusion is the same, that the payment offered to the sales agents depends on the results obtained by them, namely the value of contracts that they bring the company revenue, the payment being the only way the company can influence their effort.

Therefore, the company plans compensation for its employees which requires them to receive some results for a particular payment. For example, in Oracle each sales representatives has an annual target, most often expressed in value and that purpose will receive some payment. If the sales representative achieves just partially the target, he or she will receive proportionately with their results.

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