MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE

SIMON KUZNETS KHARKIV NATIONAL UNIVERSITY OF ECONOMICS

RISK MANAGEMENT

Practicum

**for Master's (second) degree higher education applicants
of speciality 073 "Management",
educational program "Business Administration"**

**Kharkiv
S. Kuznets KhNUE
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Practical situations, most typical of modern organizations, and exercises are proposed to help students apply the gained theoretical knowledge and skills to practice and form professional and general competences in risk management.
For Master's (second) degree higher education applicants of speciality 073 "Management", educational program "Business Administration".

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Introduction

The process of making a management decision at every enterprise takes place in conditions of uncertainty. Taking into account risk factors in the activities of economic entities allows them to obtain a certain effect for minimal possible losses during the implementation of economic operations, implementation of investment projects, investment development, etc. In addition, the study of the risk characteristic of the activity of a particular enterprise can help to reduce unforeseen or randomly arising costs associated with the choice of one of the possible alternatives in the process of making a management decision by a manager at any level of management.

Risk-specific business analysis can help reduce the unforeseen or incidental costs associated with choosing one of the possible alternatives when making management decisions at any level of management. Taking into account the activity of economic entities of risk factors allows them to get some effect at the least possible losses in the implementation of financial and economic operations, the implementation of innovation and investment projects, the implementation of investment developments, etc. Today requires the creation of a risk management system at the enterprise.

The purpose of the academic discipline is the formation of a system of professional competences (knowledge and practical skills) with the use of theoretical bases, methodological recommendations and practical skills for risk management.

The task of risk research consists in the study and analysis of existing approaches to the identification and assessment of risks; developing measures to reduce the impact of risks on the overall performance of a specific enterprise and improving the effectiveness of management decision making by managers at different levels of management.

Solving practical tasks will allow students to develop practical skills in managing economic risks of economic entities, substantiating methods of risk resolution. Students will learn to identify key risks, justify management decisions based on quantitative and qualitative assessment of economic risk. Students will be able to present the results of the development of the company's risk management strategy and tactics.

Content module 1. Theoretical basis of risk management

Theme 1. Enterprise risk management

Guidelines for doing the tasks

Evaluation of a risk situation

1. Calculation of the probability of occurrence of an event:

$$F = \frac{N^1}{N^2}, \qquad (1)$$

where N^1 is the number of occurrences of a particular event;
   N^2 is the number of cases in the statistical sample.

2. Calculation of the average expected value (meaning) of the event:

$$M = \sum_{i=1}^{n} R \times F, \qquad (2)$$

where R is the actual value (meaning) of the event.

3. Calculation of the variance of the event:

$$v = \sum F \times (R - M)^2. \qquad (3)$$

4. Calculation of standard deviation of a random variable from its mathematical expectation:

$$\sigma = \sqrt{v}. \qquad (4)$$

This indicator determines the degree of risk. That is, the higher the value of the standard deviation, the higher the degree of risk.

Standard deviation provides an estimate of the absolute variation. Therefore, it is not possible to compare the standard deviations of grades with different values of the average score. To be able to compare them, you need

to calculate the percentage ratio of the standard deviation to the arithmetic mean (average expected value).

5. Calculation of expected fluctuations of the expected result:

$$V = \frac{\sigma}{M}. \qquad (5)$$

6. Calculation of the expected result:

$$R_{exp} = M \pm V. \qquad (6)$$

This indicator will be in the range of the average expected meaning plus (minus) standard deviation.

7. Carry out an analysis based on the values of mathematical expectation, standard deviation and variation.

8. The decision making process.

Practical tasks

Task 1

Calculate the average expected value, variance, standard deviation and expected fluctuations in order to determine the level of economic profitability in the planning year (2024). All information is presented in Table 1.

Table 1

Economic profitability for 2012 – 2023 years, %

Ratio	Years											
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Economic profitability, %	6	12	7	16	16	4	13	15	15	8	12	20

Forecast economic profitability in 2024.

Solution of task 1

The results of the calculation of the average expected value and variance are presented in Table 2.

Table 2

The results of calculations

Meaning (R_i)	Probability (F_i)	Average expected meaning (K) ($\sum k_i$)	R – K	Variance (V) $(R_i – K)^2 \times F_i$
7	0.1	$7 \times 0.1 = 0.7$	$7 – 12.6 = –5.6$	$–5.6^2 \times 0.1 = 3.1$
16	0.2	$16 \times 0.2 = 3.2$	$16 – 12.6 = 3.4$	$3.4^2 \times 0.2 = 2.3$
4	0.1	$4 \times 0.1 = 0.4$	$4 – 12.6 = –8.6$	$–8.6^2 \times 0.1 = 7.4$
13	0.1	$13 \times 0.1 = 1.3$	$13 – 12.6 = 0.4$	$0.4^2 \times 0.1 = 0.01$
15	0.2	$15 \times 0.2 = 3.0$	$15 – 12.6 = 2.4$	$2.4^2 \times 0.2 = 1.2$
8	0.1	$8 \times 0.1 = 0.8$	$8 – 12.6 = –4.6$	$–4.6^2 \times 0.1 = 2.1$
12	0.1	$12 \times 0.1 = 1.2$	$12 – 12.6 = –0.6$	$–0.6^2 \times 0.1 = 0.03$
20	0.1	$20 \times 0.1 = 2.0$	$20 – 12.6 = 7.4$	$7.4^2 \times 0.1 = 5.5$
Total	–	$K = \sum k_i = 12.6$	–	21.64

Standard deviation is equal to the square root of variance (21.64) and makes 4.65.

The level of economic profitability in the planning year (2024) is expected to be in the range of the average expected meaning plus (minus) standard deviation ($R_{exp} = 12.6 \pm 4.65$).

Task 2

Calculate the average expected value, variance, standard deviation and expected fluctuations in order to determine the level of economic profitability in the planning year (2024). All information is presented in Table 3.

Table 3

Economic profitability for 2014 – 2023 years, %

Ratio	Years									
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Economic profitability, %	7	16	16	4	13	15	15	8	12	20

Forecast economic profitability in 2024.

Task 3

Calculate the average expected value, variance, standard deviation and expected fluctuations in order to determine the level of productivity in the planning year (2024). All information is presented in Table 4.

Table 4

Productivity for 2016 – 2023 years, %

Ratio	Years							
	2016	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**
Productivity, thousand UAH/person	29	29	40	38	37	41	32	35

Forecast productivity in 2024.

For calculations, you have to use Excel.

Task 4

An enterprise has a possibility of choosing the production and sale of two sets of goods in great demand with the same expected income of 150 million dollars. According to the marketing department, the income from the production and sale of the first set of goods depends on the probability of a specific economic situation. There are two equally probable incomes: 200 million dollars in case of successful sale of the first set of goods and 100 million dollars if the implementation is less successful. The income from the sale of the second set of goods with a probability of 0.9 is assumed to be 151 million dollars, and with a probability of 0.1 it is 51 million dollars. Evaluate the risk and decide whether to release both sets of products.

Task 5

A firm is deciding on the feasibility of its work in a certain market, using the following information from its analysts:

1) the potential annual market capacity is 1 million units of production;

2) there are also three firms of a similar profile working on the market, which control 80 % of its potential capacity;

3) the selling price of a product unit at the moment is 75 UAH;

4) the firm can take a share of this market thanks to a 10 % reduction in the selling price of products;

5) the possible degree of risk during work on this market is characterized by the occurrence of the following situations: the deviation of the actual price from the expected one can be:

a) + 5 %;

b) −10 %.

It is necessary to determine the degree of the price risk and its impact on the company's performance.

Task 6

For implementation a certain investment project, a company needs to make a one-time investment of 100 000 monetary units. Given the changes taking place in the market where the company operates, four possible situations may occur:

the first situation: the company can get a profit on the invested capital in the amount of 40 %;

the second situation: the profit will be 10 %;

the third situation: the profit will be 10 %;

the fourth situation: losses in the amount of 20 % of the invested option.

The chances for the implementation of each of the situations are the same.

Calculate the riskiness of implementing this project (the risk factor).

Task 7

A company is offered two risky projects (Table 5).

Table 5

The output data

Indexes	Project 1			Project 2		
The probability of the event	0.2	0.6	0.2	0.4	0.2	0.4
Income, thousand UAH	40	50	60	0	50	100

Considering that the company has fixed payments on debts in the amount of −80 000 UAH, which project should the company choose and why?

Task 8

Evaluate the risk of investing money in the activities in order to choose the activity with the lowest risk.

Activity 1: 20 cases of profit were observed.

Profit (from the money initially invested) of 20 % was observed 7 times, 25 % – 6 times, 15 % – 3 times, 12 % – 4 times.

Activity 2: 22 cases of profit were observed.

Profit of 20 % was made 5 times, 25 % – 5 times, 15 % – 5 times, 7 % – 3 times, 10 % – 4 times.

Task 9

It is assumed that the share price is 50 UAH, the standard deviation is 2 UAH.

Determine the probability that the share price:

a) will exceed 48 UAH;

b) will not exceed UAH 53.

Task 10

A machine packs tea into packs. It is known that the weight of a pack of tea is 100 g. The standard deviation is 1.5 g.

Determine the probability that the weight of a randomly selected pack of tea will be in the range of 99 – 102 g.

Task 11

A limited liability company must assess the risk of payment during buying goods on time before signing an agreement for the supply of products. There are statistical data on the work with three of its regular partners over the previous 10 months (Table 6).

Table 6

The term of payment of invoices by the partner (customer)

Number of month	1	2	3	4	5	6	7	8	9	10
Firm A	70	39	58	75	80	120	70	42	50	80
Firm B	50	63	32	89	61	45	31	51	55	50
Firm C	60	70	30	10	30	60	70	40	70	60

Choose a partner, with whom work will be less risky. The management of the company believes that the data is sufficient to choose a reliable partner.

Task 12

A commercial firm that deals with the delivery of products needs to assess a particular risk. The risk is that the transport agency that delivers the goods will deliver them on time. The firm has statistical data on working with three transport agencies for the year (Table 7).

Table 7

Delayed delivery time, hours

Month		1	2	3	4	5	6	7	8	9	10	11	12
Delayed time	Agency 1	48	0	42	72	0	24	0	36	56	20	96	12
	Agency 2	24	30	30	48	24	75	60	54	48	17	66	24
	Agency 3	84	12	30	66	54	18	36	24	56	8	84	42

Choose the most reliable partner.

Task 13

A company is planning to develop economic activity, which is possible according to six strategies. Foreign economic conditions that will affect the performance indicators of each strategy have certain probability of occurrence. Winnings for the implementation of each strategy and the probability of occurrence of conditions are given in Table 8.

Table 8

Winnings for the implementation of each strategy

S	1	2	3	4	5
S_1	18	4	23	9	3
S_2	12	21	15	33	47
S_3	36	6	4	40	3
S_4	15	14	10	30	5
S_5	42	27	17	42	40
S_6	8	9	37	7	12
P_j	**0.66**	**0.13**	**0.02**	**0.09**	**0.1**

Determine the average effectiveness of each strategy; give a quantitative assessment of the riskiness of each strategy based on the variation indicators: variance, standard deviation, coefficient of variation; analyze all the quantitative characteristics of the effectiveness and riskiness of decisions and draw a conclusion.

Theme 2. Assessment of economic risks

Guidelines for doing the tasks

Selection of decisions using a decision tree (positional games)

A decision tree is a graphic representation of a sequence of decisions and environment states, indicating the corresponding probabilities and payoffs for any combination of alternatives and environment states.

For each alternative, it is necessary to calculate the average expected result (AER) as the sum of the products of the size of the winnings and the probabilities of these winnings.

AER is equal to the mathematical expectation of the random variable X – the value of the winnings.

If x_1, x_2, ..., x_n are the possible values of the random variable x, and F_1, F_2, ..., F_n are the probabilities with which the random variable x takes possible values, then AER can be found by the formula:

$$AER = \sum_{i=1}^{n} x_i F_i. \tag{7}$$

The process of decision making using a decision tree is carried out in five stages:

Stage 1. Formulation of the task.

First of all, it is necessary to discard all the factors that do not relate to the problem, and among the multitude of those that remain, distinguish the essential and non-essential ones. This will make it possible to bring the description of the task of making a management decision into a form that can be analyzed. The following basic procedures must be performed:

determination of information gathering opportunities for experimentation and real actions;

compiling a list of events that may occur with a certain probability;

establishing the temporal order of placing events, the consequences of which contain useful and accessible information, and those sequential actions that can be initiated.

Stage 2. Building a decision tree.

Stage 3. Estimating the probabilities of environmental states, i.e. comparing the chances of occurrence of each specific event. It should be noted that the indicated probabilities are determined either on the basis of available statistics or by expert means.

Stage 4. Establishing gains (or losses, as gains with a minus sign) for each possible combination of alternatives (actions) and environmental states.

Stage 5. Solving the task and making a decision.

Application of the decision tree method makes it possible:

to determine the ways to achieve the goal by performing a quantitative assessment of the complexity of the tasks that arise, and assessing the difficulties of implementing this or that option;

to improve the quality of decisions in conditions of uncertainty.

Practical tasks

Task 1

An oil company is going to drill a well. It is known that if the company drills:

with a probability 0.6 oil will not be found;

with a probability of 0.1 reserves amount to 50 000 tons;

with a probability of 0.15 they are 100 000 tons;

with a probability of 0.1 the field capacity is 500 000 tons;

with a probability of 0.05 it is 1 million tons.

Expected results:

if oil is not found, the firm will lose 50 000 dollars;

if the field capacity is 50 000 tons, the loss will be reduced to 20 000 dollars;

if the field capacity is 100 000 tones, the profit will be 30 000 dollars;
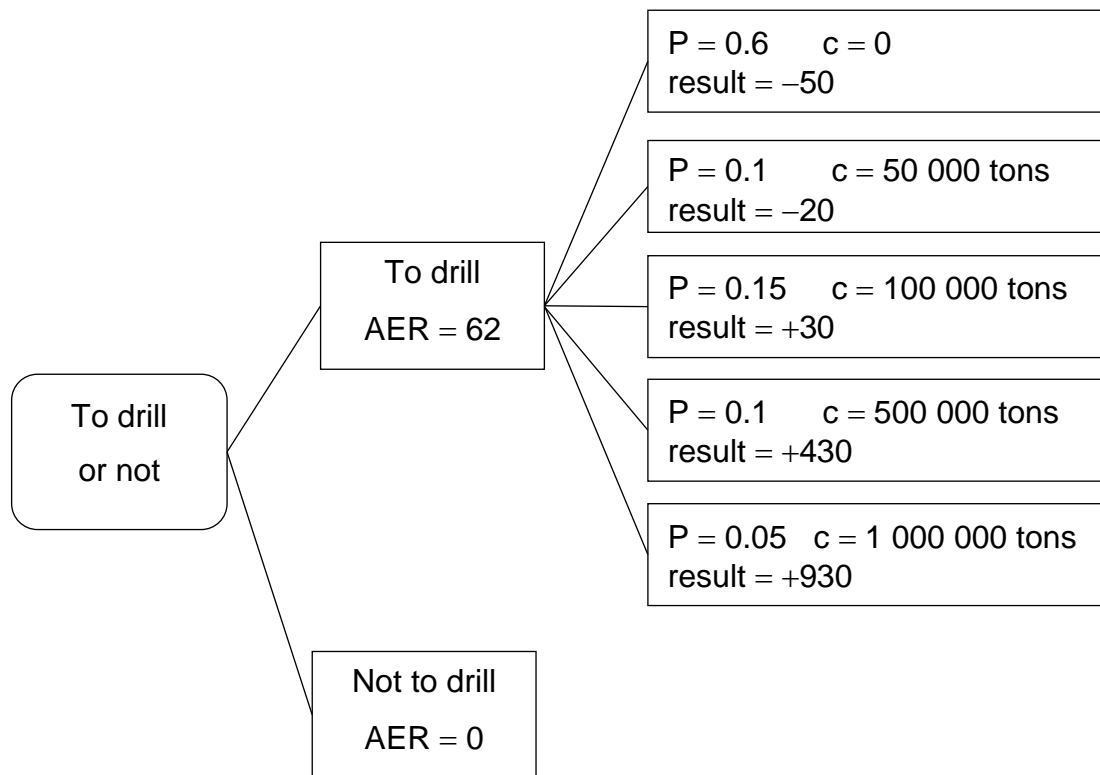
if the field capacity is 500 000 tones, the profit will be 430 000 dollars;

if the field capacity is 1 000 000 tones, the profit will be 930 000 dollars.

What will the company do in this case?

Solution of task 1

$$AER = 0.6 \times (-50) + 0.1 \times (-20) + 0.15 \times 30 + 0.1 \times 430 + 0.05 \times 930 = 62.$$

| | | P = 0.6   c = 0
result = −50 |
| P = 0.1   c = 50 000 tons
result = −20 |
| To drill
AER = 62 | P = 0.15   c = 100 000 tons
result = +30 |
| P = 0.1   c = 500 000 tons
result = +430 |
| P = 0.05   c = 1 000 000 tons
result = +930 |

To drill or not

Not to drill
AER = 0

A decision tree

Tasks 2 – 3

The management of a company is considering whether to create large-scale production of a new product, a small business, or to sell the patent to another firm. The payout, which the company can receive, depends on favorable or unfavorable market conditions (Table 9).

Table 9

Possible actions

No.	Strategy	Result	
		Optimistic scenario	**Pessimistic scenario**
1	Large-scale production	200 000	−180 000
2	Small business	100 000	−20 000
3	Selling the patent	10 000	10 000

The probability of favorable and unfavorable economic environment is 0.5 (task 2) (0.7 (task 3)).

Task 4

An enterprise has the opportunity to choose the production and sales of two sets of consumer goods with the same expected income of 150 million dollars. According to the marketing department, the income from the production and sale of the first set of goods depends on the likelihood of a particular economic situation.

There are two equally probable revenues:

200 million dollars in case of a successful sale of the first set of goods;

100 million dollars if the implementation is less successful.

The revenue from the sale of the second set of goods with a probability of 0.9 is assumed to be 151 million dollars, and with a probability of 0.1 it is 51 million dollars.

Assess the risk and decide on the release of both sets of goods.

Task 5

A firm, which produces printed products, conducted market analysis. The firm assesses the possibility of favorable and unfavorable consequences equally. Market research, which can be done by an expert, costs 18 thousand UAH. The expert believes that with a probability of 0.45 the market will be favorable under favorable conditions. At the same time, a negative result under favorable conditions is expected only with a probability of 0.55. Under adverse conditions with a probability of 0.3 the market can also be favorable. If a large batch of printed matter is produced, then under a favorable market the profit will be 260 thousand UAH, and under unfavorable conditions the firm bears losses in the amount of 145 thousand UAH. A small batch in case of its successful implementation will bring the company 85 thousand UAH of profit and 45 thousand UAH of losses under unfavorable external conditions. Build a decision tree and define:

1) the best solution (without additional market survey), using the criterion of maximizing the expected result;

2) the best solution with an additional market survey, using the criterion of maximizing the expected result;

3) expediency of ordering a marketing survey.

Task 6

A company receives products from two suppliers A and B. The quality of the products is given in Table 10.

Table 10

Quality of products

Defect, %	Probability of manufacturers	
	A	B
1	0.5	0.3
2	0.2	0.3
3	0.15	0.2
4	0.1	0.1
5	0.05	0.1

Total losses for eliminating the defect of one unit of product is 100 UAH. Products are delivered in batches of 10 000 units. Since the quality of the products of the supplier B is worse, this supplier sells the whole batch 1 000 UAH cheaper.

Build a decision tree and, based on it, draw a conclusion regarding the choice of the optimal supplier for the company.

Theme 3. Methods of managing economic risks

Guidelines for doing the tasks

Playing with nature (a payment matrix)

Let player A have m strategies (A_1, A_2,..., A_m), and player B n strategies (B_1, B_2,..., B_n).

As a result of the application of strategy A_i by player A and strategy B_j by player B, the result of the game is unambiguously determined – it is the amount that player A wins and player B loses.

The game is considered given all the values of aij are known, which are recorded in the form of a matrix, which is called the payment matrix, and which is presented in Table 11. This is a matrix game that has dimension mxn.

Table 11

The payment matrix of the game *mxn*

Player	B₁	B₂	...	Bₙ
A₁	a₁₁	a₁₂	...	a₁ₙ
A₂	a₂₁	a₂₂	...	a₂ₙ
...	...	...	...	
Aₘ	aₘ₁	aₘ₁	...	aₘₙ

Rows in Table 11 correspond to player A's strategies, and columns correspond to player B's ones.

To make decisions in conditions of uncertainty, it is necessary to do the following:

1. Build a payment matrix.

2. Determine the average expected value of the event.

3. Determine the standard root mean square deviation of a random variable from its mathematical expectation.

4. If necessary, determine the variability.

5. Make a decision.

Practical tasks

Task 1

Consider the problem of purchasing coal to heat the house in winter. You have the following data (Table 12).

Table 12

Prospective winter conditions

Type of winter	Volume of coal	Price for coal per ton, UAH (winter price)
Warm	4	7
Normal	5	7.5
Cold	6	8

The probability of winter type is 0.35 to be warm; 0.5 to be normal; 0.15 to be cold.

The summer price of coal is 6 UAH per ton.

How many tons of coal are you planning to purchase in the summer for the winter?

Solution of task 1

An example of filling out the payment matrix is presented in Table 13.

Table 13

The payment matrix

Plan/Fact	Warm (p = 0.35)	Normal (p = 0.5)	Cold (p = 0.15)	AER
Warm (4 t)	4 × 6 = 24	4 × 6 + 1 × 7.5 = = 31.5	4 × 6 + 2 × 8 = = 40	24 × 0.35 + 31.5 × 0.5 + 40 × 0.15 = 8.4 + + 15.75 + 6 = 30.15
Normal (5 t)	5 × 6 = 30	5 × 6 = 30	5 × 6 + 1 × 8 = = 38	30 × 0.35 + 30 × 0.5 + 38 × 0.15 = 10.5 + + 15 + 5.7 = 31.2
Cold (6 t)	6 × 6 = 36	6 × 6 = 36	6 × 6 = 36	36 × 0.35 + 36 × 0.5 + 36 × 0.15 = 36

Variance:

warm winter:

$(24 - 30.15) \times 2 \times 0.35 + (31.5 - 30.15) \times 2 \times 0{,}5 + (40 - 30.15) \times 2 \times 0.15 = 28.70$;

normal winter:

$(30 - 31.2) \times 2 \times 0.35 + (30 - 31.2) \times 2 \times 0.5 + (38 - 31.2) \times 2 \times 0.15 = = 8.16$;

cold winter: 0.

Standard deviation:

warm winter: 5.357;

normal winter: 2.857;

cold winter: 0.

Costs are expected in the range:

for warm winter: 30.15 ± 5.357 (minimum is 24.79 UAH and maximum is 35.507 UAH);

for normal winter: 31.2 ± 2.857 (minimum is 28.343 UAH and maximum is 34.057 UAH);

for cold winter: 36.0 ± 0 (minimum is 36 UAH and maximum is 36 UAH).

Optimal number is 5 tons.

Task 2

The company "Ukrainian Cheese" is a small manufacturer of various products made of cheese for export. One of the products is the cheese paste. The Director must decide how many boxes of cheese pasta should be made within a month. The probability that the demand for cheese pasta in a month will be 6, 7, 8 or 9 boxes, is, respectively: 0.1, 0.3, 0.5, 0.1. The cost of production of one box is 45 dollars. The company sells each box for a price of 95 dollars. If a box with the cheese paste is not sold in a month then it goes bad and the company has no income. How many boxes should be done in a month?

Task 3

An LTD "Photo and Color" is a small manufacturer of chemicals and photo equipment. One of the products of the company is BC-6. During a week, the company could sell 11, 12 or 13 boxes of BC-6. Profit from selling one box of BC-6 is 35 UAH. BC-6 has very short shelf life. Therefore, if the box is not sold by the end of the week, it should be destroyed. This action costs 56 UAH. Probabilities to sell 11, 12 or 13 boxes of BC-6 in a week are 0.45, 0.35 and 0.2 respectively. What should the company do?

Task 4

A bakery bakes different types of bread to sell. The cost of a loaf is 3.0 UAH. It is sold for 7.0 UAH. Additional data is presented in Table 14.

Table 14

Demand per day

Demand per day, units	10	12	14	16	18
Probability, %	10	20	30	30	10

If a loaf is made but not sold, additional losses are 2.0 UAH per unit. How much loafs should be baked?

It is necessary to construct a payment matrix of incomes and to determine how many units of bread are desirable to be purchased for sale using such criteria as an average expected meaning, variance, mean square deviation and the coefficient of variation.

Task 5

A store sells dairy products. The sales director of the store must determine how many cans of sour cream should be bought from the manufacturer for trading during a week.

The probability that the demand for sour cream during a week will be 7, 8, 9 or 10 cans is equal to 0.2; 0.2; 0.5; 0.1. The cost of buying one can of sour cream costs the store 280 UAH, and sold price of sour cream is 400 UAH for a can.

If the sour cream is not sold within a week, it will get spoiled and the store will suffer additional losses of 15 UAH for a can, which was purchased and supposed to be returned to the dairy factory.

It is necessary to construct a payment matrix of incomes and to determine how many cans of sour cream should be purchased for sale using such criteria as an average expected meaning, variance, mean square deviation and the coefficient of variation.

Theme 4. Economic risk management system

Guidelines for doing the tasks

Calculation of the efficiency of investment projects, including external influences

Determining the net present value (NPV) and the internal rate of return (IRR) of the investment project in the inflation environment is associated with significant difficulties.

The universal formula for calculating NPV of a project allows us to estimate this amount in case of unequal inflationary distortion of incomes and expenses. The formula allows simultaneous making inflationary correction of cash flows and discounting on the basis of the weighted average cost of capital, which includes an inflation premium:

$$NPV = \sum_{i=1}^{t} \frac{\left[R_t \prod_{r=1}^{t}(1+i_r) - C_t \prod_{r=1}^{t}\left(1+i_r^{'}\right)\right](1-T) + D_t \times T}{(1+k)^t} - J_0, \quad (8)$$

where R_t is nominal earnings of the t-year;

i_r is inflation of revenue of the r-year;

C_t is nominal monetary costs of the t-year;

$i_r^{'}$ is inflation costs of the r-year;

T is the income tax rate;

D_t is depreciation of the t-year;

J_0 is the initial cost of purchase of fixed and working capital;

k is the weighted average cost of capital, including the inflation premium.

The calculations must be done in the following order:

1. Determine the net present value (NPV) for the given formula and conclude the possibility of acceptance of the proposed projects:

if NPV > 0, then the project should be accepted;

NPV < 0, then the project should be rejected;

NPV = 0, the project is neither profitable nor unprofitable.

2. Determine the internal rate of return (IRR) by the graphic method.

2.1. Set a significantly higher discount rate than the base (3 – 4 bids) and calculate the NPV for each relevant bid. For example, if the base rate is 3.0, then it is necessary to take 4.0; 5,0; 6.0; 7.0 and so on. The calculations must be made until NPV changes the sign to the opposite (that is, it becomes unprofitable).

2.2. Construct a graph based on the NPV and the corresponding discount rate (the discount rate on the ordinate, NPV on the abscissa).

2.3. Connect the points so that the curve crosses the IRR axis. If necessary, extend this curve to the intersection of the axis. At the point of intersection of the graph with the IRR axis, the net real value (NPV = 0) of the project is zero.

The project can be accepted if IRR exceeds the base discount rate. The higher the margin of stability the better conditions for the investor.

3. Draw conclusions about the possibility of implementation of these investment projects.

Practical task

Based on the data of net investment projects determine the NPV and IRR (Tables 15 – 16).

The initial cost of the project is 7 mln UAH.

Annual depreciation is 1 mln UAH.

The lifetime of the project is 4 years.

The income tax rate is 25.0 %.

The weighted average cost of capital with inflation premium is 180 %.

Table 15

Revenues and expenses for the base period prices

Year	Cases			
	Revenues of the project, mln UAH		Expenses of the project, mln UAH	
	1	2	1	2
1	6.0	6.0	3.0	3.0
2	7.0	7.0	2.0	4.0
3	6.0	8.0	2.0	4.0
4	6.0	8.0	2.0	4.0

Table 16

The expected rate of inflation

Year	Cases			
	Revenues of the project, %		Expenses of the project, %	
	1	2	1	2
1	170	300	130	200
2	150	220	110	180
3	100	150	105	120
4	80	80	100	100

On the basis of the analysis of these indicators (NPV, IRR) draw a conclusion about the feasibility of the implementing the proposed project.

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Contents

НАВЧАЛЬНЕ ВИДАННЯ

РИЗИК-МЕНЕДЖМЕНТ

Практикум
для здобувачів вищої освіти спеціальності
073 "Менеджмент"
освітньої програми "Бізнес-адміністрування"
другого (магістерського) рівня
(англ. мовою)

Самостійне електронне текстове мережеве видання

Укладачі: **Близнюк** Тетяна Павлівна
Собакар Маргарита Вікторівна

Відповідальний за видання *Т. І. Лепейко*

Редактор *З. В. Зобова*

Коректор *З. В. Зобова*

Наведено практичні ситуації, характерні для сучасних організацій, і відповідні вправи, із метою застосування здобувачами вищої освіти на практиці здобутих теоретичних знань і досвіду та формування відповідних професійних і загальних компетентностей з управління ризиками.

Рекомендовано для здобувачів вищої освіти спеціальності 073 "Менеджмент" освітньої програми "Бізнес-адміністрування" другого (магістерського) рівня.