A VECTOR METHOD FOR MEASUREMENT OF WORK MOTIVATION

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Abstract

One of the main trends of nowadays labour relations is increasing of role of work motivation, which directly affects a person's performance and duration of employment. Therefore, conceptualization and measurement of motivation becomes a priority in contemporary research. Although the first has a great number of scientific researches, the second is in need of new methods and techniques, which will be capable to measure work motivation force and present it numerically to compare results. Based on summarizing the results of the authors' research on work motivation measurement with focus on Vroom's expectancy theory, the paper suggests a new vector approach to the work motivation, which provides advanced analytical and predictive possibilities.

The method allows to predict the possibility of voluntary termination of employment depending on expected employee's value of motivation. The vector method is offered as a mechanism for major problems of inherent in the typical treatment of expectance theory. The method combines the theoretical variables in a manner that is consistent with the traditional formulation and does not depend on assumptions which conflict with such theories as theory of bounded rationality and prospect theory.

Key words: work motivation, expectancy theory, measurement of motivation, labour relations.

JEL Code: J3, J5.

Introduction

Expectancy theory by V. Vroom, he proposed in 1964 in the «Work and Motivation», is one of the most profound theoretical developments concerning the procedural aspects of the motivation of the individual. Built on the basis of earlier developments (Lewin, Tolman, Edwards), expectancy theory has several advantages comparing with other concepts of motivation within the labor behavioral relations.

At first, it allows to evaluate the value of motivation in the quantities available for a comparison between different persons or workers.

According to the Vroom's model of motivation, the concept of expectancy has probabilistic nature and can be treated as a value of mathematical expectation of certain events. In this aspect of expectancy theory inherits all the issues of previous concepts of probability , primarily the concept of subjective probability, which is extremely close to the concept of expectation presented by Vroom. There are two groups of critical positions in relation to all probabilistic concepts.

First, it is a methodological difficulty of obtaining reliable information about the subjective probability: It is difficult to evaluate a particular individual opinion on the likelihood of a future event. And the second question - how accurate is the information obtained from a multiplicative model?

Considering the first issue, there are two basic approaches - the method of verbal interviews (Diggory, Rotter , Fitzgerald, Blumenfeld) and analysis of real choices and decisions (Preston, Baratta). The first method is based on the assumption that the verbal evaluation given by a respondent about probability of a future event is highly correlated with the assessment of subjective probability. Although the application of these techniques allowed to obtain representative data , the use of techniques associated with the complexities, which are typical for all the polling methods: the complexity of tools , inability to validate the responses and the need to motivate respondents.

The second approach is based on the analysis of individual's choices and actions. For instance,when an individual is willing to pay no more than 5 units for the opportunity to win 50 units, subjective probability is estimated at 10%.

Despite the correspondence between such estimates and mathematical probability of events, empirical studies have shown that at low values of probability subjective evaluations of probability exceed mathematical probability, at high values on the contrary subjective probability is lower, than the matimatical probability of an event.

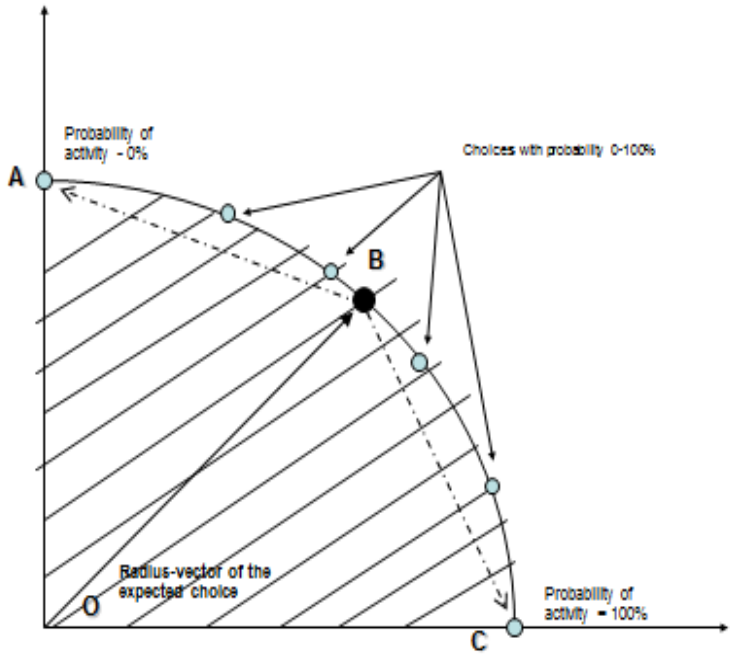
In addition, there are a number of organizational difficulties: it is necessary to have information on the individual's previous choice or have the ability to monitor an individual's behavior, provide non-random selection and the non-specificity of the situation, and finally, there is a problem of determining the role of expectations in the demonstrated behavior. A partial solution to the problem based on the decision-making model (Davidson, Siegel 1957) but the issue remains actual today.

1 Vector Understanding of Concept of Expectancy

The principal lissue of the probability approach to the motivation is an attempt to analyze entire function of subjective or objective probabilities of achieving certain levels of performance or reward.

A worker, evaluating the probability of extra reward as a result of an act x of 0.6 can make a negative desigion (desigion to be unactive) as well as if he evaluate this probability of 0.3 or even 0.1. Similarly, the opposite desigion (desigion to be active) also can be made when the person expects to get an extra reward with subjective probability of 0.6, 0.7 or 0.99. Obviously, all possible subjective expectations lead to only two desigions – to be active or to be unactive.

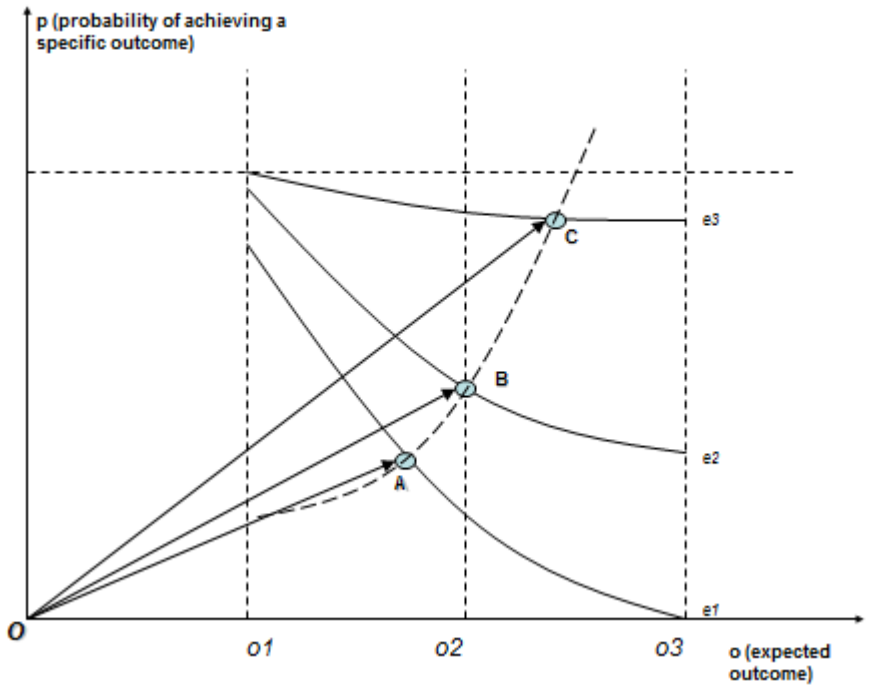
Fig. 1: Relation between subjective probabilities and final desicion to be or not to be active



Source: authors

In terms of Vroom's theory it means that it is possible to avoid the analyzing of entire probability function of performance depending on multiple levels of labor efforts or from function of expected reward depending on levels of labor performance.

Fig. 2: Subjective probability functions of achieving different levels of an outcome depending on different levels of labor effort



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Curves e1, e2, e3 illustrate subjective probability function of achieving specific level of performance o1, o2, o3 depending on certain level of expected labor efforts. The points A, B and C on the figure 2 shape the funtion of expected performance depending on expected labor efforts. For instance, if a person choose to make a low level of labor effort (curve e1), the probability of the low level of performance (o1) is maximal, to perform on the middle level (o2) is much less and the probability value of high level performance is assumed of 0.

The curve, formed by points A, B and C demonstrates the dependency of the performance level from the different levels of labor efforts and can be constracted in the coordinates of efforts and expected performance (that corresponds with function of instrumentality in Vroom's terms). Similarly, it is possible to construct the function of expected reward level depending from level of performance (that corresponds with Vroom's concept of Expectancy).

Therefore, it is possible to assume that expectaions can be described by the radius-vector and the coordinates of the vector are expected levels of labor efforts and performance.

This approach allows to avoid the analyzing entire function of subjective probability and does not use any probabilistic variables.

We believe that the analyzing of vectors of expectations is preferable to the Vroom's original approach based on the probabity measure of expectation. The vector approach requires a new model that allows to deal with vector understanding of expectation. To be consistent with Vroom's original formulation, the expectancy relating everu level of effort to every level of performance should be measured as well as expectancy relating every level of performance to every level of expected reward.

As stated before, each of the relations (effort-performance and performance-reward) can be constructed in bidemensional coordinate systems: effort-performance for the first relation and performance-reward for the second one. The actual expectations can be described by two radius-vectors, constructed in accordance with the model, presented on the figure 2. It is important to note here that expected level of performance is a joint dimension in this two coordinate systems and it allows to combine them into one system of coordinates (efforts – performance – reward).

2 Vector Model of Expectancy Theory

Building the model, it is necessary to make some fundamental assumptions which can be divided into two groups: assumptions, following to basic statements of the Vroom's theory and assumptions, ajusting the model two other motivational theories and economics.

First, the motivational process includes two parallel relations between levels of effort and performance on the one side and between levels of perforamnce and reward on the other side. To measure the motivation value it is required to evaluate each of them.

Second, the motivational force is a function of three variables – expectation (effort-performance), expectation (performance – reward) and valence. Vroom's definition of valense is as follows: An outcome is positively valent when the person prefers attaining it to not atteining it. An outcome has a valence of zero when the person is indifferent to atteining or not attaining it and it is negatively valent when he prefers not attaining it to attaining it (Vroom, 1964).

It should be noted, unlike the expectations which can be presented as a vectors, valence is a scalar which increase or decrease the modulus of vector of expectation and determines it's direction (positive or negative that corresponds with motivation to attain ot not attain a certain outcome (Hollenback, 1979).

Finally, vector of motivational force can be presented as a vector multiplication of vectors of expectation (effoers – performance) and expectation (performance – reward).

In equation form:

$$\vec{M} = \left(\overrightarrow{EX_P} \times \overrightarrow{EX_R}\right) \cdot V, \qquad (1)$$

where $\vec{M}$ - vector of motivational force;

EX_P (Performance Expectancy) – vector of expectation, that describes relation between expected effort and expected performance levels;

EX_O (Reward Expectancy) – vector of expectation, that describes relation between expected reward and expected performance levels;

V (Valence) – value of valence.

The value of motivational force:

$$\left|\vec{M}\right| = \left|\overrightarrow{EX_P}\right| \cdot \left|\overrightarrow{EX_R}\right| \cdot \sin(\angle \overrightarrow{EX_P}; \overrightarrow{EX_R}), \qquad (5)$$

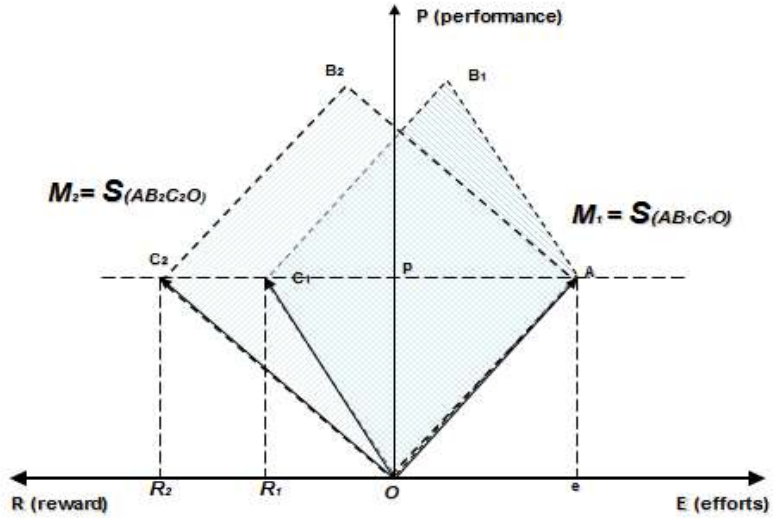
Where $\left|\vec{M}\right|$ - value of vector of motivational force;

$\left|\overrightarrow{EX_P}\right|$ – value of performance expectancy;

$\left|\overrightarrow{EX_R}\right|$ – value of reward expectancy.

Therefore, in addition to the analytical form, the motivational force within the framework of vector approach has the geometrical meaning: the value of motivational force is the area of the parallelogram, constructed one the vectors of expectations.

Fig. 3: Geometrical presentation of motivational force.



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Adding the geometrical meaning significantly expands the analytical possibilities of the model in comparison with original Vroom's formulation.

Conclusion

The purpose of this paper was to show how classic Vroom's expectancy theory can be modified in order to expand it's analytical capabilities. The vector model is logical and workable way to combine the variables in expectancy-value theory.

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