

влияние на удовлетворение работников, как рост доходов на 36 %. Это удовольствие может быть легко уничтожено из-за желания оценивать персонал. Регулярные оценки следует заменить беседами руководитель-подчиненный о том, что каждый из них ожидает от иного и от предприятия в целом, что необходимо сделать, чтобы они могли выполнять свою работу лучше. Без доверия не может быть речи об успешном мотивировании работающих.

**Ключевые слова:** кризис доверия, экономический рост, транзакционные расходы, доверие к работающему, оценка работающего, беседа руководитель-подчиненный.

**Lyubov Lypych. Interdependence of the Effectiveness of the Enterprise and the Level of Trust in the Employee.** Coming out of the global financial crisis, businesses have fallen into a deeper one – a crisis of confidence. Trust and economic progress are closely interconnected, the more we trust each other, the better we can work together, the higher chances of economic growth. Low-credence organizations are uncompetitive, and vice versa, those based on high trust have better opportunities to achieve predictable business outcomes in rapidly changing and stressful conditions. Confidence between business partners increases the market value of the enterprise and its profitability, as high reputation is accompanied by a reduction in the cost of monitoring partners, which in turn contributes to beneficial for both contracting parties flexible interpretation of agreements where, as a result of incomplete information, the ability to foresee all scenarios for the development of events is limited. There is a correlation between employee empowerment and profitability. Extremely important is the impact of trust on transactional expenses, which include the cost of obtaining the necessary information on prices and quality of goods, negotiating, contracting, entering into agreements, monitoring of their execution and legal protection of the rights of the owner in case of violation. The trust in the client, employee, supplier and loyalty that results out of it has positive impact on the cost of their communication. Oral agreement instead of laborious negotiations gets real weight then, especially in situations where innovation-oriented changes are taking place. In all these cases, trust acts as a filler of gaps in mutual understanding. It can be easily destroyed by a desire to evaluate the staff. Regular assessments should be replaced by conversations between the supervisor and the subordinate employee about what each of them expects from another, and from the company as a whole, what needs to be done, so that they can perform their work better. Without trust, there can be no talk of a successful motivation of employees.

**Key words:** crisis of trust, economic growth, transactional expenses, trust in the employee, employee evaluation, conversations between the supervisor and the subordinate employee.

Стаття надійшла в редакцію 03.11.2107 р.

UDK 338.45:630

**Anna Mokhniuk** – Ph. D. in Economics, Associate Professor of Economics, Security and Innovative Activity of Enterprise Department, Lesya Ukrainka Eastern European National University;  
**Iryna Volynets** – Ph. D. in Economics, Senior Lecturer of Economics, Security and Innovative Activity of Enterprise Department, Lesya Ukrainka Eastern European National University

### **Model of Functioning of Market of Forest Industrial Enterprises in the Conditions of Innovative Development**

It is stated efficient activity of forest enterprises on the market, under its variable conditions and optimal use of forest resources can be modeled by production dynamic linear problem of optimal planning in the article. It is proved at any important element of dynamic model of forest enterprises market development is the system of restrictions, which lies at any moment of time depending on market situation, size of forest resources and existence of diversified possibilities of their use.

**Key words:** model, forestry enterprises, production costs, innovative development.

**Formulation of Scientific Problem and its Significance.** Economic efficiency of activity of forest industrial enterprises always tend to grow irrespective of variation of market environment, development of social relations, consumers' preferences etc. Nevertheless real market conditions of forest management development by no means always promote optimal use of forest resources, rise of enterprises potential, their efficient activity and strengthening of market positions of forest enterprises on the market.

**Analysis of Last Researches and Publications.** The considerable impact on the solution of problems of the rational use and recreation of the forest resources, forming of organizational and economic mechanisms of the forest resource development was done by the leading foreign and national scientists such as V. Hrytsaichuk, A. Deineka, Yu. Koval, L. Malyuta, V. Pila, M. Rimar, Yu. Tunitsa, O. Furdichko and others. However, the analysis of the publications of these authors gives grounds for further research in this direction, taking into account the practical aspect of the problem under investigation.

**The aim of Research** is to develop a model of functioning of market of forest industrial enterprises in the conditions of innovative development to increase their competitiveness, adapt to changes in the external environment and the most complete satisfaction of consumers' needs.

**Presentation of Main Material and Argumentation of the Research Results.** Efficient activity of forest enterprises on the market, under its variable conditions and optimal use of forest resources can be modeled by production dynamic linear problem of optimal planning. Return on sales shall be selected as the criterial characteristic, which will most fully and objectively show maximum economic effect of activity, flexibility of production activity of forest enterprises to market conditions [1].

Formal record of the offered dynamic problem of efficient activity of forest enterprises, their production flexibility for the purpose of forest resources optimal use is as follows. It is necessary to find vector  $X = \{x_i\}$  – of structure of distribution of production activity of forest enterprises promoting maximum economic effect of the enterprise activity – receipt of maximum return. In other words, using its production capabilities to the maximum, every forest enterprise should direct its production activity for optimal development of forest resources in the quantity meeting existing demand of consumers' market.

It formalizes the optimality criterion, by which the best target function (1) is selected among the permissible plans, namely:

$$Z = D_t - V_t \rightarrow \max, \quad (1)$$

where  $D_t$  – is volume of revenue for forest enterprise production activity during the period  $t$  ;

$V_t$  – is volume of production costs from forest enterprise production activity during the period  $t$  [3].

An important element of dynamic model of forest enterprises market development is the system of restrictions, which due to which it is reasonable to set up the optimization problem at any moment of time depending on market situation, size of forest resources and existence of diversified possibilities of their use.

Let the forest enterprise develop  $N$  types of products of forest resources during the planning period  $t$  ( $t = \overline{1, T}$ ) and  $x_{it}$  – be volume of products of  $i$ -th type planned for laying in, manufacturing and sale during the period  $t$ . Every enterprise should form such plan of production activity of forest resources development from an available set of various types of forest enterprise products in order to get the maximum revenue on its sale. Then the revenue volume from the forest enterprise production activity on the market can be represented as follows:

$$D_t = \sum_{i=1}^N \overline{U}_{ii} \times x_{it}, \quad (2)$$

where  $\overline{U}_{ii}$  – is average predicted sale price of the forest enterprise product of  $i$ -th type during the period  $t$  ;

$t$  – is planning period;

$i$  – is type of product planned for laying in, manufacturing and sale during the period  $t$ ;

$N$  – is number of types of products;

$x_{it}$  – is volume of product of  $i$ -th type planned for laying in, manufacturing and sale during the period  $t$ .

Production costs ( $V$ ) of the forest enterprise shall include cost items for carrying out its production activity during the period  $t$  for laying in, manufacturing and sale of products of  $i$ -th type. Production costs shall cover direct (material, labor, capital etc.) and indirect costs (for keeping organizational and technological infrastructure, taxes, etc.), at that indirect costs can be considered a certain percentage from direct costs [2]. Consequently:

$$V_t = \sum_{i=1}^N (1 + \alpha) \cdot PV_{ti}, \quad (3)$$

where  $\alpha$  is factor of indirect costs for manufacturing  $i$ -th type of product during the period  $t$ ;  
 $PV_{ti}$  – are volumes of direct costs for manufacturing of  $i$ -th type of product of forest enterprise during the period  $t$ .

As costs spent by the forest enterprise shall consist of material resources ( $MV$ ) used for manufacturing of  $i$ -th type of product of forest enterprise; production costs ( $BV$ ); costs for development and preparation for manufacturing new types of products ( $IV$ ), then function of costs shall appear as follows:

$$V_t = MV_t + BV_t + IV_t, \quad (4)$$

where  $MV_t$  are material costs, including cost of main raw materials in the period  $t$  (costs for material resources of  $j$ -th type), costs of transportation and laying in.

Let material resources ( $j = \overline{1, J}$ ) of  $j$ -th type of be used in the process of  $i$ -th type of product of forest enterprise and  $m_{ijt}$  – is quantity of resources of  $j$ -th type of product of forest enterprise during the period  $t$ , then formula for determination of material resources appears as follows:

$$MV_t = (1 + q) \cdot \sum_{t=1}^T \sum_{i=1}^N \sum_{j=1}^J \overline{u_{tij}^*} \cdot m_{ijt} \cdot x_{it}, \quad (5)$$

where  $\overline{u_{tij}^*}$  – is average predicted price of material resource of  $j$ -th type for manufacturing a unit of forest enterprise product of  $j$ -th type during the period  $t$ ;

$q$  – is index of costs for transportation and laying in for manufacturing a unit of forest enterprise product of  $j$ -th type with resources of  $j$ -th type during the period  $t$ .

As material costs for manufacturing a unit of forest enterprise product of  $j$ -th type during the period  $t$  are restricted by volume of circulating assets of the forest enterprise during the period  $t$ , then:

$$(1 + q) \cdot \sum_{t=1}^T \sum_{i=1}^N \sum_{j=1}^J \overline{u_{tij}^*} \cdot m_{ijt} \leq v_t, \quad (6)$$

where  $v_t$  – is volume of circulating assets of forest enterprise during the period  $t$ .

Let us write down function for determination of volume of production costs ( $BV$ ) for manufacturing a unit of forest enterprise product of  $j$ -th type during the period  $t$ . Production costs can be represented as a sum of volumes of costs for labor payment that are directly connected to laying in, manufacturing and sale of forest enterprise product of  $j$ -th type during period  $t$  ( $BV_1$ ), operation and amortization of main capital ( $BV_2$ ), costs for organization and management ( $BV_3$ ) of laying in, manufacturing and sale of forest enterprise product of  $j$ -th type during the period  $t$ .

Let in manufacturing of a unit of forest enterprise product of  $j$ -th type during the period  $t$  be used  $L$  – types of technological operations;  $t_{il}$  – technological labor intensity of  $l$ -th operation for manufacturing a unit of forest enterprise product of  $j$ -th type during the period  $t$ ;  $t_{il}$  – index of recalculation of time allowance for  $l$ -th operation ( $l = \overline{1, L}$ ) into cost of labor force for laying in, manufacturing and sale of a unit of forest enterprise product of  $i$ -th type during period  $t$ .

Let in  $l$ -th technical operation for manufacturing a unit of forest enterprise product of  $j$ -th type during the period  $t$  be used  $b_l$  – units of main equipment and  $c_{tl}$  – amount of running costs, running repairs, consumed power, fuel etc. and technical provision of developmental strategy of the forest enterprise for unit of used equipment during the period  $t$ . Then formula of determination of volume of expenses for labor payment will appear as follows:

$$BV_{1t} = \sum_{i=1}^N \sum_{l=1}^L t_{il} \cdot t_{li} \cdot x_{it} + \sum_{l=1}^L b_l \cdot c_{tl}. \quad (7)$$

Costs for coverage of wear of main capital, including items of mandatory costs for renovation of main capital active part spent during the period  $t$  is calculated by the formula:

$$BV_{2t} = \sum_{k=1}^K \gamma_{kt} \cdot \alpha_{kt}, \quad (8)$$

where  $\kappa$  – is index of structural division used by forest enterprise during the period  $t$  for laying in, manufacturing and sale of a unit of  $i$ -th type of product ( $k = \overline{1, K}$ );

$\alpha_{kt}$  – is index of basic cost of main capital active part used by  $\kappa$ -th division of forest enterprise during the period  $t$  for laying in, manufacturing and sale of a unit of  $i$ -th type of product;

$\gamma_{kt}$  – is amount of deductions for renovation of main capital active part during the period  $t$ .

For calculation of coefficient  $\gamma_{kt}$  the standard formula will be used:

$$\gamma_{kt} = \frac{E_H}{(1 + E_H)^t - 1}, \quad (9)$$

where  $t$  – is number of full years of capital functioning;

$E_H$  – is norm of reporting various time costs equal norm of efficiency of capital investments.

Costs for organization and management of forest enterprise production activity during the period  $t$  shall include items of shop, total enterprise and non-production costs. They shall be calculated with use of rate of overhead costs ( $\alpha_c$ ) from direct production costs  $BV_{1t}$  during the period  $t$ :

$$BV_{3t} = \alpha_c \cdot BV_{1t}. \quad (10)$$

Consequently, formula for calculation of production costs during the period  $t$  is as follows:

$$BV_t = (1 + \alpha_c) \cdot \left( \sum_{i=1}^N \sum_{l=1}^L t_{il} \cdot t_{li} \cdot x_{it} + \sum_{l=1}^L b_l \cdot c_{tl} + \sum_{k=1}^K \gamma_{tk} \alpha_{tk} \right). \quad (11)$$

Costs for development and preparation for manufacturing new types of products ( $IV_t$ ) during the period  $t$  can be written down in the following way:

$$IV_t = \theta \cdot \theta_1^{\alpha_1} \cdot S_{z_1}^{\alpha_2} \cdot S_{z_2}^{\alpha_3} \cdot Q^{\alpha_4} \cdot \theta_2^{\alpha_5} \cdot x_{it}^{\alpha_6}, \quad (12)$$

where  $\theta$  – is dependence index;

$\theta_1$  – is index of products unification;

$\theta_{z_1}$  – are costs for structural and technological peculiarities;

$\theta_{z_2}$  – are costs from accuracy class and group of constructional complexity;

$Q$  – is total quantity of products;

$\theta_2$  – is index of technological fitting of production activity.

Numerical values  $\alpha_1, \alpha_2, \dots, \alpha_6, \theta_1$  – shall be determined by every technological group of forest enterprise products by correlating costs:

$$IV_t = \sum_{i=1}^N S_{z_i} \cdot x_{ti}, \quad (13)$$

where  $S_{z_i} = 0$ , if the type of product has been already developed in production activity of forest enterprises.

Considering formulae (5), (11) and (13) the formula for determination of production costs ( $V_t$ ) for laying in, manufacturing and sale of a unit of forest enterprise product of  $i$ -th type during the period  $t$  shall appear as follows:

$$V_t = (1 + \alpha) \cdot \sum_{i=1}^T (1 + q) \cdot \sum_{i=1}^N \sum_{j=1}^J \overline{u_{ij}^*} \cdot m_{ijt} \cdot x_{it} + (1 + \alpha)(1 + \alpha_c) \cdot \sum_{i=1}^T \left( \sum_{i=1}^N \sum_{l=1}^L t_{il} \cdot t_{li} \cdot x_{it} + \sum_{l=1}^L b_l \cdot c_{il} \right) + \sum_{i=1}^T (1 + \alpha) \left( \sum_{k=1}^K \gamma_{tk} \cdot \alpha_{tk} + \sum_{i=1}^N S_{zi} \cdot x_{it} \right), \quad (14)$$

or in scalar for vector  $X = \{x_{it}\}$  of the following form:

$$V_t = (1 + \alpha) \cdot \sum_{i=1}^T \left( \sum_{i=1}^N q_i \cdot x_{it} + L \right), \quad (15)$$

where

$$q_i = (1 + q) \sum_{t=1}^T \sum_{i=1}^N \left( \sum_{j=1}^J \overline{u_{ij}^*} \cdot m_{ijt} + (1 + \alpha_c) \sum_{l=1}^L t_{tl} \cdot t_{li} + S_{zi} \right), \quad (16)$$

$$L = (1 + \alpha_c) \sum_{t=1}^T \left( \sum_{l=1}^L b_l \cdot c_{tl} + \sum_{k=1}^K \gamma_{tk} \cdot \alpha_{kt} \right). \quad (17)$$

Consequently, considering formulae (1), (2) and (15) – (17) the target function of the dynamic model of forest enterprise production flexibility, which promotes reaching maximum economic efficiency of the enterprise activity – getting of maximum revenue, shall appear as follows:

$$Z = \sum_{t=1}^T \left( \sum_{i=1}^N x_{it} (\overline{u_{it}^*} - (1 + \alpha) \cdot q_i) - L \right) \rightarrow \max, \quad (18)$$

where

$$q_i = (1 + q) \sum_{t=1}^T \sum_{i=1}^N \left( \sum_{j=1}^J \overline{u_{ij}^*} \cdot m_{ijt} + (1 + \alpha_c) \sum_{l=1}^L t_{tl} \cdot t_{li} + S_{zi} \right), \quad (19)$$

$$L = (1 + \alpha_c) \sum_{t=1}^T \left( \sum_{l=1}^L b_l \cdot c_{tl} + \sum_{k=1}^K \gamma_{tk} \cdot \alpha_{kt} \right). \quad (20)$$

**Conclusions as the Main Results of Research Work.** The formalized model of market of forest enterprises is a system of equations covering its main indices. For every market, the system can have various numbers of equations and indices, but in any case, it shall contain equations of volumes of revenue and costs for production activity of the forest enterprise.

#### Sources and Literature

1. Bezmenko L. K. Model of analysis of production activity of industrial enterprise / L. K. Bezmenko, I. O. Lynnyk // Economics and management in industry : materials of All-Ukrainian scientific and practical conference «Economics and management in industry» dedicated to 75-th anniversary of economics and management faculty of NMetAU (28–29 October, 2010). – Dnipropetrovsk, 2010. – P. 367–368.
2. Lypych L. G. Formation of strategy of innovative development of the enterprise on basis of forecasting automotive industry market conditions : monography / Liubov Grygorivna Lypych, Tamara Petrivna Radishchiuk. – Lutsk : Lesia Ukrainka Eastern European National University, 2013. – 224 p.
3. Volynets I. G. Model of realization of strategic production flexibility of enterprises of forestry / I. G. Volynets // Bulletin of the Sumy National Agrarian University. Series «Economics and Management». – 2016. – № 4 (68). – P. 126–131.

#### References

1. Bezmenko, L. K., Lynnyk, I. O. (2010). Model analyzy vyrobnychoi diyal'nosti promyslovogo pidpryemstva [Model of analysis of production activity of industrial enterprise]. Economics and management in industry : Vseukrains'ka naukopraktychna konferentsiia (28–29 govtnya 2010 roku) – All-Ukrainian scientific and practical conference (pp. 367–368). Dnipropetrovs'k [in Ukrainian].

2. Lypych, L. G., & Radishchiuk, T. P. (2013). Formuvannya strategii innovaciynogo rozvytku pidpryemstva na zasadah prognozuvannya kon'yunktury rynku avtomobilebuduvannya [Formation of strategy of innovative development of the enterprise on basis of forecasting automotive industry market conditions]. Lutsk: Shidnoevropeys'kyi nacional'nyy universytet imeni Lesya Ukrainka [in Ukrainian].
3. Volynets, I. G. (2016). Model realizacii strategichnoi vyrobnychoi gnuchkosti pidpryemstv lisovogo gospodarstva [Model of realization of strategic production flexibility of enterprises of forestry]. Visnyk Sums'kogo nacional'nogo agrarnogo universytetu. Seriya 'Economica i menedzhment'. – Bulletin of the Sumy National Agrarian University. Series «Economics and Management», 4 (68), 126–131 [in Ukrainian].

**Анна Мохнюк, Ірина Волинець. Модель функціонування ринку підприємств лісового господарства в умовах інноваційного розвитку.** У статті визначено, що ефективну діяльність підприємств лісового господарства на ринку в його мінливих умовах та оптимальне використання лісових ресурсів можна змоделювати виробничою динамічною лінійною задачею оптимального планування. Доведено, що важливим елементом динамічної моделі розвитку ринку підприємств лісового господарства є система обмежень, яка в кожний момент часу залежить від ситуації на ринку, величини лісових ресурсів і наявності різнопланових можливостей їх використання.

**Ключові слова:** модель, підприємства лісового господарства, виробничі витрати, інноваційний розвиток.

**Анна Мохнюк, Ірина Волинець. Модель функціонування ринку підприємств лісового господарства в умовах інноваційного розвитку.** В статье определяется, что эффективную деятельность предприятий лесного хозяйства на рынке в его меняющихся условиях и оптимальное использование лесных ресурсов можно смоделировать производственной динамической линейной задачей оптимального планирования. Доказано, что важным элементом динамической модели развития рынка предприятий лесного хозяйства является система ограничений, которая в каждый момент времени зависит от ситуации на рынке, величины лесных ресурсов и наличия разноплановых возможностей их использования.

**Ключевые слова:** модель, предприятия лесного хозяйства, производственные затраты, инновационное развитие.

The article acted to the editorial board  
in 04.10.2017 p.

УДК 65.050.9

**Лариса Черчик** – доктор економічних наук, професор, завідувач кафедри менеджменту Східноєвропейського національного університету імені Лесі України

## Управління кадровою безпекою в системі менеджменту персоналу підприємства

У статті проаналізовано підходи до визначення та уточнено сутність кадрової безпеки, обґрунтовано місце й роль управління кадровою безпекою в системі менеджменту персоналу. Управління кадровою безпекою підприємства розглянуто як складову частину менеджменту персоналу, націлену на виявлення, знешкодження та попередження ризиків і загроз, які можуть бути спричинені персоналом та призвести до негативних наслідків для підприємства, а водночас передбачають захист працівників, створення сприятливих умов для роботи, забезпечення потреб і реалізацію цілей розвитку персоналу. Ефективність управління кадровою безпекою забезпечується завдяки врахуванню всіх аспектів та функціональних напрямів менеджменту персоналу й імплементацією в їхню структуру інструментів забезпечення кадрової безпеки.

**Ключові слова:** менеджмент персоналу, кадрова безпека, управління кадровою безпекою, функціональні складники управління кадровою безпекою.

**Постановка наукової проблеми та її значення.** Персонал – рушійна сила, яка, з одного боку, забезпечує ефективність діяльності підприємства, його конкурентоспроможність, із другого – це один із носіїв ризиків, причина як позитивних, так і негативних змін, процесів і результатів діяльності підприємства. Тому керівництво сучасних підприємств приділяє особливу увагу формуванню ефективного менеджменту персоналу.

Разом зі зростанням ролі персоналу як основного чинника та носія інтелектуального капіталу із завданнями менеджменту персоналу підприємства тісно корелює управління кадровою безпекою. Це