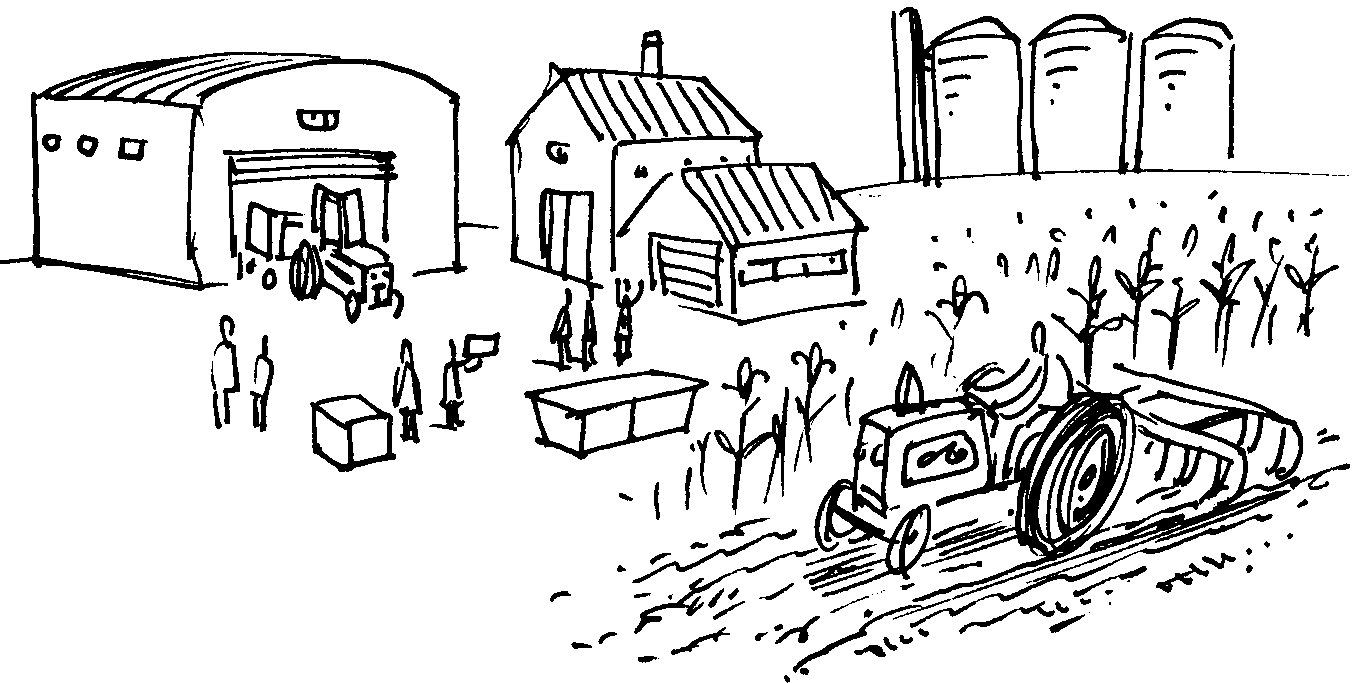


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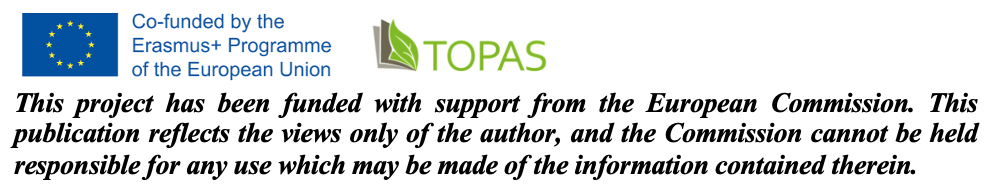


**PLANNING OF ENTERPRISES**

***Course-book***

***for English-speaking students***

**SUMY-2020**

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**MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE**

**SUMY NATIONAL AGRARIAN UNIVERSITY**

**Economics and Management Department**

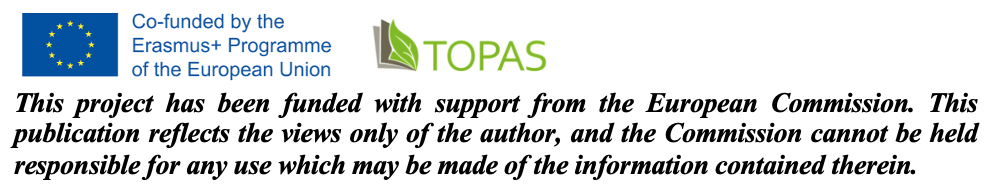
**PLANNING OF ENTERPRISES**

**Course-book**

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**of master’s degree of speciality 073 “Management”**, **training program “Administrative management”**

SUMY-2020

****

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# **Theme 1. Project essence**

*The aim of theme’s study is* to learn the basic principles and stages of planning

|  |  |
| --- | --- |
| Пов’язане зображення | **Plan.**  1. The marginal value principle.  2. An optimal costs’ level. |

**1. Marginal value principle**

The main task of enterprise’s planning is the formation of production organization that is adapted to the permanent change of external and internal market conditions. The main terms of enterprise’s planning such as planning process, decision making, analysis and control are defined in glossary more detail.

The aim of planning is to help agricultural enterprises to organize production process in a more effifient way. The aim of management is to achieve profit in long-term period.

It is important to take into account some limitations (work use, risk, traditions of management), additional to the goal of the profit maximization.

It is necessary to take into account some economic principles to make enterprise planning more effective. They are examined below.

**The Marginal value principle.** This principle makes possible to investigate the influence of different changes of production process organization into results (success) of enterprise functioning.

Concerning the marginal value principle, we assume that every factor could be bought in any quantity. But it is not so. Some production factors can’t be changed (substituted) in short term period (for example area, work, buildings). In this case, we must take into account opportunity costs, while analyzing above-mentioned production factors.

Opportunity costs arise up at expansion of certain production process with concurrent limitation of another.

It means that optimal production organization is chosen by minimal opportunity costs criterion.

A combination of marginal value and opportunity costs principles help us to make effective decision on enterprise planning.

Marginal value principle is used to make decision about closing of certain production process in favor of another to achieve the highest profit. In this case independent of volume of production costs are the most important, for example:

- costs that don’t arise up at zero production;

- fixed costs (disproportional).

For example: Growing of sugar beet is increased at the expense of potato growing. Reducing the potato growing leads to opportunity costs equal to marginal income size (lost income from potato sale).

Replacement of cultures will make sense if opportunity costs are lower than additional profit (positive marginal value, marginal income of sugar beet growing is higher than marginal income of potato growing). If production process of potato growing is restricted and special potato-harvesting machines are sold, so saved costs will be taken into account at marginal value estimation. Costs that arise up (saved costs) with the change of production organization are considered as “dependent of plan” costs. Costs that remain fixed with the change of production organization are named “independent of plan”.

Planning process is done in 2 stages, as usual:

1. Identification and choice of important production processes (by estimation of marginal income).
2. Maximization of total marginal income by combining the different production processes (determination of optimal production direction).

**2. Optimal costs’ level.**

There are some changes in organizing of enterprise functioning:

1. *Optimal costs level* (optimal intensity (ratio factor/product).

There are quantitative and cost ratio between products and production assets (factors), used in production. Within the agriculture production if the use of production assets (for example, fertilizers) increases, so the harvest (for example, grain crops) will increase too. But the increase of harvest per unit of production assets (marginal product) will be lower, if the use of production assets is the same.

The increase of costs will be expedient if received income (marginal income) covers additional costs (marginal costs).

1. *Optimal costs forming* (optimal factors combination (ratio factor/factor)

Production factors are used in production process commonly, as a rule. Only few of them are interchangeable (for example, production of 10l of milk could be reached with the use of different forage combinations). There is a law of marginal replacement norm where additional use of certain production factor is related with lower costs, instead of another production factor.

Optimal costs’ level depends on production factors prices also. The combination of production factors is optimal, when total costs become minimal.

1. *Optimal production direction* (Optimal production combination, ratio product/product)

Expansion of certain production process instead of another will make sense if additional profit (marginal profit) of enlarged production process covers minimal profit (marginal costs).

The combination of production processes of enterprise is seen optimal, if total marginal income (marginal profit also) will be the highest.

If all above-mentioned principles are performed (i.e., an optimal production organization is provided), it is possible to get the maximal profit. However, that is very difficult and even impossible in practice. So, the main task of production planning is to bring costs calculation closer to optimal size. It could be done by use of different methods of economic modelling, such as linear programming etc.

# **Practical class**

|  |  |  |
| --- | --- | --- |
| Результат пошуку зображень за запитом "practical class symbols" | *Student must know* the principles and theoretic bases of enterprise’s planning, the principles of marginal value assessment, *and be able* to apply the theoretic knowledge in practice | |
|  |  | |
| Результат пошуку зображень за запитом "question symbol" | | **Control questions:**   1. Explain the marginal value principle. 2. Explain the optimal costs’ level and optimal costs’ forming principles. 3. Explain the optimal production direction principle. 4. What are the prerequisites for the reaching of maximal profit?   **Questions for discussion:**  1. Explain the interrelation between marginal value principle and the opportunity costs principle. |

**Solve the tasks:**

**Task 1.** There is presented the dependence of “Afrodita Ltd” company total costs’ (TC) from output volume (Q) in table 1.1. Determine the variable costs (TVC), fixed costs (TFC), marginal costs (MC), average costs (AC), average variable costs (AVC), average fixed costs (AFC).

Table 1.1 – Initial data

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Q, pieces | 0 | 1 | 5 | 10 | 18 | 20 | 22 | 23 | 25 |
| TC, uah | 55 | 85 | 375 | 700 | 1500 | 1600 | 1770 | 1800 | 1950 |

**Task 2.** “Best Livestock Ltd” companyproduces concentrative forage for livestock industry. An information about output, price and production costs is presented in the table below. Identify and calculate the total costs (TC), variable costs (TVC), fixed costs (TFC), marginal income.

Table 1.2 – Production and economic indicators for Best Livestock Ltd.

|  |  |  |
| --- | --- | --- |
| Item | Value | |
| Productivity | 1000 | t of forage |
| Average price | 18 | uah / c |
| Raw materials | 8.5 | uah / c |
| Fuels for production | 2 | uah / c |
| Salary of production workers | 5 | uah / c |
| Depreciation expenses | 65 000 | uah |
| Salary of top managers | 48 880 | uah |
| Buildings and equipment maintenance | 3 000 | uah |

**Methodical recommendations for the solution:**

Total costs (TC) are calculated as follows:

, (1.1)

where TFC – time-fixed costs, uah; TVC – time-variable costs, uah.

Average costs (AC) are calculated as follows:

, (1.2)

where Q – volume of output, pieces.

Average fixed costs (AFC) and average variable costs (AVC) are calculated by the same principle as AC (see 1.2 formula).

Marginal costs (MC) are calculated as follows:

. (1.3)

It would be better to present results of task 2 solution in a table form.

## Theme 2. Production processes and plans scheduling

*The aim of theme’s study is* to investigate the main elements of enterprise’s plan and to study the bases of measures comparison at enterprises planning.

|  |  |
| --- | --- |
| Пов’язане зображення | **Plan.**   1. Optimal production direction 2. Production factors availability and other production limitations 3. Determination of production processes of enterprise-Fact |

**1. Optimal production direction**

It is necessary to compare different cases for assessment of enterprise development measures. It is recommended to use the next scheme of comparison: - estimation of enterprise’s parameters before and after measures implementation; - estimation of enterprise’s parameters with and without measures implementation. Posted below schemes illustrate different cases of enterprise development as with, so without measures implementation. If enterprise’s success is dependent on an improvement of production technology and investments, so it will be impossible to determine the influence of certain measurement (production improvement or investment) into total result. It would be better to plan these measures independently. There is recommended to plan production technology improvement firstly (Optimization of enterprise) and then plan the investments (Scheme 2). Planning process organization depends on chosen method of planning. However, each method includes important stages from data gathering to optimal plan determination. Some of them are presented below.

1. **Production factors availability and other production limitations.**

The land availability (used area). Land description and accounting include the type of area (arable land, meadows and pastures, forest), harvest potential and potential of cultivation (for example, typical for wheat growing area, different quality of meadows and pastures). It is necessary to point the terms and conditions of land use (rental relations, joint use, property rights) currently and for the future.

Labour availability is described by man.-hours and covers:

1. family labour. There is necessary to take into account the structure of family labour (for example, adult – 1 unit, junior – 0.7, workers of retirement age – 0.3) and work time of family members, which are not engaged in productive agricultural activity.
2. Employees. Family workers and employees differ by the source of wage payments. Family workers don’t receive salary, but profit, while employees receive salary and these costs are presented in enterprise’s reports.

Employees include partially used workers, full-time workers and seasonal workers.

The planning of employees presupposes an analysis of workers’ structure by qualification, salary, age, experience, etc.

Seasonal employees. Seasonal employees (temporary work force) is used for periods with the highest requirement of work. Salary of seasonal workers is hourly or piece-rate (for example, per 1 ha), as usual.

1. **Determination of production processes of enterprise-Fact**

Additional production processes are new and require investments. It is necessary to take into account, that investments affect different parameters of current production process (marginal income), such as: volume of production, variable costs, requirement of labour, etc.

For example, let’s look at different production processes for “Dairy production”:

Technology 1: Technology of Dairy production process at enterprise-fact;

Technology 2: Improved technology of Dairy production process with available resources (farm buildings) without reconstruction;

Technology 3: Improved technology of Dairy production process with available resources (farm buildings) with reconstruction;

Technology 4: Improved technology of Dairy production process with construction of new farm buildings.

There is the need to make an aggregation of feed crop and cattle breeding production to make decision on technology implementation. An aggregation should take into account additional costs and could be performed with program planning II method.

t

Efficiency

- Efficiency with measures

- Efficiency without measures

+

= General efficiency with measures

t

Efficiency

- Efficiency with measures

- Efficiency without measures

+

= General efficiency with measures

Scheme 2.1 - Enterprise development with or without measures implementation

t

Efficiency

- Efficiency without measures

- Efficiency with investments

3

1

2

4

1

- Efficiency with optimization

- Efficiency with investments and optimization

2

3

4

Scheme 2.2 - Comparison of influence of different measures on the efficiency

Description of all possible production processes include calculation and presentation of marginal incomes, costs, requirement of production assets, etc. It is advisable to present information for enterprise planning at table form. It is necessary to calculate marginal income per unit of land (ha), labour (man-hours), cattle-place, used capital (100 uah).

# **Practical class**

|  |  |  |
| --- | --- | --- |
| Результат пошуку зображень за запитом "practical class symbols" | *Student must know* the principles and theoretic bases of enterprise’s planning, the principles of marginal value assessment *and be able* to identify and describe production process and their characteristics, as well as to calculate the appropriate values (costs and income). | |
|  |  | |
| Результат пошуку зображень за запитом "question symbol" | | **Control questions:**   1. What are the main stages of planning process? 2. What is the optimal production organization? 3. Explain the use of the minimal opportunity costs criterion.   **Questions for discussion:**   1. What is the way to ensure the optimal production organization? 2. Explain the role of disproportional costs assessment in decision-making within the enterprise’s planning? Give the examples. |

**Solve the tasks:**

**Task 1.** Prepare an operating budget (output and costs plan) for sugar beet production (“Afrodita Ltd” company), with the use of the data presented in table below. Express results in the table form.

Table 2.1 – Production and economic indicators for Afrodita Ltd.

|  |  |
| --- | --- |
| Item | Value |
| Land area, ha | 1015 |
| Productivity, c/ha: |  |
| Sugar beet | 28 |
| Tops, % of main product | 50 |
| Bonus, uah/ha | 150 |
| Production assets requirements, kg/ha: |  |
| Seed, kg/ha | 28 |
| Fertilizers (beet/tops), kg/c: |  |
| N | 0.18/0.35 |
| P | 0.09/0.11 |
| K | 0.29/0.59 |
| Labour, man-hour. /ha: |  |
| Own | 5 |
| Employed | 7 |
| Plant protection costs, uah/ha | 160 |
| Variable costs of own mechanization, uah/ha | 245 |
| Lease area costs, uah/ha | 400 |
| Indirect costs, uah/ha | 50 |
| Buildings value\*, uah | 1 000 050 |
| Equipment value\*\*, uah | 1 523 156 |
| Housing and utilities services (electricity, heating and water-supply for administrative and farm buildings), uah | 50 000 |
| Water supply (spraying) for production aims, uah/ha | 80 |
| Administrative labor costs, uah | 80 000 |
| Transportation costs, uah/c | 5 |
| Sale costs (advertising, transaction etc), uah/c | 0.87 |
| Storage costs, uah/c | 0.56 |
| Price, uah/kg: |  |
| Sugar beet | 12 |
| Tops | 1.8 |
| Seed | 70 |
| Fertilizers: |  |
| N | 1.1 |
| P | 1.3 |
| K | 0.5 |
| Salary, uah/man-hour. | 15 |
| Opportunity costs for work, uah/man-hour. | 20 |
| Salary extra charges (social measures expenses), % of salary (or opportunity costs) | 21 |

\* duration of buildings use is 20 years. The analysed period is the first. Use the linear method of amortization.; \*\* equipment and machines are used for 5 years in average. The analysed period is the first. Use the linear method of amortization.

## Theme 3. Data sources for planning

*The aim of theme’s study is* to investigate the main data sources for enterprise planning

|  |  |
| --- | --- |
| Пов’язане зображення | **Plan.**  1. Enterprise’s description.  2. Initial data  3. Secondary information |

**1. Enterprise’s description.**

The description of current situation is the first stage of planning. It covers the description of such parameters, namely:

- economic conditions (nature conditions, market, socio-economic conditions);

- production factors availability (land, labour, capital etc.);

- main production restrictions;

- description of current production processes of enterprise-fact;

- calculation of financial results of enterprise-fact.

**General information:**

1. Legal and organizational data (geographical and political status / placement, legal status, enterprise system, single and household value);
2. Climate and land conditions (above sea level position, rainfall, annual average temperature, main soil type, landscape’s structure, soil quality, etc.);
3. Infrastructure and market relations:

- internal infrastructure (structure, quantity and sizes of lands, road conditions);

- external infrastructure (distance to cities, storages, markets, transportation ability);

- market relations (production assets availability, demand and supply relations, goods and production assets prices);

d) socio-economic conditions are important especially for family enterprises (family traditions of functions’ distribution, financing, debts, types of behavior, employees use, etc.)

**Enterprise description.** It is necessary to take into account initial parameters of enterprise, such as:

1. General information: organizational data and legal status; climate and area features, market conditions and infrastructure development; social-economic relations.
2. Availability of production factors and other production limitations:

land (availability, quality, rent relations, use limitations);

labour (family labour, permanent employees, seasonal employees, etc.);

assets and capital (structure of assets and capital, fixed costs, percentages, etc.);

other production limitations (crop rotations, political and legal relations, availability of loan capital).

3) Description of production processes for Enterprise-Fact.

To describe each production process of the Enterprise-Fact you should use the marginal income calculation, as well as information about production assets’ requirements (including the requirement of production equipment and machines). The most important information about production assets requirements covers the following issues: labor needs (for each work period), capital needs for animals and current assets, demand and supply of basic forage (for each feeding period), storage capacity and needs, cattle-places needs, etc.

4) Calculation of production indices for Enterprise-Fact:

1. A combination of production process (enterprise-fact). The main indices of production processes (certain marginal incomes) should be calculated firstly. The most important size is total marginal income. It is the sum of certain marginal incomes multiplied on output of related production process of enterprise-fact (total requirements for labor and capital are calculated in the same way).
2. Efficiency indices calculation (enterprise-fact). Efficiency indices are calculated with the use of the total marginal income of enterprise-fact. Total marginal income should cover fixed costs.

Total marginal income reduced on sum of fixed costs represents the profit. The profit is the basis for other efficiency indices’ calculation.

**2. Initial data**

Data sources for planning, decision making, and control are classified by their origin as follows:

**Initial data:** independently gathered data;

**Secondary data**: processed data (for example, bookkeeping data);

**Typical for enterprise data:** data for certain enterprise;

**Standard data:** average data, approximate, experimental etc.

For planning the following data is used, as a rule:

- typical for enterprise and secondary data, as possible;

- secondary and standard data, if needed.

Standard data will be used only if the calculation of typical for enterprise data is impossible or is very expensive. The main indices should be compared with bookkeeping data, if possible.

***Data gathering.*** It is suggested to use different informational digests to find and gather the data about the following issues:

1. current prices and expenditures of main production assets, markets and prices forecasts;
2. actual and typical for the region agriculture production processes’ marginal income calculations;
3. description of production equipment, typically used for production processes;
4. production and economic plans for typical enterprises;
5. bookkeeping and statistical data for fixed costs planning.

***Bookkeeping and tax balance.*** Bookkeeping covers all annual economic operations. However, this doesn’t take into account that some expenditures were made and accounted previously, so it is necessary to analyze bookkeeping reports in progress.

**3. Secondary information**

The analysis of enterprise’s functioning is aimed at the following:

- to describe the current situation at an enterprise;

- to identify the economic and social-economic problems of an enterprise;

- to analyze the aims of an enterprise and the progress towards their achievement;

- to reveal the problems of current production organization, design and implementation of measures of enterprise development.

During the analysis the following indices of are calculated and assessed:

- profitability (economic efficiency of production assets used);

- liquidity (ability to pay obligations in time);

- stability (ability to ensure the profitability and liquidity in long-term period at unexpected risk cases).

There are some measures allowing to improve the enterprise’s results:

1. the rationalization, that is the improvement of enterprise’s results by means of available resources optimization. It presupposes:

- the provision of optimal intensity (optimal quantity of used raw materials);

- the ensuring of optimal costs structure (combination of production assets that ensures minimal costs);

- the ensuring of optimal production direction (by optimal choice and combination of available resources).

1. the expansion, that is an enlarging of production process by means of production assets purchasing or rent.
2. the integration, that is the expansion of production process by means of cooperation. Production assets could be purchased and used by some enterprises jointly.
3. the combination, that is joint use of production factors for several production processes of an enterprise.

It is desirable to implement all above-mentioned measures as a complex. There are some questions that could help to identify the problem areas, where improvements are necessary and urgent. They are the following:

- How can we use available unused resources, such as family labor, employees, buildings?

- How can we improve production equipment?

- What new production process is enterprise interested in? Which of them are suitable for improvement of enterprise’s results?

- What measures allow reducing the risk?

- What are the perspectives for enterprise functioning in a long-term period?

Table 3.1 – Stages of economic planning

|  |  |  |  |
| --- | --- | --- | --- |
| 1. Enterprise description | | | |
| General information (economic conditions for enterprises of certain region are the same) | | | |
| Legal and organizational data | Climate and land | Market conditions and infrastructure | Social-economic relations |
| Identification of available production assets and production limitations (fact) | | | |
| Land | Labor | Assets and capital | Other limitations |
| Different quality,  rent ability | Family, fixed and seasonal employees | Buildings, machines, animals, other assets | crop rotation, cattle-places, others |
| Description of production processes (Enterprise-fact) – marginal calculation of income and production factors requirements | | | |
| Plant growing | Feed crop production | Livestock | |
| Calculation of economic and production indices (Enterprise-fact):  - combination of production processes; - estimation of economic efficiency indices (total marginal income, profit, own capital size, etc.) | | | |
| 2. Economic activity analysis (enterprise analysis) | | | |
| Assessment of such indices | | | |
| Profitability | Stability | Liquidity | |
| Identification of enterprise development problems and capabilities to solve them by means of: | | | |
| Rationalization | Expansion | Integration | Combination |
| 3. Implementation of additional production processes | | | |
| Listing and description of additional production processes for economic plans of enterprise (marginal income calculation with production factors requirements) | | | |
| Plant growing | Feed crop production | Livestock | |
| 4. Description of all possible production processes | | | |
| Description of all potentially possible production processes for enterprise-plan:  - necessary production indices are presented at table form; - the scales of competitiveness are determined with program planning II method, advantages of certain production process are identified based on production factors recoupment. | | | |
| 5. Drafting of enterprise plans | | | |
| *Optimizing Enterprise-fact: the o*ptimization of current production process (without investments) shows the alternatives of enterprise development without production factors changes, gives the bases for its comparison with enterprise-plan | | | |
| *Subsequent enterprise plans:* formation of the plans of further enterprise development in different cases (different market conditions, different production factors availability etc.). | | | |
| 6. Further special analysis | | | |
| More detailed assessments by means of: | | | |
| *Enterprise analysis* | profitability, liquidity and stability assessments | | |
| *Financial analysis* | identification of financing requirements and sources | | |
| *Dynamic calculation* | accounting of time influence into profitability and liquidity of investments | | |
| *Risk assessment* | accounting of doubtful data influence into enterprise profitability and liquidity by means of sensitive analysis etc. | | |
| 7. Assessment of enterprise plans and choice of “Optimal plan” | | | |
| After implementation of above-mentioned stages entrepreneur choose the optimal plan for production development | | | |

# 

# **Practical class**

|  |  |  |
| --- | --- | --- |
| Результат пошуку зображень за запитом "practical class symbols" | *Student must know* the types and sources of data used, and main characteristics of enterprise planning *and be able* to apply the theoretic knowledge at practical decision-making | |
|  |  | |
| Результат пошуку зображень за запитом "question symbol" | | **Control questions:**   1. Name the types of information used for enterprise planning. 2. What are the main sources of information used for planning? 3. What are the main indices used for planning?   **Questions for discussion:**   1. What information is used for planning first? 2. Explain the role of different types of information in planning process. |

**Solve the tasks:**

**Task 1.** Please find the information, important for the enterprise’s activity planning for your country/region/district, as qualitative and quantitative, according to the Table 3.1.

## Theme 4. Property and capital.

*The aim of theme’s study is* to study the stages of scheduling, elements and structure of balance sheet as well as the procedure for total marginal income calculation.

|  |  |
| --- | --- |
| Пов’язане зображення | **Plan.**   1. Drafting of production processes for enterprise-Fact |

1. **Drafting of production processes for enterprise-Fact.**

Description of assets and capital is the important element of enterprise analysis and planning. It includes description of assets structure and its financing; calculation of own, loan and general capital values; calculation of annual costs of assets maintenance; description of interest rates and credit payments of enterprise-fact; identification of value of assets that could be potentially sold (for example, animals).

The most preferable form of assets and capital plan is simplified balance. Its left side describes assets of enterprise (assets) and right side – financial sources of assets formation (liabilities). It is shown at table 4.1.

Table 4.1 - Schematic presentation of enterprise balance sheet

|  |  |
| --- | --- |
| Assets | Liabilities |
| Land | Own capital |
| Buildings, constructions, perennial cultures |
| Machines and equipment |
| Financial assets |
| Animals |  |
| Current assets:  work in progress  stocks  financial assets | Debts (loan capital):  long-term  average-term  short-term |
| Sum | Sum |

***Assets of enterprise include the following:***

1. Land. Land is assessed by its real value. To calculate this value we can use net-rent payments (capitalized net-rent payments) or use the soil quality score (net capitalized income). If we can’t evaluate the land value, so it will be impossible to estimate the whole own capital recoupment and enterprise’s profit recoupment. At the same time, these indices are not important for planning.
2. Buildings, constructions and perennial cultures. These assets’ value is evaluated on the basis of costs of their purchasing or cost-prices of their production. If initial values of these assets are unknown, so evaluation should be done based on costs that have taken place already. For the purposes of planning the buildings are divided into certain units (for example, number of cattle-places at farm, area of warehouse). It allows determining and tracing their use in different production processes and alternative options (for example, re-building).
3. Machines and equipment.To identify the value of these assets the same principles are used as for the buildings.
4. Financial assets. Financial assets consist on insurance, stocks of another enterprises, long-term obligations, credit debts.
5. Animals. Animals could be seen as fixed and as current assets. That’s why they are presented as independent item in balance sheet. Animals are divided by types and age groups and could be evaluated on the basis of sale price.
6. Current assets. Current capital includes the following elements: sowing crops are presented as work in progress. Its value is calculated on the basis of production expenditures and costs made (costs of seed, fertilizers, plants protection, machine use and labor).

Production inventory stocks cover seeds, fertilizers and forage in warehouse. They are assessed based on costs of purchasing or production cost-price.

Financial current assets represent themselves cash at enterprise and bank balance. They also include accounts receivables.

The exact evaluation of current assets is very difficult, so it is suggested to calculate “average current capital used” and to use this index at balance sheet scheduling and its analysis.

***Liabilities include:***

1. An own capital calculated as difference between enterprise assets value and loan capital size.
2. Debts (Loan capital), including: - loan capital value including paid rent; - information about unpaid and paid credits.

Loan capital is divided into long-term, average-term and short-term debts. It is recommended to replace short-term credits by cheaper average-term credits.

Important indices for credits’ description:

Nominal value – credit value according to the loan agreement;

Year of credit reception – year, when the credit was paid to borrower;

Period of validity – the period during that the credit should be paid;

Payments (credit payments): annual rent and sum of payments. While these items differ for enterprise-fact and enterprise-plan, they should be presented independently.

Debt-fact and Debt-plan – sum of unpaid credits at enterprise-fact and enterprise-plan.

Type of credit, etc.

***Other limitations.*** Other limitations include, for example, the following:

1. Maximum volume of cultures cultivation depending on crop rotations, soil quality etc.;
2. Terms of an agreement (purchasing rights, production agreements, sale contracts etc.);
3. Legal / political issues;
4. Structure of produced goods (requirements for self-production of certain goods independently of their economic assessment);
5. Loan capital requirements.

Total marginal income is the basis of efficiency (production-economic) indices calculations for enterprise-fact. Total marginal income must cover fixed costs, namely:

1. the independent of production plan main costs (fixed costs of an enterprise): - depreciation and costs of buildings’ maintenance; - depreciation for machines; - insurance payments; - taxes and other similar payments; - other fixed costs.

b) independent of production plan costs of labor use;

c) independent of production plan costs of loan capital use (i.e. credit payments).

Total marginal income reduced on above-mentioned costs represents profit. If there are independent of production plan incomes, so profit will be increased on their sum (rent revenues, etc.)

*Total marginal income (including salary, rent payments) – fixed main costs = Enterprise’s income (remuneration of general capital, general work)*

*Enterprise’s income – Salary (with extra charges) = Net Income (remuneration of general capital, own work)*

*Net Income + – rent payments = Profit (remuneration of own capital, own work).*

Size of profit may be used for further calculations, e.g. own capital formation, threshold of creditability, income available for consumption (further use).

# **Practical class**

|  |  |  |
| --- | --- | --- |
| Результат пошуку зображень за запитом "practical class symbols" | *Student must know* the principles and elements of enterprise’s description, as well as the principles of enterprise balance sheet scheduling *and be able* to apply theoretic bases in practical balance sheet scheduling. | |
|  |  | |
| Результат пошуку зображень за запитом "question symbol" | | **Control questions:**   1. Name the main elements of enterprise’s description. 2. Name the stages of enterprise’s balance sheet scheduling. 3. What are the main indices of enterprise’s efficiency estimation? 4. Name the main elements of the balance sheet? 5. What are the main elements of liabilities? 6. What are the main elements of assets? |

**Solve the tasks:**

**Task 1.** Name the elements of “ASSETS” column of balance sheet. Create the balance sheet for “Afrodita Ltd.”, taking into account the results of task 1 topic 2 solution and additional information: to the end of 2019 enterprise has sold 45 % of produced sugar beet and 85 % of tops. Cash counts to 63 % of revenue. Another part should be paid on 17 of January 2020. Express results in a table form.

## Theme 5. Production analysis: aims, data sources

*The aim of theme’s study is* to learn and to investigate the main principles of enterprise’s activity analysis.

|  |  |
| --- | --- |
| Пов’язане зображення | **Plan.**   1. Profitability analysis. 2. Analysis of economic and social-economic problems of an enterprise |

**1. Profitability analysis.**

The analysis of enterprise and entrepreneur activity aims to characterize the current situation at an enterprise and to identify the directions of enterprise further development.

The analysis includes profitability, stability and liquidity analysis, as usual. It presupposes both vertical (change of enterprise’s indicators in time) and horizontal (comparison of similar enterprises) comparison.

The information for an analysis could be obtained in different ways. The most important data sources are bookkeeping reports and documents (balance and profit (losses) calculations), plan of enterprise development.

It is necessary to take into account that bookkeeping reports are formed by periods, while marginal income calculation describes certain object. The differences between bookkeeping and marginal income calculation are presented below.

|  |  |
| --- | --- |
| ***Bookkeeping*** | ***Marginal income calculation*** |
| formed *by period* | formed *for certain object* |
| *exact* indices | *approximate* indices |
| characterizes *past* period | characterizes *future* period |
| aim - *control* | aim - *planning* |
| *profit / losses* | *incomes / costs* |

Profit (loss) for long-term period is the main index for enterprise’s analysis. It can be calculated based on the marginal income calculation, and on the basis of bookkeeping reports, as well.

Profitability analysis allows to determine the extent to which costs of own production factors mobilization are covered, the reasons of costs remuneration deficiency and directions for the improvement of economic situation.

Profitability analysis could be carried out at the level of enterprise and for the certain production industries as well. Enterprise will be considered as profitable if costs of own production factors mobilization are covered by received revenue.

**The value of own production factors**. It is necessary to assess costs of mobilization of own production factors. The opportunity costs are used in this case.

**Profitability indices.**

**Net profit of period** (**PrP**) (principles of calculation are presented at 4 paragraph).

**Production income (PI)** is calculated as follows:

, (5.1)

Where Cp – sum of payments for loan interest, uah; S – salary, uah; Rp – rent payments (land, equipment, rights etc.), uah.

**Relative factors recoupment (RFR)** shows ratio of fact recoupment (as received income) and fact costs of production factors used.

, (5.2)

where WCc – labor and capital costs (land, nonmaterial assets, other capital), uah.

, (5.3)

where Cp – sum of payments for loan interest, uah; S – salary, uah; Rp – rent payments (land, equipment, rights etc.), uah; Poc – costs for own capital use (opportunity costs), uah; Sow – salary of unpaid workers (opportunity costs), uah.

**Profitability of total capital (PTC).**

, (5.4)

where IIC – income from total capital invested, uah; ITCa – total capital invested in average, uah.

 (5.5)

**Profitability of encircling capital (PEC).**

**Encircling capital** includes total capital reduced on land value.

, (5.6)

where IEC – income from encircling capital invested, uah; IECa – encircling capital invested in average, uah.

, (5.7)

where Rol – rent payments for own land (opportunity costs), uah.

**Profitability of rent capital (PRC).**

**Rent capital** is the total capital reduced on land and buildings values.

, (5.8)

where IRC – income from rent capital invested, uah; IRCa – rent capital invested in average, uah.

, (5.9)

where Rol – rent payments for own land (opportunity costs), uah; PrCb – interest payments for rent capital used for buildings, uah.

**Profitability of own capital (POC).**

**Own capital** is the total capital reduced on loan capital.

There are calculated profitability of own capital (POC) and own encircling capital (POEC).

, , (5.10)

where IOC – income from own capital invested, uah; IOCa – own capital invested in average, uah; IOEC – income from own encircling capital invested, uah; IOCa –own encircling capital invested in average, uah.

, (5.11)

. (5.12)

**Profitability of labor use (PW).**

Evaluation of labor profitability presupposes calculation of income related with the use of labor and its ratio to labor used.

Total income related with the use of labor (TIW)

, (5.13)

where Se – salary of employees (including extra charges), uah.

*Total income per worker (or man-hour)* is calculated as follows:

, (5.14)

where AW (w.h.) – number of workers (or work hours), person or man-hours.

Profit will be reduced on rent payments for own land, if calculation is made on the basis of an encircling own capital interest payments.

**Total income related with the use of unpaid labor (TIUW).**

**Unpaid workers** include workers that don’t receive salary because their work is remunerated by profit. There are family members, as a rule.

, (5.15)

*Total income per worker (or man-hour)* is calculated as follows:

, (5.16)

where AUW (w.h.) – number of unpaid workers (or work hours), person or man-hours.

**Net profitability** shows the extent to which the expenses ofown capital and unpaid workers are covered by received income.

 , (5.17)

Net Profitability (NPr) is calculated as follows:

. (5.18)

**2. Analysis of economic and social-economic problems of an enterprise**

Different production, technical and organizational factors influence the level of profitability. There are typical reasons of a low profitability, namely:

1. at an enterprise level: high fixed costs (of mechanization, first of all) as a result of insufficient specialization or over mechanization; low volume of output; insufficient productivity of certain industries; bad combination of production industries; high financing expenses; low increase of own capital due to low profitability or high payments; bad production organization.
2. at the level of industry: low natural productivity; low cash flows due to low quality of products; high prices due to high costs of sale and purchasing; high expenses of concentrative forage due to low quality of basic forage; insufficient use of production assets (fertilizers, plants’ protection measures); outdated technology; low volume of output.

The first stage of analysis of certain production industry profitability includes evaluation of received marginal income and its comparison with standard marginal income. The next stage includes investigation of existing deviations and their origins (concerning incomes, costs, requirements etc.). An aggregation of production processes using land allows to compare competitiveness of feed crop production and livestock production. The aggregation is based on the dependence of livestock production process and own feed production. The aggregation allows to combine production processes in such way, that demand and supply of forage are the same. To make an aggregation it is desirable to choose one animal with relative feed area or one hectare of land with relative quantity of animals as a unit of analysis. One hectare of land with relative quantity of animals is used as a unit of assessment, as a rule. It allows to identify the most beneficial livestock production process. The reimbursement sum for aggregated process is calculated as difference between reimbursement sum for livestock production process and sum of reimbursement for needed feed. Requirement of factors in aggregated process is calculated as the sum of factors’ requirements for each production processes. The aggregation form is expressed as it is shown in Table 5.1.

Table 5.1 – Production processes aggregation (example)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Production process | Arable land | Animals | Reimbursement sum (RS) per unit | Labor requirement | Balance of basic feed | Cattle-places  Cow | Cattle-places  Bulls |
| Unit of estimation | ha | heads | uah | man-hours | Mj | units | units |
| Dairy cow |  | 1 | 2500 | -50 | -24000 | -1 |  |
| a) Feed crop production | 0.5 |  | -700 | -15 | 24000 |  |  |
| b) 1 DC from FCP | 0.5 | 1 | 1800 | -65 | 0 | -1 | 0 |
| 1 ha of FCP + 2 DC | 1 | 2 | 3600 | -130 | 0 | -2 | 0 |
| Dairy cow |  | 1 | 2500 | -50 | -24000 | -1 |  |
| a) Feed crop production | 0.5 |  | -700 | -15 | 24000 |  |  |
| b) Employees |  |  | -975 | 65 |  |  |  |
| 1 DC from FCP | 0.5 | 1 | 825 | 0 | 0 | -1 | 0 |
| 1 ha of FCP + 2 DC+E | 1 | 2 | 1650 | 0 | 0 | -2 | 0 |
| Bulls on fattening |  | 1 | 1000 | -20 | -16000 | 0 | -1 |
| a) Feed crop production | 0.33 |  | -466.6667 | -10 | 16000 |  |  |
| b) 1 BF from FCP | 0.333 | 1 | 533.3333 | -30 | 0 | 0 | -1 |
| 1 ha of FCP + 3 BF | 1 | 3 | 1600 | -90 | 0 | 0 | -3 |

DC – dairy cow; FCP – feed crop production; E – employees; BF – bulls on fattening.

# **Practical class**

|  |  |  |
| --- | --- | --- |
| Результат пошуку зображень за запитом "practical class symbols" | *Student must know* the main indices of production processes description; the principles of economic-production indices evaluation and production income assessment; the principles of production factors relative recoupment evaluation *and be able* to apply theoretic knowledge for enterprise’s production-economic indices assessment and balance sheet scheduling. | |
|  |  | |
| Результат пошуку зображень за запитом "question symbol" | | **Control questions:**   1. How to calculate the profit? 2. Name the main production-economic indices for enterprise’s activity assessment. 3. Explain the principles of the calculation of total marginal income and net income.   **Questions for discussion:**   1. What is the basic index of enterprise’s efficiency evaluation? Justify your answer. 2. Why does it necessary to describe production processes with marginal income calculation? 3. What is the role of total marginal income calculation and assessment for decision-making? |

**Solve the tasks:**

**Task 1.** Assess the production-economic indices of “Afrodita Ltd” company (see task 1 at 2 paragraph and task 1 at 4 paragraph solutions).

**Task 2.** Calculate the capital requirements (current and fixed) using the data presented in table 2.1. Estimate the production income and production factors relative recoupment for “Afrodita Ltd” company (based on task 1 (previous task) solution). Take into account additional data presented in the table below (table 5.2).

Table 5.2 – Initial data

|  |  |
| --- | --- |
| Item | Size |
| Current capital: |  |
| Own, % | 85 |
| Attracted, % | 15 |
| Fixed capital: |  |
| Own, % | 55 |
| Attracted, % | 45 |
| Interest rate for assets (capital) use: |  |
| Own, % | 15 |
| Attracted, % | 16 |

**Methodical recommendations for solution:**

Production-economic indices assessment include such calculations:

Total marginal income (TMI) is calculated as follows:

, (5.19)

where MIpp – marginal income of certain production process, uah. It is calculated as follows:

, (5.20)

where TRpp – total revenue of certain production process, uah; TVCpp – time-variable costs of certain production process, uah.

Production income (PI, remuneration of general capital, general labor) is calculated as follows:

, (5.21)

where TFC – time-fixed main costs (except for salary with extra charges), uah

Net income (NI, or gross income) is calculated as follows:

, (5.22)

where S – salary (with extra charges), uah

Profit (P, remuneration of own capital, own work) is calculated as follows:

, (5.23)

where *Percents* – costs for capital use, uah; Rp – rent payments, uah.

Production income (PI) also is calculated as follows:

, (5.24)

where PrP – typical result of economic activity, uah; Cp – sum of paid loan interest, uah; S – salary, uah; Rp – rent payments (land, equipment, rights etc.), uah.

Typical result of economic activity (PrP) is calculated as follows:

, (5.25)

where Pr – profit (loss) from annual report, uah; Cnt – nontypical costs, uah; Int – nontypical income, uah; It – income tax (especially for legal entity). Typical result is the profit without special positions and related with certain period. It allows making the analysis of enterprise’s activity for 1 year.

Relative factors recoupment (RFR) shows the ratio of recoupment (as received income) and expenses of factors and is calculated as follows:

, (5.26)

where WCc – labor and capital costs (land, nonmaterial assets, other capital), uah.

, (5.27)

where Cp – sum of paid loan interest, uah; S – salary, uah; Rp – rent payments (land, equipment, rights etc.), uah; Poc – costs of own capital use (opportunity costs), uah; Sow – salary of unpaid workers (opportunity costs), uah.

## Theme 6. Stability and liquidity indices analysis

*The aim of theme’s study is* to investigate the theoretical bases and principles of an economic activity analysis; to study the main directions of the economic activity analysis.

|  |  |
| --- | --- |
| Пов’язане зображення | **Plan.**   1. Stability analysis. 2. Liquidity analysis. |

**1. Stability analysis.**

Stability analysis allows characterizing enterprise’s ability to sustain achieved levels of profitability and liquidity in long-term period and at-risk situation. Stability indices are calculated based on enterprise’s income and its assets.

***Change of own capital (OCch)*** is calculated as follows:

, (6.1)

where PrP – profit, uah; PD – personal deposits, uah; PE – personal expenses, uah.

For legal entities the sum of capital increase is added to deposits and distributed profit is added to the sum of expenses. Other expenses include personal expenses and sum of an income tax.

Agrarian enterprises need to increase the own capital due to the following reasons:

- an increase of own capital improves the attractiveness for the investments. Investments are needed for the rationalization and expansion of agriculture production.

- an increase of own capital allows to pay off debts in time and improves the own/loan capital ratio.

The ability to increase the value of own capital depends on the available investments and features of industry development. Own capital size should provide financial stability of enterprise in a long-term period.

***Loan capital share and its coverage***. These indices show the share of loan capital in enterprise’s balance sum. Loan capital coverage index shows the share of loan capital that can be remunerated at the expense of high liquid assets of enterprise (animals, current assets, work machines, financial resources). High level of coverage (index size > 1) illustrates high stability of enterprise, i.e. it is able pay off all debts quickly and with minimum losses (losses are related with the sale of assets, especially land). Otherwise (index size ‹ 1) it is necessary to increase the own capital value.

***Fixed assets existence.*** It is calculated as ratio of fixed assets (depreciated) value and total enterprise’s assets value. High level of enterprise’s fixed assets existence limits enterprise’s ability to adapt to dynamic market and production conditions. In agriculture this index equals 30% approximately, but it depends on used methods of assets evaluation.

***Degree of fixed assets depreciation.*** It is calculated as ratio of balance and initial value of assets. Low level of index size shows high age of used fixed assets. If index size equals to 0.5, so it will show that enterprise systematically invests in fixed assets. This statement will be right, if inflation is 0.

**Stability indices (by income criterion)**

***Profit share***. It is calculated as a ratio of enterprise’s profit and revenue. The increase of this index is good for enterprise.

***Marginal income share***. It is calculated as a ratio of enterprise’s marginal income and revenue.

**2. Liquidity analysis****.**

This analysis allows to determine the enterprise’s ability to pay obligations in time. There are distinguished a momentary liquidity and a liquidity for certain period.

The momentary liquidity is the ratio between available assets to pay for the obligations in a short- and average-term period and sum of short-term loans. There are the following liquidity indices:

***Cash Liquidity*** =, (6.2)

***Short-term Liquidity*** = , (6.3)

***Av.-t. Liquidity =***, (6.4)

***Payments flow to receptions flow.*** The comparison of payments and receptions for certain period allows determining the excess or the deficit of financial resources to the end of period (year).

***Threshold of credit payments***. Threshold of credit payments has an important role for supporting the liquidity and planning of investments with the loan capital use. For the long-term period it is suggested to ensure the sufficiency of own capital value to pay off current and new expected loans. The risk also needs to be taken into account (5-10% of net production income). Amortization payments for long and average term fixed assets could be used as payments for the loans increasing the credit ability of an enterprise in a long-term period. All liquid assets, i.e. other amortization payments, nonproduction assets (nonproduction income, revenue from other activities) could be used as sources for loan payments in a short-term period. Principles of calculation of threshold of credit payments are given below.

***Long-term threshold of credit payments***, TCPl-t (Threshold of interest payments):

, (6.5)

where OC – own capital, uah; R – risk payments (5-10% of gross income), uah; P – current sum of interest payments for loans, uah.

***Average-term threshold of credit payments***, TCPa-t :

, (6.6)

where Dd – amortization payments for new long-term fixed assets (buildings, perennial cultures, melioration), uah.

***Short-term threshold of credit payments***, TCPs-t (actual ability to pay off loans)

, (6.7)

where Do – other amortization payments, uah; Np – nonproduction assets, uah.

Certain thresholds of loans’ payments (long-, average- and short-term) reduced on current loan (credit) payments represent the reserves to pay off new loans (RC).

*,* (6.8)

The reserve to pay off new loans calculated as ratio of credit payment and threshold of credit payments. It allows to express threshold of credit payments exhausting (ETCP) by current loans.

, (6.9)

If result is less than 100%, so there will be found the reserves. Otherwise it shows the exceeding of the limit. Threshold of credit payments evaluation is based on average data for several years.

***Financial potential (Cash flow).*** The calculation of this index is made for certain economic period (financial year, as a rule). It allows to determine the sum of liquid own assets available for the investments. The cash flow (CF) evaluation is made as follows:

, (6.10)

where Dd – amortization payments, uah.

, (6.11)

where IC – invested (used) capital, uah; C – costs (profit distribution), uah.

, (6.12)

where CD – loans, uah.

The average values of profit, amortization payments, costs and invested capital are used for evaluation of cash-flow for a long-term period.

***Calculated duration of loans repayment*** shows the expected duration of enterprise’s loans repayment. It is calculated as ratio of net-loans and cash flow.

Net loans (annual) = , (6.13)

where CS – sum of loans, uah; DD – accounts receivables, uah; FP – securities, uah; Cash – sum of cash, current bank account, uah.

Calculated duration of loans repayment (DCR) = . (6.14)

It is important to notice, that the low profitability, high costs, high payments for the loans resulting from high loans and wrong financial policy are the most popular reasons of insufficient liquidity.

# **Practical class**

|  |  |  |
| --- | --- | --- |
| Результат пошуку зображень за запитом "practical class symbols" | *Student must know* the principles of profitability, stability and liquidity analysis; factors influencing the profitability; reasons of insufficient liquidity and ways of its improvement *and be able* to apply theoretic knowledge in practical decision-making. | |
|  |  | |
| Результат пошуку зображень за запитом "question symbol" | | **Control questions:**   1. Name the determinants of profitability. 2. What are the aims of economic activity analysis? 3. What are the stages and principles of economic activity analysis? 4. Explain the principles and criteria for the liquidity indices for certain period assessment. 5. Explain the own capital’s role concerning the agricultural enterprise development.   **Questions for discussion:**   1. What are the interrelations between profitability, stability and liquidity indices? 2. Is it necessary to analyse stability indices? Why? 3. Is it necessary to analyse profitability indices? Why? 4. Is it necessary to analyse liquidity indices? Why? |

**Solve the tasks:**

**Task 1.** Calculate the profitability indices with the use of results of solution of task 2, paragraph 4. Make the conclusion.

**Task 2.** Determine the degree of fixed assets depreciation, fixed assets existence and liquidity indices with the use of data presented in table 6.1.

Table 6.1 – Initial data

|  |  |
| --- | --- |
| Item | Size |
| Initial value of fixed assets, uah | 6 000 000 |
| Residual value of fixed assets, uah | 4 500 000 |
| Current assets value, uah | 1 500 000 |
| Inventories value, uah | 120 000 |
| Financial deposits, uah | 500 000 |
| Short-term accounts receivables, uah | 200 000 |
| Short-term loans, uah | 220 000 |
| Cash, uah | 20 000 |
| Bank account, uah | 50 000 |

**Task 3.** Determine the Cash flow 1 with the use of data presented in table 6.2.

Table 6.2 – Initial data

|  |  |
| --- | --- |
| Item | Size |
| Total marginal income, uah | 3 000 000 |
| Salary with extra charges, uah | 100 000 |
| Interest rate for own capital, % | 17 |
| Interest rate for loans, % | 30 |
| Land rental payments, uah | 11 000 |
| Technique’s amortization, uah | 5 000 |
| Building’s amortization payment, uah | 20 000 |
| Expenses of building and technique maintenance, uah | 12 000 |
| Total capital, uah | 6 000 000 |
| Loan capital, uah | 1 000 000 |

**Task 4.** Determine the Cash flow 3 with the use of data presented in table 6.3.

Table 6.3 – Initial data

|  |  |
| --- | --- |
| Item | Size |
| Total marginal income, uah | 5 000 000 |
| Salary with extra charges, uah | 150 000 |
| Interest rate for own capital, % | 10 |
| Interest rate for loans, % | 30 |
| Land rental payments, uah | 10 000 |
| Technique’s amortization, uah | 30 000 |
| Building’s amortization payment, uah | 70 000 |
| Expenses of building and technique maintenance, uah | 110 000 |
| Total capital, uah | 15 000 000 |
| Loan capital, uah | 2 000 000 |
| Personal deposits | 12 000 |
| Personal expenses | 60 000 |
| Revenue from non-production activity | 1 000 000 |

## 

## Theme 7. Different methods of enterprise planning classification

*The aim of theme’s study is* to investigate the content and principles of static and dynamic approaches in planning; to compare methods of static and dynamic approaches in planning.

|  |  |
| --- | --- |
| Пов’язане зображення | **Plan.**   1. Static methods of planning   2. Dynamic methods of planning |

**1. Static methods of planning**

The classification of methods of enterprise’s planning is given in Table 7.1.

Table 7.1 – Classification of different methods of planning

|  |  |
| --- | --- |
| Criteria | Methods of planning |
| Sphere of planning | Whole enterprise (full calculation) |
| Certain production spheres, certain objects (partial calculation) |
| Period of planning | Static method |
| Dynamic method |
| Type of calculation | Ascertaining method |
| Method of optimization (systematic calculation) |
| Initial data | Planning based on marginal calculation analysis |
| Planning independent of marginal calculation |
| Decision-making criterion | Surpluses comparison |
| Costs comparison (in certain production spheres, as usual, for example, costs of mechanization comparison) |
| Analyzed period | Calculation-fact (last period, ex post) |
| Calculation-plan (future period, ex ante) |

Full calculation (for whole enterprise) is more preferable to determine the influence of planning measures into enterprise as a whole. If planning is made for certain object, so it will be enough to use the partial calculation.

If all indices used in calculation are stable during the analyzed period, it will be enough to use static calculation. Otherwise, (for long-term planning with changeable indices, for example, prices and costs) we must use dynamic calculation.

Calculation based on ascertaining method is less time-consuming and easier, because it presupposes calculation of results of certain planning measures based on complete and reliable information. Method of optimization allows forming the optimal plan of production organization, depending on set objectives (for example, maximum profit or minimum costs etc.)

The planning process based on marginal income calculations gives an objective information about certain production spheres and their features. That’s why it is more preferable for whole enterprise planning.

The comparison of surpluses is the most important (and preferable) criterion for decision-making, as it allows to take into account output and costs. If size of output value is known, so it will be enough to compare costs.

It is recommended to use the static calculation based on marginal income calculation to plan the future development of agricultural enterprise. It allows to trace multilateral relations between certain spheres of production. Important economic indices are presented in convenient plan (which is less time-consuming). So, it doesn’t require difficult calculation operations and special technique for calculation but allows to make rational decision.

**2. Dynamic methods of planning**

Full dynamic calculation is more difficult than static. It is not possible to completely embrace all economic operations (spheres), especially while planning finances. The difference of static and dynamic methods is presented at Scheme 7.1.

Scheme 7.1 presents the annual differences between expenses and receipts with certain measures (for example, investments) and without them. It is considered that difference between expenses and receipts equalsto difference between output and costs without measures (for example, purchasing of new fixed assets instead of outworn equalsto amortization payments).

Implementation phase

Production phase

Basic moment

Static calculation

Without measures

Receipts-Expenses = Output-Costs

With measures

Output-Costs

Receipts-Expenses

Static comparison with/

without measures

1

2

3

4

5

0

Scheme 7.1 - Static and dynamic planning approaches

Certain receipts and costs for certain periods (quarter, half-year, year) are considered and calculated separately in dynamic planning, while static method is based on output and expenses accounting. These definitions are described in-depth in table 7.2.

While output is evaluated in an easy way, expenses are differentiated as follows:

- long-term production assets: amortization payments, interest payments for invested (used) capital, maintenance expenses, which are calculated depending on the term of assets use;

- other production assets: expenses of production factors for certain period during production phase (for example, forage expenses, seeds, fertilizers);

- labor and services: salary (incl. extra charges), family workers salary and payments for the services;

- other: insurance, taxes and other expenses for certain period of production cycle.

Table 7.2 - Receipts and expenses, output and costs: definitions

|  |  |
| --- | --- |
| Costs | Receipts |
| All means of exchange of an enterprise payed and registered in cash department or bank. Costs include payments for the loans. | All means of exchange of an enterprise received and registered in cash department or bank. Receipts include receipts of the loans. |
| Expenses | Output |
| Value decreasing by means of production factors use for certain output obtaining. Expenses are accounted by objects. | Monetary value of produced goods and services. |

The use of unpaid production factors (own capital and own work) reduces value and leads to the increase of opportunity costs.

The basic moment for static calculation could be set at any point (moment) of production cycle. Evaluation of important indices at basic moment presupposes identification and assessment of all factors influencing the development of an enterprise (market and price relations, agrarian policy). It is necessary to investigate the enterprise development (enterprise-fact) without measures implementation before basic moment as well as estimate the result of measures planned.

The simplified enterprise planning presupposes comparison of the following cases: - Results of enterprise-fact (without measures implementation) at planning moment; - Results of enterprise-plan at production phase of measures implementation, if factors (for example, prices) are stable.

# **Practical class**

|  |  |  |
| --- | --- | --- |
| Результат пошуку зображень за запитом "practical class symbols" | *Student must know* the important methods of static planning; the advantages and limitations of static planning; the features of dynamic planning *and be able* to assess the value taking into account the time; to evaluate indices of enterprise’s economic efficiency. | |
|  |  | |
| Результат пошуку зображень за запитом "question symbol" | | **Control questions:**   1. What are the main methods of static planning? 2. What are the aims of static planning? 3. What is the content of static planning? 4. Explain the difference between the static and dynamic approaches of planning. 5. What is the content of dynamic planning?   **Questions for discussion:**   1. What spheres of economic activity are the most preferable for dynamic planning? 2. Are there any limitations of static planning methods use? 3. What is the need for dynamic calculations in agriculture? |

**Solve the tasks:**

**Task 1.** Determine the net income and profit of enterprise with the use of data given in table 7.3

Table 7.3 – Initial data

|  |  |
| --- | --- |
| Item | Size |
| Total marginal income, uah | 3 000 000 |
| Salary with extra charges, uah | 30 000 |
| Interest rate for own capital, % | 8 |
| Interest rate for loans, % | 20 |
| Land leese payments, uah | 7 000 |
| Technique amortization, uah | 130 000 |
| Building amortization, uah | 90 000 |
| Costs of building and technique maintenance, uah | 40 000 |
| Total capital, uah | 20 000 000 |
| Loan capital, uah | 6 000 000 |

**Task 2.** Determine the net profitability of an enterprise with the use of data given in table 7.4

Table 7.4 – Initial data

|  |  |
| --- | --- |
| Item | Size |
| Total marginal income, uah | 3 000 000 |
| Salary with extra charges, uah | 100 000 |
| Profit of entrepreneur and family members, uah | 30 000 |
| Interest rate for own capital, % | 7 |
| Interest rate for loans, % | 11 |
| Land leese payments, uah | 5 000 |
| Technique amortization, uah | 20 000 |
| Building amortization payment, uah | 12 000 |
| Costs of building and technique maintenance, uah | 50 000 |
| Total capital, uah | 1 000 000 |
| Loan capital, uah | 60 000 |

**Task 3.** Estimate the future value of current deposit (25 000 uah), if annual interest rate is 15 % and duration of investment is 3 years. Interest payments are paid every month and reinvested.

**Task 4.** Farmer has decided to start a deposit. He wants to receive 100 000 uah after 5 years. Annual interest rate is 20 %. Determine the sum of current investments.

**Task 5.** Determine the present value of investment project with 25 000 uah of initial investments and fixed annual receipts – 10 500 uah (receipt begins in t1) during the 5 years; p= 15%.

**Task 6.** Estimate the present value of “eternal” rent of 500 uah per year, p= 8%.

**Methodical recommendations for the solution:**

Future value (FV) of invested capital is calculated as follows:

, (7.1)

where PV – present value of invetsments, uah; i – interest rate; n – duration of investments, years.

Present value (PV) of investment project with initial investments in period t0 and fixed annual receipts during the certain time is calculated as follows:

, (7.2)

where a – periodic fixed payment (receipt), uah; q = 1+ i; E0 – sum of initial investments in period t0, uah.

Present value of “eternal” rent is calculated as follows:

, (7.3)

## Theme 8. Static methods of enterprise planning

*The aim of theme’s study is* to investigate static methods of planning, i.e. creating budget of an enterprise and program planning methods.

|  |  |
| --- | --- |
| Пов’язане зображення | **Plan.**  1. Enterprise’s budget  2. Program planning |

1. **Enterprise’s budget**

Scheduling of enterprise’s budget presupposes identification and evaluation of alternative forms of production organization, their comparison and choice of a more preferable. It presupposes estimation of different economic indices (marginal income, net income, profit etc.) for enterprise-fact and different plans. There are different methodical tools of enterprise’s budget scheduling.

The main indices (income, costs) for enterprise-fact and enterprise-plan are calculated based on profit or losses evaluation. Results of economic activity are evaluated by means of partial calculations, for example: 1) Plant-growing production process: plan of orders, seed expenses, fertilizers expenses, etc. 2) Livestock production process: plan of herd, forage and milk production plans, etc.

The above-mentioned plans together with labor, mechanization, buildings and financial plans are used to assess the final results of enterprise’s activity. However, there are some shortcomings of such approach, in particular, the absence of information about technology’s advantages (or disadvantages) for enterprise-plan. In order to solve this problem methods of planning based on marginal income calculation are used. It allows to choose the most preferable method of production.

1. **Program planning****.**

The program planning is an extension of linear programming developed at 50th years in USA as simplified method of planning. The “Program planning I” and “Program planning II” methods were developed in Germany.

Program planning II ensures an optimal production organization by means of systematic calculations. Program planning methods differ from enterprise’s budgeting. The differences are the following: - the program planning is based on marginal calculations for different production technologies; - certain stages of program planning are well-known. The program planning II have the following features:

- a marginal income is calculated according to the marginal value principle, i.e. the costs related with the change of factors’ use (salary, rent, interest rates, etc.) are seen as marginal costs;

- plant growing and livestock technologies are aggregated in different combinations. It allows to determine the optimal direction of land use within the livestock production;

- all technologies are described with competitiveness assessment;

- production technologies are ranked by the involvement and use of limiting factor based on competitiveness scales;

- the most competitive production technology with regard to the limiting factor use is expanded;

- technologies are chosen and combined in a way leading to the total marginal income increase (taking into account opportunity costs).

Consequently, the program planning II method results with the plan of production process organization ensuring the highest size of marginal income. However, it is very time-consuming.

The program planning includes the following stages:

1. Selection and evaluation of production technologies (by marginal income calculation);
2. Combination of production technologies with the aim to maximize the total marginal income.

More preciously, the program planning II is done in several steps, namely:

|  |
| --- |
| *Data gathering and description of enterprise-fact* |
| *Enterprise’s analysis* |
| *Identification (evaluation) of possible additional production processes for further planning, aggregation of feed crop production and livestock production processes* |
| *Creation of a plan of all possible production processes* |
| *Evaluation of alternative plans* |
| *Plans’ assessment and choice of an “Optimal plan”* |

***Data gathering and presentation of enterprise-fact.*** The plan scheduling begins with the initial situation description. There are the following important issues to be described: - economic conditions (nature and climatic features, market and socio-economic conditions); - available production factors (land, capital, labor); - description of production processes of enterprise-fact; - evaluation of enterprise-fact results. The simple presentation of production processes identification and description is presented in table 8.1.

Table 8.1 – Production processes description (enterprise-fact)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Criteria | Reimbursement sum | Area, ha | Work, man-hours | Basic forage,  Mj | Cattle-place, cows | Cattle-place,  bulls | Quota,  c |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Productive capacity | - | 50 | 3170 | - | 40 | 20 | 6000 |
| Production processes | | | | | | | |
| Winter wheat | 1100 | -1 | -15 |  |  |  |  |
| Sugar beet | 4000 | -1 | -50 |  |  |  | -600 |
| Feed crops | -1400 | -1 | -30 | 48000 |  |  |  |
| Dairy cow | 2500 |  | -50 | -24000 | -1 |  |  |
| Bulls on fattening | 1000 |  | -20 | -16000 |  | -1 |  |

“-” is the influence of certain production process on relative productive capacity.

**Example of optimization with the use of Program planning II method****.**

Agriculture enterprise has 5000 ha of land. It is used for grain and feed crop production. Available production factors: work – 200000 man-hours; farm capacity – 3500 cattle-places.

Reimbursement sum for different production processes are as follows: grain growing production – 1000 uah/ha; Dairy cows (DC) – 2750 uah/1 cow; bulls on fattening – 1050 uah/1 bull. Variable costs for feed crop production counts to 500 uah/ha. Work requirements: grain growing – 12 man-hours/ha; feed crop production – 14 man-hours/ha; dairy cows – 53 man-hours/cow; bulls on fattening – 17 man-hours/bull. Requirement of cattle-places for 1 cow is 1.1, for 1 bull - 1.3. Requirement of energy from basic feed for each cow is 2500 kStU and for bull - 1667 kStU. 1 ha of feed area provides 5000 kStU. Identify the optimal plan of production organization. Criterion is the maximum total sum of reimbursement.

***Solution***

Table 8.2 - Initial data

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Production process | Unit of estimation | Sum of reimbursement, uah | Requirement of factors | | | |
| Land, ha | Cattle-places | Work, man-hours | Basic forage,  kStU |
| Grain | 1 ha | 1000 | 1 |  | 12 |  |
| Feed | 1 ha | -500 | 1 |  | 14 | 5000 |
| Dairy cow | 1 cow | 2750 |  | 1.1 | 53 | -2500 |
| Bulls on fattening | 1 bull | 1050 |  | 1.3 | 17 | -1667 |
| Capacity |  |  | 5000 | 3500 | 200000 |  |

Table 8.3 - Production processes aggregation

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Production process | Unit of estimation | Sum of reimbursement, uah | Requirement of factors | | | |
| Land, ha | Cattle-places | Work, man-hours | Basic forage,  kStU |
| Grain | 1 ha | 1000 | 1 |  | 12 |  |
| Feed +2 DC | 1 ha | 5000 | 1 | 2.2 | 120 | 0 |
| Feed + 3BF | 1 ha | 2650 | 1 | 3.9 | 65 | 0 |
| Capacity |  |  | 5000 | 3500 | 200000 |  |

Table 8.4 - Competitiveness scale (sum of reimbursement per each production factor)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Production process | Land | | Cattle-place | | Work | |
| uah/ha | rank | uah/place | rank | uah/m.-h. | rank |
| Grain | 1000 | 3 |  |  | 83.3 | 1 |
| Feed +cow | 5000 | 1 | 2273 | 1 | 41.7 | 2 |
| Feed + bulls | 2650 | 2 | 679 | 2 | 40.8 | 3 |

**Linear programming** allows choosing the optimal production organization plan with the aim of profit maximization. But it is possible with the use of computer software, as a rule. It has some advantages in comparison with program planning. There are the following:

1. Model could be more complex, i.e.

- it could include some technologies, limitations and additional social-economic parameters;

- the optimal intensity and optimal factors combination could be ensured;

- it is possible to include demand and supply relations, and transaction costs.

b) Result of planning is mathematically exact plan of optimal production process organization. It allows to determine the influence of different factors into results of enterprise’s economic activity. We can estimate the alternative variants of production organization easily and quickly.

a) It allows to investigate typical phases of enterprise’s development.

b) It allows determining the important indices that are necessary to economic activity assessment:

- marginal value of completely used production factors in economic model (for example, profit on “last” used work hour or “last” used hectare of land);

- marginal sizes of losses for production technologies excluded from the optimal plan;

- sphere of stability of marginal value for completely used production factors;

- sphere of stability of marginal income, that shows the range of marginal income values.

Linear programming requires a big amount of reliable information. It can be used for whole enterprise planning and for optimization of certain production spheres, for example, determination of optimal content of forage mixtures, fertilizers combination etc. Linear programming allows to determine optimal content of forage with minimum costs.

# **Practical class**

|  |  |  |
| --- | --- | --- |
| Результат пошуку зображень за запитом "practical class symbols" | *Student must know* the types of static planning methods; the features of program planning methods *and be able* to make practical calculations with the use of static methods of planning. | |
|  |  | |
| Результат пошуку зображень за запитом "question symbol" | | **Control questions:**   1. Explain how to calculate the marginal income. 2. Name the main methods of static planning and their features. 3. Name the limitations of linear programming. 4. Explain the optimization criterion. 5. Explain the advantages of linear programming. 6. What is the most preferable sphere for linear programming use?   **Questions for discussion:**   1. What determines the type of planning method? 2. Name the advantages and limits of static planning. |

**Solve the tasks:**

**Task 1.** There are presented budgets of two Kansas organic farms (300 ha of land for each farm). These budgets are calculated on a land use value of $50 per ha. Organic farmers often receive government payments ($15 per ha). Make the conclusion about economic efficiency of presented production processes (table 8.5). What production process is more efficient? Schedule the plans of farms development for 2021, taking into account that productivity will increase on 59 %, corn price will increase on 10 %, fuel prices will increase on 15 %, work productivity will increase on 8 %. Express results in table form

Table 8.5 - Kansas organic farms budgets 2020 (corn growing)

|  |  |  |
| --- | --- | --- |
| Corn (per acre) | Farm A | Farm B |
| Income | ? | ? |
| Yield (bushels) | 70 | 90 |
| Price ($/bushel) | 3.5 | 3.75 |
| Total income | ? | ? |
| Variable expenses | ? | ? |
| Seed, $ | 35.00 | 25.00 |
| Fertilizer (chicken litter compost, $ | 40.00 |  |
| Fuel, $ | 7.00 | 7.00 |
| Repairs, $ | 14.00 | 14.00 |
| Marketing fee at 5% of sales, $ | ? | ? |
| Land use value, $ | ? | ? |
| Machinery use value, $ | 19,20 | 19,20 |
| Total expense, $ | ? | ? |
| Net income toward labor, $ | 107.55 | 165.42 |

## Theme 9. Simplified planning

*The aim of theme’s study is* to learn the procedure of program planning II and its simplified form.

|  |  |
| --- | --- |
| Пов’язане зображення | **Plan.**  1. Enterprise-Fact description  2. Enterprise activity analysis |

**1. Enterprise-Fact description**

***Methods of enterprise optimization*** (Linear programming, Program planning II) allow:

- to identify the optimal production organization;

- to express different economic interrelations in agriculture enterprise;

- to plan the activities of an enterprise typical for the region.

However, these methods are very time-consuming, so the simplified planning procedure is aimed at:

- presenting the important production-economic interrelations at a simple form;

- making the plan interpretation (explanation) easier;

- making the plan easier for the implementation;

- using the intelligible indices of efficiency assessment (comparable marginal income).

***The procedure of simplified planning*** includes the following steps:

- Description of enterprise-fact;

- Enterprise’s analysis;

- Planning of enterprise’s development;

- Evaluation and choice of the optimal plan.

The simplified plan presents an approximate model of the enterprise. It includes calculation of total marginal income and marginal income calculations for certain production processes. The sum of comparable marginal income is used to compare different plans of the enterprise development.

**2. Enterprise activity analysis**

The next stage of planning process is identification of possible production directions and drafting of appropriate plans. There are some spheres of analysis that are often necessary to make planning more effective:

*Analysis of enterprise efficiency indices.* Based on enterprise-fact analysis we are able to determine the indices of enterprise efficiency: profitability, liquidity, stability. It allows determining the influence of measures planned to be implemented into the factor’s recoupment, own capital, income, payments and to compare that with enterprise-fact case. To do this farmer need to know fixed costs, loans, payments, financial plan and balance sheet of the enterprise-fact.

*Analysis of financing.* Planning the investments presuppose drafting of enterprise financing plan and plan of capital investments (by years). The plan of capital investments provides a review of investments planned (requirement of capital and costs of investing). A financial plan describes sources of financing and requirements (by months or quarters). It allows determining the requirement of loan capital.

*Dynamic calculation*. This calculation is needed when static methods are not enough to solve enterprise problems. Dynamic calculation is often used to evaluate costs and outputs in a long-term period.

*Risk assessment.* Risk in agriculture is related with nature and climatic, economic, social, technical and legal changes. There are distinguished a production risk, market risk (related with goods sale), risk of investing (as result of technical development). We can use sensitive analysis for risk assessment. It presupposes different calculations (pessimistic as usual) for one or more parameters assessing their influence into profitability and liquidity of an enterprise.

The most important indices for the plans’ comparison cover total marginal income, profitability, liquidity and stability. Besides, the following issues also should be taken into account: - behavior and aims of top management; - risk assessment; - market forecast (goods and production assets); - agrarian policy. It is important, because the decision about the enterprise further development is made by an entrepreneur, and thus depends on his knowledge about economic and production relations.

# **Practical class**

|  |  |  |
| --- | --- | --- |
| Результат пошуку зображень за запитом "practical class symbols" | *Student must know* the features of procedure of the program planning II method and its simple form *and be able* to apply the program planning II method while planning of farm development. | |
|  |  | |
| Результат пошуку зображень за запитом "question symbol" | | **Control questions:**   1. Name the main stages of program planning II. 2. What are the features of the simplified planning? 3. What information is used for the simplified planning? |

**Solve the tasks:**

**Task 1.** Agriculture enterprise has 8 000 ha of land. It could be used for grain and feed crop production. Available production factors: work – 160 000 man-hours; farm capacity – 1 500 cattle-places. Reimbursement sum for different production processes: grain growing production – 1200 uah/ha; Dairy cows (DC) – 2650 uah/1 cow; bulls on fattening production – 1150 uah/1 bull. Variable costs of feed crop production process are 600 uah/ha. Work requirements: grain growing – 15 man-hours/ha; feed crop production – 13 man-hours/ha; dairy cows – 51 man-hours/cow; bulls on fattening – 18 man-hours/bull. Requirement of cattle-places for 1 cow is 1.3, for 1 bull it is 1.1. Requirement of energy from basic feed for each cow is 1500 kStU and for bull it is 2667 kStU. 1 ha of feed area provides 5000 kStU. Describe the production processes (simplified presentation). Express results in table form.

# **Theme 10. Competitiveness scales determination**

*The aim of theme’s study is* to study the algorithm of optimal production direction choice; to investigate principles of the determination of competitiveness scales.

|  |  |
| --- | --- |
| Пов’язане зображення | **Plan.**  1. Indices of production factors evaluation  2. Relative advantages of production processes |

1. **Indices of production factors evaluation**

It is important to know the main indices describing the use of production factors within the different production directions. These indices are given in table 10.1.

Table 10.1 - Recoupment of production factors via certain efficiency indices

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Efficiency indices | Efficiency indices cover: | | | | |
| Total labor use | | Total capital use | | Entrepreneur’s activity |
| Family labor | Employees | Own capital | Loan capital |
| Production process (agricultural) |  |  |  |  |  |
| Production income | + | + | + | + | + |
| Net income | + | - | + | + | + |
| Net revenue | - | - | + | + | + |
| Total income from labor | + | + | - | - | + |
| Difference of net revenue | - | - | - | - | + |
| Enterprise (including other activities) |  |  |  |  |  |
| Profit | + | - | + | - | + |
| Income from family labor | + | - | - | - | + |
| Rent of own capital | - | - | + | - | + |
| Entrepreneur’s profit | - | - | - | - | + |

**2. Relative advantages of production processes**

Aggregation of production processes allows determining their relative advantages. It is shown in Table 10.2. If certain process doesn’t require some factor, so it will have 0 rank. It means, that this process can be repeated infinitely.

Interpretation of results depends on limited production factor.

Certain production processes should be combined in a way that leads to maximum total sum of reimbursement. That is limited by available production capacities.

If one production factor is limited, so use of another production factors will not lead to opportunity costs. Plan scheduling begins from the choice of production process, that is the best concerning the use of limited factor (rank = 0 or 1). If expansion of this production process is limited by any other production factor, there will be chosen the next by rank production process. The aim of it is to increase the total sum of reimbursement.

Table 10.2 - Determination of competitiveness scales

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Production process | Production factor | | | | | |
| Arable land | | | Work | | |
| Unit of estimation | Requirement, ha | RS/ha,  uah | Rank | Requirement, man-hours | RS/man-hours,  uah | Rank |
| Winter wheat | 1 | 1100 | 5 | 15 | 73.33 | 2 |
| Sugar beet | 1 | 4000 | 1 | 50 | 80 | 1 |
| 1 ha of FCP + 2 DC | 1 | 3600 | 2 | 130 | 27.69 | 3 |
| 1 ha of FCP + 2 DC+E | 1 | 1650 | 3 | 0 |  | 0 |
| 1 ha of FCP + 3 BF | 1 | 1600 | 4 | 90 | 17.78 | 4 |

# **Practical class**

|  |  |  |
| --- | --- | --- |
| Результат пошуку зображень за запитом "practical class symbols" | *Student must know* the content and main stages of production processes aggregation; the competitiveness scales determinants; the principles of optimal production direction choice *and be able* to make production processes aggregation; to find an optimal production direction. | |
|  |  | |
| Результат пошуку зображень за запитом "question symbol" | | **Control questions:**   1. Explain the need of production processes aggregation. 2. What is used as a unit of aggregation? 3. How is the reimbursement sum of aggregated process calculated? 4. What are the aims of aggregation? 5. What is the relative advantage of aggregated process? |

**Solve the tasks:**

**Task 1.** Determine the optimal plan of production organization. Criterion is maximum of total sum of reimbursement. Initial data is presented in task 1, paragraph 9.

## Theme 11. Marginal income calculation

*The aim of theme’s study is* to investigate the content and principles of improved marginal income calculations for an enterprise.

|  |  |
| --- | --- |
| Пов’язане зображення | **Plan.**   1. General marginal income and profit of enterprise-Fact 2. Comparable marginal income at enterprise-Plan |

1. **General marginal income and profit of enterprise-Fact**

Marginal income calculations used in Program planning I are made by practical method. These calculations take into account general proportional variable costs, but don’t include seasonal workers salary and interest payments for invested capital.

General proportional variable costs include the following items, as a rule:

1. plant growing production (seed costs, fertilizers costs, costs of plants treatment, variable costs of own mechanization, costs of machines’ leasing, special insurance);
2. livestock production (costs of herd repair, forage costs, veterinarian services and special insurance costs, variable costs of own mechanization, costs of machines’ rent, electricity and water supply costs).

This method presupposes the use of typical data (from digests) due to actual enterprise’s data absence.

***Total marginal income and profit of enterprise-fact.*** Total marginal income is calculated based on certain production processes’ marginal incomes. It is necessary to multiply certain marginal incomes and volumes of output for production processes of enterprise-fact to estimate the total marginal income.

The total marginal income must cover all costs that are independent from production processes. There are the following costs: amortization payments, costs of buildings and machines maintenance, general insurance of enterprise, taxes and labor union fee, independent of production costs of labor use, interest and rent payments. Certain special variable costs often are considered as fixed or general production costs instead of their accounting in marginal income calculation. It allows to make calculation easily.

A sum of enterprise income is the result of excluding the fixed costs from marginal income. The enterprise’s income shows the remuneration of all factors, namely: labor, capital, land etc. The enterprise’s income is the main index of efficiency of production-technical activity evaluation.

Profit is the result of deducting costs of loan factors or investment incomes, rent and incomes (costs) from side activity. Profit is the important index of agriculture enterprise efficiency assessment. It shows the recoupment of own work and own capital etc.

1. **Comparable marginal income at enterprise-Plan**

The increase of the total marginal income without additional costs shows the same increase of the profit. That’s why the sum of total marginal income is used as a comparable index of enterprise’s plans economic assessment. It will be true, if the following statements are right: there are no changes of fixed costs for enterprise-plan; all costs of additional long-term investments, that are not remunerated by proportional variable costs, are related with certain production processes and excluded at marginal income calculation.

Comparable marginal income of enterprise-plan equals to the total marginal income of enterprise-plan except for costs of additionally involved fixed factors and including saved costs (income) of production factors sold.

The use of this conception in practice presupposes the same principles of fact- and plan calculations of marginal income (by practical method). It means that these calculations are based on simplified calculations of marginal incomes taking into account proportional variable costs only (except for salary of employees and costs of capital use) (scheme 11.1).

|  |  |
| --- | --- |
| «  «  «  «  + Marginal income  General marginal income  х Volume  PP  Stock-raising. I  PP  Feed food production  PP Commodity goods of plant growing. II  PP  Stock-raising. II  + Marginal income  - Marginal income  + Marginal income  + Marginal income  х Volume  х Volume  х Volume  х Volume  - Fixed costs  = Profit   |  | | --- | | PP (Production process) Commodity goods of plant growing. I |   ПП  = |

Scheme 11.1 - Total marginal income and profit

# 

# **Practical class**

|  |  |  |
| --- | --- | --- |
| Результат пошуку зображень за запитом "practical class symbols" | *Student must know* the content of marginal income and principles of its calculation *and be able* to make appropriate practical calculations. | |
|  |  | |
| Результат пошуку зображень за запитом "question symbol" | | **Control questions:**   1. Name the elements of proportional variable costs. 2. How is the marginal income calculated by practical method? 3. How is the total marginal income calculated? 4. How is the profit calculated? 5. What is the comparable marginal income?   **Questions for discussion:**   1. Explain the principle of the comparable marginal income calculation. 2. How to use comparable marginal income value in the decision-making? 3. Are there any limitations of the use of the comparable marginal income value? |

**Solve the tasks:**

**Task 1.** Farmer has 50 ha of land. Data about alternative production processes are presented in table below (table 11.1). Determine comparable marginal incomes and make the conclusion about the preferable production direction. Justify your answer.

Table 11.1 – Initial data

|  |  |  |  |
| --- | --- | --- | --- |
| Item | Potato growing | Carrot growing | Wheat growing |
| Income |  |  |  |
| Productivity, c/ha | 30 | 35 | 28 |
| Price, uah/c | 1200 | 2200 | 1600 |
| Total income |  |  |  |
| Variable expenses |  |  |  |
| Seed, uah/ha | 280.0 | 200.0 | 220.0 |
| Fertilizer (chicken litter compost), uah/ha | 150.00 | 150.00 | 150.00 |
| Mechanization, machine-hours/ha | 15 | 17 | 9 |
| Fuel, uah/machine-hours | 7.5 | 9 | 8 |
| Repairs, uah/machine-hours | 8 | 8 | 8 |
| Marketing fee at 5% of sales, uah |  |  |  |
| Land use value, uah/ha | 1400 | 1400 | 1400 |
| Machinery, units | 4 | 3 | 2 |
| Machinery use value (annual lease of 1 unit), uah | 20 000 | 28 000 | 25 000 |
| Labor expenses, man-hours/ ha | 15 | 12 | 17 |
| Salary, uah/ man-hour | 20 | 20 | 20 |

**Methodical recommendations for the solution:**

Comparable marginal income (CMI) of enterprise-plan is calculated as follows:

, (11.1)

where TMI – total marginal income of the enterprise-plan, uah; Cad – costs of additionally involved fixed factors, uah; Cs – saved costs (incomes) of factors sold, uah.

## Theme 12. Forms of financing

*The aim of theme’s study is* to investigate reasons of financing, its definition and forms.

|  |  |
| --- | --- |
| Пов’язане зображення | **Plan.**  1. Classification of forms of financing  2. Credit financing |

1. **Classification of forms of financing**

The most popular criterion for the financing forms’ systematization is the legal status of creditor. According to this, there are distinguished own financing and loan financing. The financing is divided into internal and external financing by assets origins. That is shown in table 12.1.

Table 12.1 - Forms of financing

|  |  |  |
| --- | --- | --- |
|  | Own financing | Loan financing |
| Internal financing | Available profit  (own financing);  Changes in assets value and structure (amortization payments, the decrease of balance value) | Loans’ transformations (consolidation) |
| External financing | Investments (personal, stocks) | Credits |

Self-financing (profit-based financing) is the main source of agricultural enterprise financing. In this case the sum of available investments depends on economic efficiency of an enterprise. However, only part of the profit sum could be used for investments. First of all, profit is used to pay taxes, to repay the loans, and for other economic purposes (consumption, dividends, etc.). Only the remaining sum of profit could be used for investments (self-financing).

There are internal reserves of self-financing. Among them there are distinguished insufficient evaluation of assets (understated value, overstated depreciation rates) or overvalued liabilities (overvalued reserves for further payments). It leads to the implicit financing, excluded from total profit.

An assets’ transformation takes place when assets are sold or reduced (land sale, reduction of herd, reduction of stocks) leading to the increase of cash available for investments. Amortization payments are the main element of this form of self-financing. It takes place when depreciation is done rapidly, i.e. sum of amortization payments exceed real value of fixed assets depreciation. It leads to creation of implicit reserves considered as reserves for the self-financing.

External financing (own). The own external own financing covers the financing by stocks and cash contributions. The feature of this form of financing is that capital is attracted from external sources. Cash contributions are provided by entrepreneurs themselves and increase of quantity of stockholders is another way of external financing. This type of financing differs from loan capital use by the absence of any remunerations (fees). Stockholders (or entrepreneurs) contribute to the management and share the enterprise’s results (profit).

The consolidation takes place when short-term credit is transformed into a long-period one. There are no any changes in assets or liabilities, but consolidation has the positive influence on liquidity and average-term profitability of business. Transformation of short-term credits into long-term leads to postponement of payments and more beneficial interest payments.

1. **Credit financing**

The most spread form of loan financing is the use of credit. The consolidation of credits is seen as an internal loan financing.

Loan capital has the following features:

- it presupposes some fee for capital use (interest payments), creditor don’t participate in decision-making, as a rule;

- loan capital is available only for limited period.

Credits are classified as follows:

1. by duration of credit and interest payment criterion:

- short-term (seasonal) credits (duration is less than 1 year);

- average-term (for agriculture enterprises duration is 1-10 years, for other industries it is 1-4 years);

- long-term (duration is more than 10 years).

2) by type of credit and interest payment criterion:

- consumer credit with fixed rates of pay-off;

- fixed payment credit;

- credit with payment at the end of validity duration;

- rent with possibility of purchase;

- credit with fixed rate of interest;

- credit with variable rate of interest;

- credit with postponement payment.

3) by loan guarantee criterion:

- credit without guarantees (blank credit);

- open credits (bill credit, guarantee credit);

- credit with guarantees (pledge credit).

4) by credit origins criterion:

- bank credit;

- trade credit;

- personal credit.

5) by credit purposes criterion:

- production credit (for production purposes);

- purchasing of production facilities credit;

- credit for investing;

- consumer credit (for personal expenses financing).

***Current account credit*** is used to cover the periodic or short-term needs of capital for internal financing. The sum of current account credit (credit limits) and interest rate are determined in agreement. Current account credit doesn’t need the loan guarantees, as a rule. Current account credits are more expensive compared with average- and long-term ones. Despite of that, current account credit could be beneficial. The example given below illustrates the benefits of current account credit for an enterprise.

|  |  |
| --- | --- |
| Sum for pay-off | 200 000 uah |
| Discount for 7 days’ pay-off | 3% |
| Sum for 30 days’ pay-off | All sum (200 000) |
| Costs of current account credit (annual interest rate) | 13% |
| Saved money (discount) | 200 000 \* 0.03 = 6 000 uah |
| Credit interest payments | 200 000 \* 0.13\*(23/360 days) = 1661 uah |
| **Current account credit benefit (saved costs)** | **6000 – 1661 = 4339** |

***Trade credit*** (Credit for purchased goods). This credit is provided by supplier. Creditor owns the goods until the complete pay-off of the credit. There is no need of credit agreement. The higher price of goods and absence of discount are lack of this form of credit. It is shown in example below.

|  |  |
| --- | --- |
| Sum for pay-off (by cash) | 200 000 uah |
| Pay-off is done after 3 months |  |
| Additional price | 3% |
| Discount | 3% |
| Costs of current account credit (annual interest rate) | 13% |
| Additional costs | 200 000 \* 0.03 = 6 000 uah |
| Saved money (discount) | 200 000 \* 0.03 = 6 000 uah |
| Credit interest payments | 200 000 \* 0.13\*(3/12 months)= 6500 uah |
| **Trade credit losses (additional costs)** | **6000 + 6000 – 6500 = 5500** |

In the case of trade credit, the hidden costs (lost discount) need to be taken into account.

**Average- and long-term bank credits with guarantees in a form of farmer’s land pledge.** This form is used for fixed assets financing, as usual, but could be used also for current assets financing (in case they are used for a long time) and for consolidation.

The important issue related with the use of loans is solvency. Persons and enterprises able to pay off debts in time are considered as solvent. The solvency depends on personal and material factors. The personal solvency takes place when person is characterized as honest, business, reliable, diligent and deserves creditor’s trust. This is verified by means of credit history investigation and interview.

The material solvency is verified by special procedure of economic audit of an enterprise, when the following issues are investigated:

- credit securing by real and nominal assets;

- long-term threshold of solvency after investments.

The long-term threshold of solvency shows the top limit of financing. Sum of loans over it threaten the stability of an enterprise.

***Special forms of loan financing*** include the following:

a) Non-monetary credit. In this case enterprise receives real production factors (land, buildings, machines) for rent payments. There is the possibility to rent whole enterprise or certain production facilities in agriculture.

b) Purchasing based on rent. Assets are transferred to consumer at once. Pay-off is carried out for certain period by determined rates (payments) or depends on certain events (for example, supplier’s death).

c) Sale with rights of lease back. Owner can sale enterprise (or its parts, other assets) with saving of rights of it economic use (management rights). Purchaser receives ownership right, allows supplier to use assets for a certain period and agrees to receive interest payments.

d) Factoring. Credit union or factoring organization purchases enterprise’s payment requirements for the goods sale. It allows enterprise to give consumer credits without negative influence on own liquidity due to risk of the payment’s absence. Factoring organization returns sum, reduced on sum of fee covering the risk and service costs.

e) Rent with purchasing right. Enterprise (or person) uses fixed assets for the rent with the fixed payments. The lease company is the owner. Enterprise is able to purchase these assets.

# **Practical class**

|  |  |  |
| --- | --- | --- |
| Результат пошуку зображень за запитом "practical class symbols" | *Student must know* the essence and classification of financing forms; the content of solvency, *and be able* to analyze types of financing and choose the most preferable. | |
|  |  | |
| Результат пошуку зображень за запитом "question symbol" | | **Control questions:**   1. Name the types of financing due to financial assets origins. 2. Name the types of financing due to creditor’s legal status. 3. Name the forms of own financing. 4. Name the forms of loan financing.   **Questions for discussion:**   1. Explain the scheme of self-financing based on the profit use. 2. Explain the scheme of self-financing based on changes of aassets. 3. Explain the essence of stocks’ release. 4. Explain the essence of implicit reserves of own financing. 5. Name the advantages and limitations of current account credit aand trade credit. |

**Solve the tasks:**

**Task 1.** Identify the optimal form of financing (paying debts) according to the data presented in table 12.2.

Table 12.2 – Initial data

|  |  |
| --- | --- |
| Indices | Size |
| Sum of debts, uah | 100 000 |
| Discount for 7 days’ pay-off, % | 5 |
| Sum for 30 days’ pay-off, uah | 100 000 |
| Costs of current account credit (annual interest rate), % | 15 |

**Task 2.** Identify the optimal form of financing (current account credit or trade credit) according to the data presented in table 12.3.

Table 12.3 – Initial data

|  |  |
| --- | --- |
| Indices | Size |
| Sum of debts, uah | 100 000 |
| Additional price, % | 6 |
| Discount for 7 days’ pay-off, % | 5 |
| Sum for 30 days’ pay-off, uah | 100 000 |
| Costs of current account credit (annual interest rate), % | 15 |

## Theme 13. Plans assessment and “Optimal plan” choice

*The aim of theme’s study is* to learn the principles of fixed production factors expenses evaluation.

|  |  |
| --- | --- |
| Пов’язане зображення | **Plan.**  1. Costs of fixed assets use as the basis for the plan’s optimization |

**1. Costs of fixed assets use as the basis for the plan’s optimization**

A choice of an optimal plan requires evaluation and analysis of profitability and liquidity indices. It will be possible, if: the main fixed costs were exactly determined at planning; the sum of planned loans and actual payments related with capital use are known; the financing plan for enterprise-plan is drafted and shows sum of interest payments and expenses of credit paying off; the data about cash and material assets deficits are known; the simplified balance could be drafted.

The comparison of enterprise plans made by profitability, stability and liquidity indices evaluation shows economic benefits and lack of proposed models of production organization. A choice of the optimal plan also depends on the entrepreneur’s vision and risk assessment, available forecasts of market and policy development.

The comparison of total marginal income of fact and plan enterprise requires some remarks concerning the total marginal income of enterprise-plan, namely:

1. additional fixed costs that arise for enterprise-plan and other additional costs are included. For example: additional costs related with buildings (amortization, maintenance, capital use); additional costs related with machinery (amortization, maintenance, capital use); additional salary of employees and family workers (opportunity costs are not considered as additional costs); costs of additional current capital use; higher costs of herd repair at animal’s purchasing instead of its own production (or otherwise, difference between cost price and market price represents additional costs); additional annual costs for supply rights purchasing; other additional fixed costs (bookkeeping, insurance); incomes’ redistribution.

b) income or costs related with production factors release (unused) and other additional incomes must be added. For example: saved salary due to the number of employees reduction; incomes from nonagricultural activity of released family workers; income from deposits or saved interest payments due to capital release (or income from assets sale); saved depreciation payments (only if revenue from assets sale equals to their balance value); other fixed costs saved (insurance, labor union fee, bookkeeping etc.); additional redistribution of income due to stimulating measures.

The movement of “dependent from plan fixed costs” from marginal income calculation into remarks of total marginal income makes the optimization of production organization impossible. But we can make an optimal decision based on marginal value principle, because difference between comparable marginal incomes of enterprise-plan and enterprise-fact equals to marginal profit (losses) exactly.

# **Practical class**

|  |  |  |
| --- | --- | --- |
| Результат пошуку зображень за запитом "practical class symbols" | *Student must know* the principles and scheme of enterprise-fact optimization; the calculation of fixed production factors expenses *and be able* to schedule optimized plan of enterprise-fact. | |
|  |  | |
| Результат пошуку зображень за запитом "question symbol" | | **Control questions:**   1. Explain the scheme of the optimal plan determination. 2. Name the fixed production factors. 3. Name the fixed costs. 4. Explain the algorithm of comparable marginal income calculation. |

**Solve the tasks**

**Task 1.** Please form the optimized enterprise-fact plan. Initial data is presented in table 13.1

Table 13.1 - Marginal income calculations for enterprise-fact

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Plant growing production processes | | | Animal breeding production processes | | |
| Item | Grain | Clover | Item | Dairy cow | Pedigree sow |
| Capacity (ha, head, cattle-places) | 30 ha | 10 ha | Capacity (ha, head, cattle-places) | 30 heads | 40 heads |
| Revenue | 1530 | 0 | Revenue | 4340 | 2000 |
| Awards | 580 | 0 | Awards | 0 | 0 |
| All Income | 2110 | 0 | All Income | 4340 | 2000 |
| Seed | 100 | 80 | Herd repair | 750 | 220 |
| Fertilizers | 240 | 500 | Forage (without basic forage) | 720 | 700 |
| Means of plants protection | 190 | 0 | Veterinarian | 140 | 100 |
| Variable costs of mechanization | 200 | 320 | Variable costs of mechanization | 160 | 100 |
| Other | 80 | 100 | Other | 270 | 250 |
| Variable costs, all |  |  | Variable costs, all |  |  |
| Marginal income | 1200 | -1000 | Marginal income | 2200 | 630 |
| Work (man-hours) | 14.0 | 28.0 | Work (man-hours) | 60.0 | 30.0 |
| Current capital, uah | 486 | 600 | Current capital, uah | 2200 | 700 |
| Basic forage, Mj |  | 40000 | Basic forage, Mj | -25000 |  |

**Task 2.** Please range production processes according to their relative advantages. Use the data given in table 13.2

Table 13.2 – Initial data

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Production process | Production factor | | | | | |
| Arable land | | | Labor | | |
| Unit of estimation | Requirement, ha | Income/ha,  uah | Rank | Requirement, man-hours | Income/man-hours,  uah | Rank |
| Winter wheat | 0 |  |  | 15 | 73.33 |  |
| Sugar beet | 1 | 4000 |  | 50 | 80 |  |
| 1 ha of FCP + 2 DC | 1 | 3600 |  | 130 | 27.69 |  |
| 1 ha of FCP + 2 DC+E | 1 | 1650 |  | 0 |  |  |
| 1 ha of FCP + 3 BF | 1 | 1600 |  | 90 | 17.78 |  |

DC – dairy cow; FCP – feed crop production; BF – bulls on fattening.

## Theme 14. Definition and bases of investment

*The aim of theme’s study is* to investigate reasons of investing, its definition and forms.

|  |  |
| --- | --- |
| Пов’язане зображення | **Plan.**  1. Property and capital  2. Definition and reasons of investment |

1. Property and capital

Assets available for agricultural production are divided into:

* Fixed assets: land, buildings, constructions, machines, financial investments etc.
* Animals: can be considered as current and fixed assets.
* Current assets: inventory, work in progress, bank account, cash, etc.

Fixed assets are being used for some years. They (except for the land) loss their value by means of depreciation charges. So fixed assets are transformed into financial assets, which could be used for investing or consumption.

Current assets are characterized by quick change between material and financial current assets. For example, current assets in form of fertilizers will be returned as financial current assets after products’ sale. These financial assets will be used for new material current assets purchasing (for next periods).

Long-term used animals are considered as fixed assets, others – as current assets, as a rule.

There are presented values and structure of agricultural enterprise’s assets in balance sheet (table 14.1).

Table 14.1 – Agricultural assets expressed in balance sheet

|  |  |  |  |
| --- | --- | --- | --- |
| Assets | | Liabilities (Capital) | |
| Fixed assets |  | Own capital | 1500000 |
| *Land*  *Perennial cultures*  *Buildings, constructions*  *Machines and technique*  *Financial investments* | 500000 |
|  |
| 800000 | Loan capital  *long-term (more than 10 years)*  *average-term (1-10 years)*  *short-term (less than 1 year)* | 100000  45000  5000 |
|  |
| 50000 |
| Animals | 200000 |
| Current assets |  |
| *Material*  *Financial* | 80000 |
| 20000 |
| Sum | 1650000 | Sum | 1650000 |

For enterprise financing we must use appropriate financial assets. It allows to ensure the financial stability. For example, the own capital and long-term credits are the most preferable resources for fixed assets financing. The duration of credit use should be compliant with the duration of fixed assets’ use.

2. Definition and reasons of investment

An investment is the transfer of cash into material assets (fixed assets, current assets, animals etc.). General receipts of money represent the gross investment. The replacing investment is the part of investments, which covers depreciation and other losses of invested assets. The sum that is higher than amortization and other losses is named net-investment. Replacing investments are used for assets renewal. Additional investments increase the production volume. Rationalizing investments are used for improvement of economic efficiency indices by means of more effective form of productive use. Modernizing investments allow to change production program or adapt it to technical development requirements.

Financing is the activity related with the attraction and use of financial assets. Financing is divided into current and momentary financing.

Current financing is aimed to finance current assets, used in certain production process. It includes replacing investments.

Momentary financing is not related with certain production period. It needs large sum of capital and include additional, rationalizing, net-investments and also consolidation and capital investments. Consolidation is considered as transformation of short-term credits (more expensive) into long-term (cheaper). Capital investments presupposes creation of new enterprises, credit unions etc.

Methods of investment efficiency estimation are divided as it is shown in Sch. 14.1.

Methods of investment efficiency estimation

Static

Dynamic

Costs comparison

Surpluses comparison

Costs comparison

Surpluses comparison

Scheme 14.1 - Methods of investment efficiency estimation

The investment efficiency assessment allows to determine:

- the economic efficiency of investments;

- the advantage of certain investment;

- the requirement of investments;

- the optimal duration of investing.

These sizes depend on the following indices:

- payments related with investments;

- periods of payments and receipts related with investments;

- interest rates.

Static methods of investment efficiency assessment don’t allow to take into account all three indices in complex, because estimation is based on average data. Static methods are preferable for estimation of investments at certain moment. They are useful for stable indices of costs, incomes. Static methods are used for approximate calculations. Simplicity of calculation is the main advantage of static methods.

Dynamic methods allow to take into account influence of payments distribution in time. Dynamic methods are preferable for estimation of efficiency of investments with irregular flow of payments during the certain periods (years). Dynamic methods are useful especially in the following cases:

- the planning is made for perennial cultures or total heads of livestock (herd development);

- the technology change is made within some stages;

- technical or economic indices are changed in time.

Economic estimation of investments by the comparison of costs will be used, if output (income) remains the same.

All economic operations related with investments are described by flow of payments. Flow of payments is divided into receipts and expenses.

Expenses include all costs, related with investments implementation. Receipts include all revenues. It is necessary to take into account all opportunity costs.

Receipts (Inflow) include all liquid assets received during the period of investing. Invested loan capital is considered as inflow.

Expenses (Outflow) include all liquid assets paid by enterprise during the investing period. It is necessary to take into account pay-offs related with loan capital (credit payments). Depreciation payments are not included, because initial value of fixed assets is taken into account completely in the moment of purchasing.

Inflow and outflow are distinguished by periods (years, months, days). The quantity of periods equals to the duration of main assets use (for example, duration of building use). It is shown in scheme 14.2.

t0

t1

t2

t3

tn

…

T0

T1

T2

T3

Tn

…

Scheme 14.2 - Intervals and time moments for multi-periodic investment calculation

Periods are designated by “t” with index. Period “t0” presents current period. There are presented relative moment of time “T” (with relative index) at the end of every period. All payments that take place during certain period are considered as they are done at the end of a period, as usual. Difference between inflow and outflow for every period gives a range of sizes, that is named Cash-flow (net-payments receipt) (Scheme 14.3).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Periods | t0 | t1 | t2 | t3 | t4 |
| Receipts | 0 | 20 | 40 | 100 | 50 |
| Expenses | 80 | 10 | 10 | 10 | 10 |
| Cash flow | -80 | 10 | 30 | 90 | 40 |

Scheme 14.3 - Cash-flow estimation

Investor compares payments, received currently with next (future) payments. The bases of comparison are the following: - income, which should be received during the year from investment or deposit, based on current payment; - interest payments which should be saved due to earlier pay-off of loan capital.

Later capital receipt leads to loss of benefit, which is estimated by means of lost profit calculation (on the bases of income and saved costs losses), i.e. opportunity costs.

Opportunity costs size depends on interest rate and interval between payment and period of analysis.

An interest rate expresses the advantage (benefit or lack) of payment at current moment in comparison with previous or future payment.

Revaluation of future payments (Cash flow) at the current moment is named discounting (removal of compound interest). Used in calculation factors are named factors of discounting. There are compound factors (multiplicators) that are used for compound interest accrual to last (previous) payments.

There are used next signs at financial-mathematic calculations: p – interest rate, %; i – interest rate as decimal number; q = 1+i; n – periods (integer).

***Discounting factor*** is calculated as follows:

, (14.1)

It expresses the current value of future payments at the level of 1 uah. It should be multiplied on relative sum. Discounting factor for T0 moment of time is 1 (payments are not revaluated).

Example of discounting factors calculation is presented in table 14.2.

Table 14.2 - Calculation of discounting factors (p = 10 %).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Period | Discounting factor (formula) | Discounting factor (formula) | Calculation | Size |
| t1 |  |  |  | 0.909091 |
| t2 |  |  |  | 0.826446 |
| t3 |  |  |  | 0.751315 |
| t10 |  |  |  | 0.385543 |

Current size of T0 becomes lower with higher interest rate and longer interval between current moment and analyzed payment.

Compounding factors are used for revaluation of last payments at current moment of time or current payments at future. Compounding factor is multiplied with relative sum.

***Compounding factor*** is calculated as follows:

, (14.2)

Example of compounding factors calculation is presented in table 14.3.

Table 14.3 - Calculation of compounding factors (p = 10 %).

|  |  |  |  |
| --- | --- | --- | --- |
| Period | Compounding factor (formula) | Calculation | Size |
| t1 |  |  | 1.1 |
| t2 |  |  | 1.21 |
| t3 |  |  | 1.331 |
| t10 |  |  | 2.5937 |

Current size of T0 becomes higher with higher interest rate and longer interval between current moment and analyzed payment.

For example: estimate the future value of current deposit (1000 uah), if interest rate is 5 % and duration of investing is 20 years.

Signs:

Kn – Value of deposit after 20 years (future value);

K0 – Current value of deposit;

(1+i)n – compounding factor.

 (14.3)

Calculation: 

Current value of range of payments equals to sum of all compounded (or discounted) at certain moment payments of certain cash-flow. Current value can be estimated for every moment T for range of payments.

***Current value estimation*** is calculated as follows:

, (14.4)

where Rt – receipt in period t, uah; Et – expenses in period t, uah.

Moment of time for which all payments of Cash flow are compounded and discounted represents basic moment of time. The current value depends on it.

Basic moment of time represents the moment of beginning of payments or beforehand, as usual. Entrepreneur’s decisions depend on economic aims (profit maximization or costs minimization) and also other factors (personal interest, future forecast, risk willingness etc.).

Decision-making criteria in investment efficiency estimation must satisfy the next requirements: - all payments, related with investment must be taken into account; - level and moment of payments must be taken into account; - criteria must be clear and logic.

Size of current value is interpreted as follows:

1. positive size of current value:

- invested capital returns completely;

- the profitability of invested capital equals to interest rate (used in calculation) and exceeds it;

- investment is effective.

b) current value size equals 0. It means that profitability of investment equals to interest rate. Invested capital returns completely with the increase of the level of calculated percentage. Investment is effective, because gives the same revenue as alternative use of capital.

c) Negative size of current value:

- investment is inefficient, because alternative use of capital is more preferable. It expresses low profitability and also capital losses.

Current value may be used as criterion of investment project choice among alternatives. These alternatives must be comparable:

- interest rate must be the same;

- sum of investment must be the same also (approximately).

Current value size depends on absolute size of cash-flow.

Internal interest rate (internal profitability) is profitability or effective interest rate of a project. This size is compared with possible interest rate (profitability of capital at alternative use).

Internal profitability calculation is based on determination of an interest rate, which transforms current value into 0. It means that current value of receipts equals to current value of expenses.

Calculation is carried out by iterations or graphic method. It is presented in table 14.4.

Table 14.4 - Calculation of internal interest rate

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| p, % | t0 | t1 | t2 | t3 | t4 | CV |
| Cash Flow | -100 | 30 | 30 | 30 | 30 |
| 5 | -100 | 28.6 | 27.2 | 25.9 | 24.7 | 6.379 |
| 6 | -100 | 28.3 | 26.7 | 25.2 | 23.8 | 3.953 |
| 7 | -100 | 28.0 | 26.2 | 24.5 | 22.9 | 1.616 |
| 8 | -100 | 27.8 | 25.7 | 23.8 | 22.1 | -0.636 |
| 9 | -100 | 27.5 | 25.3 | 23.2 | 21.3 | -2.808 |
| 10 | -100 | 27.3 | 24.8 | 22.5 | 20.5 | -4.904 |

Internal percentage is estimated by interpolation of near-by positive and negative current values. Approximate formula for internal interest rate determination (linear interpolation) is as follows:

, (14.5)

where rl – lower interest rate; rh – higher interest rate; CVrl – current value with lower interest rate; CVrh – current value with higher interest rate.

Internal interest rate is interpreted as follows:

- IRP higher than p – investment is effective;

- IRP = p – invested capital returns with required increase, but without additional profit;

- IRP lower than p – alternative use of capital is preferable;

- IRP lower than 0 – invested capital doesn’t return completely (losses of capital).

Internal interest rate does not depend on sum of investment. It is universal index and is more useful than current value estimation.

This method allows to determine duration of capital investing, that is necessary for invested capital return with certain increase. Moment of time, where this criterion is achieved, is named Break-Even Point and expresses the point, where discounted expenses are reimbursed by discounted receipts. It looks as follows:

, (14.6)

Investments with higher initial receipts are more preferable, because Break-Even Point is achieved quickly. This method is also based on current value estimation. Current values of receipts and expenses are determined independently. Then we calculate the ratio of current value of receipts (CVreceipts) and current value of expenses (CVexpenses). It looks as follows:

, (14.7)

The investment is effective with BCR >1. It means that capital increase is higher than interest rate calculated.

It is necessary to take into account that payments (receipts and expenses) must be considered (estimated) independently. Balancing doesn’t influence on Cash Flow, but influences on BCR. It is named ***Netting-out effect***. This method presupposes that current value for positive part (CVpositive) of Cash Flow (CF) is evaluated firstly, then it is estimated for negative part (CVnegative). The ratio between these sizes is named Net Benefit-Investment Ratio (NBIR). It presupposes full “Netting-out”, that’s why there are no any mistakes.

, (14.8)

This method allows to estimate influence of certain investment project implementation into cash flow.

# **Practical class**

|  |  |  |
| --- | --- | --- |
| Результат пошуку зображень за запитом "practical class symbols" | *Student must know* the forms of investments *and be able* to analyze types of financing and choose the most preferable. | |
|  |  | |
| Результат пошуку зображень за запитом "question symbol" | | **Control questions:**   1. Name the types of investments. 2. Name the types of financing due to the financial assets’ origins. |

**Solve the tasks:**

**Task 1.** Estimate the indices of efficiency of investments. Initial data is given in table 14.5.

Table 14.5 – Initial data

|  |  |
| --- | --- |
| Item | Size |
| Output, pieces | 100 000 |
| Market price of product, uah | 200 |
| Cost price, uah | 160 |
| Investments, uah | 14 000 000 |
| Fixed assets value, uah | 12 500 000 |

**Task 2.** Determine the optimal direction of enterprise development by cost reimbursement criterion. Initial data is given in table 14.6.

Table 14.6 – Initial data

|  |  |  |  |
| --- | --- | --- | --- |
| Indices | 1 direction | 2 direction | 3 direction |
| Investments, uah | 250 000 | 1 000 000 | 1 300 000 |
| Cost price of annual output, uah | 1 100 000 | 1 080 000 | 900 000 |

**Task 3.** Determine the optimal direction of enterprise development. Initial data is given in table 14.7.

Table 14.7 – Initial data

|  |  |  |  |
| --- | --- | --- | --- |
| Indices | 1 direction | 2 direction | 3 direction |
| Annual output, pieces | 110 000 | 115 000 | 125 000 |
| Investments, uah | 200 000 | 500 000 | 700 000 |
| Cost price of 1 piece, uah | 4.7 | 4.3 | 4.1 |

## Theme 15. Credit: its forms, and related costs

*The aim of theme’s study is* to learn different forms of credit; to compare different forms of credit with regard to their efficiency.

|  |  |
| --- | --- |
| Пов’язане зображення | **Plan.**  1. Forms of credit  2. Credit costs |

**1. Forms of credit**

Average-term credits are used for machines, technique and animals purchasing. That’s why they are named inventory credit. Long-term credits are used for new building, rebuilding and expansion of production facilities, as a rule. There are distinguished:

- a credit with payment at the end of validity duration (percentage pay-off during the period of credit validity or at the end of validity duration) – Table 15.3, Sch. 15.3;

- a credit with fixed rate of payment (fixed rates of payments and reducing rate of percentage due to reducing sum of debt) – Table 15.1, Sch. 15.1;

- a credit with fixed payments (credit payments (percentage + pay-off sum) are fixed, part of percentage reduces and part of pay-off sum increases) – Table 15.2, Sch. 15.2.

The efficiency of different forms of credit depends on different factors. It is shown below.

Table 15.1 - Credit with fixed rate of pay-off (example of calculation of payments’ plan)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Interest rate (n) | | | 20 % | |
| Validity duration (c) | | | 5 year | |
| Credit sum | | | 100 000 uah | |
| Year | Percentage sum | Pay-off | Credit payments | Credit sum |
| 0 |  |  |  | 100 000 |
| 1 | 20 000 | 20 000 | 40 000 | 80 000 |
| 2 | 16 000 | 20 000 | 36 000 | 60 000 |
| 3 | 12 000 | 20 000 | 32 000 | 40 000 |
| 4 | 8 000 | 20 000 | 28 000 | 20 000 |
| 5 | 4 000 | 20 000 | 24 000 | 0 |
| S | 60 000 | 100 000 | 160 000 | 300 000 |
| Average | 12 000 | 20 000 | 32 000 | 60 000 |

Commenting the table 15.1 data one should point out, thet percentage for pay-off are calculated on relative residual sum of credit. Rates of pay-off are calculated as ratio of credit sum on its validity duration (credit with fixed rates of pay-off).



Scheme 15.1 - Credit with fixed rate of pay-off (example of calculation of payments’ plan)

To provide the payments plan for the credit with fixed payment the calculation of credit factor (formula 15.1) is required. Credit with fixed payments presupposes that payments are calculated by credit factor formula. Part of pay-off sum is calculated as difference between payments and sum of percentage.

Table 15.2 - Credit with fixed payments (example of calculation of payments’ plan)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Lease | | |  | |
| Interest rate (n) | | | 20 % | |
| Validity duration (c) | | | 5 year | |
| Credit sum | | | 100 000 uah | |
| Contributions | | | 0 | |
| Year | Percentage sum | Reduction | Credit payments | Credit sum |
| 0 |  |  |  | 100 000 |
| 1 | 20 000 | 13438 | 33438 | 86562 |
| 2 | 17312 | 16126 | 33438 | 70436 |
| 3 | 14087 | 19351 | 33438 | 51086 |
| 4 | 10217 | 23221 | 33438 | 27865 |
| 5 | 5573 | 27865 | 33438 | 0 |
| S | 67190 | 100 000 | 167 190 | 335949 |
| Average | 13438 | 20 000 | 33438 | 67190 |

Credit factor = , (15.1)

where i – interest rate (in shares), n – periods of credit agreement duration.

For the example given in table 15.2, the credit factor is as follows:

CF = 0.497664/1.48832 = 0.33438 (credit payments = 33438 uah/year).



Scheme 15.2 - Credit with fixed payments (example of calculation of payments’ plan)

Enterprise can avoid financial burden in the first years of investing by special credit agreement for credit with fixed payments or fixed rates of pay-off. It means the determination of free of pay-off years. In this case rate and sum of payments are calculated based on remaining time of credit validity duration.

Credit with payment at the end of validity duration will be given if untypical receipts (for example, income from land sale, insurance receipts, another loan capital) are expected. These credits are intermediate with short- or average term of validity duration, as a rule. The advantage of this form is that capital is available in whole sum during all validity duration.

Table 15.3 - Credit with payment at the end of validity duration, fixed annual interest sum (example of calculation of payments’ plan)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Year | Percentage sum | Pay-off | Credit payments | Credit sum |
| 0 |  |  |  | 100 000 |
| 1 | 20 000 | 0 | 20 000 | 100 000 |
| 2 | 20 000 | 0 | 20 000 | 100 000 |
| 3 | 20 000 | 0 | 20 000 | 100 000 |
| 4 | 20 000 | 0 | 20 000 | 100 000 |
| 5 | 20 000 | 100 000 | 120 000 | 0 |
| S | 100 000 | 100 000 | 200 000 | 500 000 |
| Average | 20 000 | 20 000 | 40 000 | 100 000 |



Scheme 15.3 - Credit with payment at the end of validity duration, fixed annual interest sum (example of calculation of payments’ plan)

The advantages and disadvantages of the above-mentioned forms of credit are presented in Scheme 15.4.

|  |  |  |
| --- | --- | --- |
|  | Credit with fixed rates of pay-off | Credit with fixed payments |
| + | Quicker paying off;  Less financial risk;  Less sum of percentage. | Fixed payments;  Less initial financial burden;  Ability to get more financial assets within the solvency limits;  Is more beneficial at small rate of interest. |
| - | Higher initial financial load on solvency. | Higher sum of percentage;  Sum of percentage increase with growth of interest rate and term of validity. |

Scheme 15.4 - Advantages and disadvantages of credit with fixed payments and credit with fixed rates of pay-off.

**2. Credit costs**.

Costs of credit financing include sum of percentage and side costs of financing.

Side costs of financing contents:

- a fee for data processing;

- costs of expert assessment;

- a commission charge for credit allotment;

- discount – reduction of nominal sum on determined interest rate.

These costs lead to that real value of credit resources (effective interest rate) is higher than nominal interest rate. Real value of credit resources also depends on:

- quantity of payments per year;

- the moment of pay-off;

- terms of percentage pay-off (annual, half-annual, once in quarter);

- prior or further percentage calculation;

- different terms of percentage determination;

- type of credit.

Effective interest rate, i.e. fact costs of credit is calculated by method of internal interest rate. It needs exact determination of Cash flow. It is explained in example (table 15.4). In example all payments are carried out at the end of each period.

Table 15.4 - Effective interest rate by method of internal interest rate calculation

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Year | 0 | 1 | 2 | 3 | 4 | 5 |
| Debt | 10 000 | 10 000 | 7 500 | 5 000 | 2 500 | 0 |
| + credit receipt | 10 000 |  |  |  |  |  |
| - percentage 10 % |  | - 1000 | - 1000 | - 750 | -500 | -250 |
| - pay-off (1 year is free) |  |  | - 2500 | -2500 | -2500 | -2500 |
| - discount 2% | - 200 |  |  |  |  |  |
| - costs of data processing 1% | - 100 |  |  |  |  |  |
| = CashFlow | 9700 | - 1000 | - 3500 | -3250 | -3000 | -2750 |
| Internal interest rate of CashFlow = effective interest rate 11.1% | | | | | | |

Effective interest rate (EPR) can be calculated approximately in practice. Formula of approximate calculation is presented below:

, (15.2)

where r – nominal interest rate, %; SC – side costs, %; VD – validity duration, years; P – payments, %.

In example (table 15.4) ERP was calculated in the next way:



Effective interest rate size is analyzed for different credit agreement terms.

There is the possibility to get credit with subsidies within the framework of governmental supporting policy in agriculture. Agriculture enterprise can receive higher sum of credit due to lower interest rate (part of percentage is reimbursed by subsidy). The influence of this form of credit into financing costs is presented below (table 15.5).

The initial terms of credit agreement for the given example are the following: validity duration (c) = 5 year; Nominal sum = 10 000 uah; Interest rate (n) = 10 % (i = 0.10); Subsidy of interest rate is 4% (i = 0.04).

Sum of percentage and total subsidy on percentage is higher for credit with fixed payments than for credit with fixed rates of pay-off due to later moment of pay-off. It is necessary to point that subsidy is higher in every year. It gives additional advantages. Exact estimation of costs of these credits needs current values of subsidies estimation.

Table 15.5 - Credit with fixed rates of pay-off and subsidy (example of calculation of payments’ plan)

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Year | Sum of percentage | Pay-off sum | Credit payments | Sum of credit | Subsidy on percentage | Remaining percentage | Credit payments | | Factor of discount | Discount subsidy |
| Remain | Subsidy |
| 0 |  |  |  | 10000 |  |  |  |  |  |  |
| 1 | 1000 | 2000 | 3000 | 8000 | 400 | 600 | 2600 | 400 | 0.9091 | 364 |
| 2 | 800 | 2000 | 2800 | 6000 | 320 | 480 | 2480 | 320 | 0.8264 | 264 |
| 3 | 600 | 2000 | 2600 | 4000 | 240 | 360 | 2360 | 240 | 0.7513 | 180 |
| 4 | 400 | 2000 | 2400 | 2000 | 160 | 240 | 2240 | 160 | 0.6830 | 109 |
| 5 | 200 | 2000 | 2200 | 0 | 80 | 120 | 2120 | 80 | 0.6209 | 50 |
| S | 3000 | 10000 | 13000 | 30000 | 1200 | 1800 | 11800 | 1200 |  | **967** |
| Average | 600 | 2000 | 2600 | 6000 | 240 | 360 | 2360 | 240 |  | 193 |
| **Advantage of subsidy 967/10 000 = 9.67 %** | | | | | | | | | | |

It presupposes discounting of different years subsidies (they are multiplied on discount factor) and their adding. The difference of current values of subsidies shows the preferable form of financing. Ratio of current value and nominal sum of credit shows advantage of subsidy (in percentage). Current value of subsidy can be considered as one-time receipt (before beginning of investing).

There is the necessity to take into account forecast of prices development in financing planning. Inflation leads to the reduction of real credit payments. It means that within inflation influence the same sum of capital will be less expensive after some years than currently. Interrelations between credit payments and rate of prices growth are described below.

For example, rate of price growth is 3 %. So, product price (100 uah) will increase annually as follows:

100 = 103.0 = 106.1 = 109.3 = 112.6 = 115.9.

The formula for calculating the Price index (consumer price index, as usual) looks like this:

CPI can be performed as , (15.3)

The "updated price" (i.e. the price of an item at a given year, e.g.: the price of bread in 2010) is divided by the initial year (the price of bread in 1970), then multiplied by one hundred.

Determination of real values (RV) of future payments in this moment needs to discount these values, i.e. to divide them on own CPI:

, (15.4)

So, real credit payments are less than nominal.

We can determine the real recoupment of invested capital (RRC) by means of internal percentage of real Cash-flow assessment. Real recoupment of invested capital (RRC) also can be determined like this:

, (15.5)

where Prn – nominal interest rate without % sign (i.e. divided on 100); IR – inflation rate without % sign (i.e. divided on 100).

The formula for calculating the Inflation Rate looks like this:

, (4.4)

Where "A" is the Starting number and "B" is the ending number.

For example RRC is:



Approximately, the real interest rate can be calculated based on nominal interest rate and inflation rate like this:

10% - 3% = 7% (6.8%).

The real interest rate for subsidized credit (for example, subsidy is 4 %) will decrease:

.

It means that for subsidized credit financing costs are very small. In certain cases (higher subsidy or lower bank interest rate or higher inflation rate) real interest rate may reach 0 level. So, it means that debt (loan capital) may be paid off without any additional costs.

There is the necessity to take into account that the investigation of real costs of financing is important for profitability analysis, but it is not so important in financial planning. The latter requires analysis of nominal sizes.

# **Practical class**

|  |  |  |
| --- | --- | --- |
| Результат пошуку зображень за запитом "practical class symbols" | *Student must know* the different types of credit and their features; the indices, that characterize credit costs; the elements of credit costs; the influence of prices and governmental support into credit costs *and be able* to determine credit costs in practice; to form credit payments plans. | |
|  |  | |
| Результат пошуку зображень за запитом "question symbol" | | **Control questions:**   1. Name the forms of credit. 2. How is the credit factor calculated? 3. Name the features of credit with fixed payments. 4. What are credit costs? 5. What is effective interest rate? 6. Name the features of subsidized credit.   **Questions for discussion:**   1. Name the advantages and disadvantages of credit with fixed payments and credit with fixed rates of pay-off. 2. Explain the influence of governmental support into credit payments. 3. Explain the influence of inflation into credit payments. |

**Solve the tasks**:

**Task 1.** Form the plan of credit payments (credit with fixed payments). The credit agreement terms are the following: sum of credit – 100 thsd. uah, interest rate – 6%, duration is 5 years.

**Task 2.** Form the plan of credit payments (credit with fixed rate of pay-off). The credit agreement terms are the following: sum of credit – 100 thsd. uah, interest rate – 16%, duration is 3 years.

**Task 3.** Determine the real recoupment of invested capital, if the interest rate is 15% and inflation rate is 9%.

**Task 4.** Determine the real recoupment of invested capital (subsidized credit), if the interest rate is 15%, inflation rate is 9% and subsidy rate is 3%.

**Task 5.** Determine real recoupment of invested capital, if the interest rate is 10% and inflation rate is 4,5%.

## Theme 16. Liquidity and financial plan

*The aim of theme’s study is* to learn the rules of financing; to research the essence of financial planning; to learn the forms of financial planning.

|  |  |
| --- | --- |
| Пов’язане зображення | **Plan.**  1. Rules of financing  2. Budget scheduling.  3. Financial planning. |

**1. Rules of financing**

Financing rules are the good base for financial planning and enterprise’s liquidity supporting. There are distinguished:

Horizontal financing rules (rule of interrelation of balance items) – there are the interrelations between certain items of assets and liabilities.

Vertical financing rules (rule of capital structuration) – there are some quotas of own and loan capital ratio.

***Rule of financing 1: Gold balance rule.***

Fixed assets of enterprises must be financed by own capital (land, buildings, constructions and perennial cultures, as possible) and long-term loan capital (machines etc.). Own capital is the guarantee of risk and provides enterprise’s stability. Long-term capital is used for fixed assets financing. It is necessary to support enterprise’s liquidity. There is the suppose that credit payments will be reimbursed by receipts (revenues) from investing.

***Rule of financing 2: Gold rule of financing***

Duration of loan capital use can’t be more than duration of fixed assets use, which are financed from loan capital. It means that credit, received for fixed assets purchasing will be paid off during fixed assets use. Depreciation payments may be used for credit payments.

***Rule of financing 3: Variation of requirement of financial assets.***

Financing of current assets by loan capital must take into account variation of enterprise’s requirement of current assets. Validity duration of credit for current assets financing must match to fact duration of requirement of current capital. So current account credit is used for current assets financing, as a rule.

***Rule of financing 4: Timely solvency***.

Current assets (and also other assets) must be financed in such way, that relative costs (debts) will be paid off in time, with discounts, as possible. All debts must be paid off in time. Especially it is important for salary debts. Other debts (payments for goods and services) have variable terms of pay-off. As it was shown previously, suppliers’ credits are less preferable than short-term bank credits, due to losses of discounts. So, it must be taken into account.

***Rule of financing 5: Financing with minimal costs.***

Costs of financing can be reduced by means of right choice of forms and duration of financing. It needs:

- to take into account economic trends at moment of investing (bank interest rate reduction);

- to match credit agreements (effective percentage);

- to improve enterprise’s liquidity (changing of purchasing and sale terms);

- to use discounts etc.

***Rule of financing 6: Liquid assets.***

Liquid assets must be used (invested) with the highest level of profitability. Available liquid assets, which are unused for certain period may be invested in bank deposit accounts.

***Rule of financing 7: Subsidized credits.***

Subsidized credits should not be paid off beforehand. It will have sense if financial assets for paying debts may be used alternatively with higher interest rate of income. Otherwise credit should be paid off as soon as possible.

***Rule of financing 8: Thresholds of credit payments.***

Credit payments must not exceed relative thresholds of solvency (thresholds of credit payments). Enterprise’s income must reimburse credit payments (sum of percentage and sum of pay-off). Long-term threshold of credit payments (= threshold of percentage payments). Long-term threshold of credit payments represents credit payments, which should be reimburse by enterprise income without additional mobilization of depreciation receipts. It means that depreciation payments may be used for reinvesting.

**2. Budget scheduling.**

Budget is detail plan (scheme), that describes enterprise’s expenses and receipts for next period of planning – year, as a rule. It allows to plan liquidity of enterprise.

Plan of financing is used for long-term investments planning. Financial assets requirements and origins are divided by years.

Credits and moneyed deposits are considered as moneyed receipts, credit and other payments, that present moneyed expenses.

Calculation of moneyed assets moving include receipts and payments and moneyed assets availability changes. It allows to analyze financial status changes.

**3. Financial planning.**

Financial planning. Balance of financial assets at the end of period can’t be negative. In this case it should be reduced to zero size by means of loan capital use. Example of simplified financial plan is presented in Table 16.1.

Received annual surplus should be interpreted the next way:

Variant 1: Total receipt, including balance of cash-desk and bank account at the beginning of period, minus total requirement.

Variant 2: Balance of cash-desk and bank account at the end of 4th quarter minus balance of cash- desk and bank account at the beginning of 1st quarter

Line moneyed assets at the beginning of period is calculated as difference between cash-desk and bank account status at the beginning of 1st quarter and cash-desk and bank account status at the end of 4th quarter. It means: positive size - relative sum is required; negative size - there is the surplus.

Table 16.1 - Example of budget, uah

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Item | Quarter | | | | Year, all |
| 1 | 2 | 3 | 4 |
| A) Moneyed assets at the beginning of period |  |  |  |  |  |
| Initial status of cash-desk and bank account | 3000 | 1000 | 11000 | 6000 | -200\*\* |
| B) Receipts |  |  |  |  |  |
| Revenue from grain sale | 4000 | 18000 | 6000 | 25000 | 53000 |
| Revenue from livestock sale | 12000 | 4000 | 7000 | 8000 | 31000 |
| Unproduction income | 3000 | 3000 | 3000 | 3000 | 12000 |
| Current account credit (10 months) | 15000 |  |  |  | 15000 |
| Sum | 34000 | 25000 | 16000 | 36000 | 111000 |
| C) Payments |  |  |  |  |  |
| Seed | 2000 |  | 2000 |  | 4000 |
| Fertilizers | 8000 |  | 6000 |  | 14000 |
| Salary | 3000 | 4000 | 2000 | 3000 | 12000 |
| Livestock purchasing | 15000 |  |  |  | 15000 |
| Credit payments | 1000 | 1000 | 1000 | 20800 | 23800\* |
| Personal expenses | 10000 | 10000 | 10000 | 15000 | 45000 |
| Sum | 39000 | 15000 | 21000 | 38800 | 113800 |
| Surplus (+)/ Sufficiency (-) | -2000 | +11000 | +6000 | +3200 | -3000 |
| Additional requirement of credit | 3000 |  |  |  | 3000 |
| D) Moneyed assets at the end of period |  |  |  |  |  |
| Eventual status of cash-desk and bank account\*\*\* | 1000 | 11000 | 6000 | 3200 | 0 |
| Annual total surplus\*\*\*\* |  |  |  |  | 200 |
| \* 10% and 15000+3000 uah of paid sum of short-term credit (quarter 1) and also payments of average-term credit of previous year | | | | | |
| \*\* Negative sum – surplus | | | | | |
| \*\*\* It must be equal to 0 or be positive, negative sum should be covered by additional credit | | | | | |
| \*\*\*\* Annual total surplus:  Variant 1: Total receipts including initial status of cash-desk and bank minus total requirement of financial assets  Variant 2: Eventual status of cash-desk and bank account (4th quarter) minus initial status of cash-desk and bank account (beginning of 1st quarter). | | | | | |

If balance of financial plan has negative or positive size, there will be the necessity to decide the direction of surplus use and determine origins and forms of sufficient financing.

Surplus of financial assets must be put in bank. To make choice between short-term and long-term financing it is possible to use the following formula:

, (16.1)

M – Credit validity duration, months; PL – interest rate at long-term credit; PH – received interest rate at long-term credit; PK – interest rate at short-term credit.

There is presupposed, that:

- interest rate at short-term credit is higher than at long-term credit or own financing;

- long-term credit (annual credit) at the end of every year can be paid off completely;

- short-term credit should be paid off completely or partially or increased in any moment.

For example:

months. It means:

- requirement of capital with duration more than 6 months is financed by long-term credit;

- requirement of capital with duration less than 6 months is financed by short-term credit (current account credit);

- requirement of capital with duration 6 months is financed by long-term or short-term credit.

# **Practical class**

|  |  |  |
| --- | --- | --- |
| Результат пошуку зображень за запитом "practical class symbols" | *Student must know* the rules of financing; the principles of financial planning and its forms *and be able* to apply mastered theoretical knowledge in practice. | |
|  |  | |
| Результат пошуку зображень за запитом "question symbol" | | **Control questions:**   1. Name the rules of financing. Explain their essence. 2. What is the budget? 3. How to make a choice between the short-term and long-term financing? 4. Explain the principle of estimation of the long-term threshold of credit payments.   **Questions for discussion:**   1. Explain the principle of short-term financial plan scheduling. 2. Explain the essence of horizontal and vertical rules of financing and their importance. |

**Solve the tasks:**

**Task 1.** Form the annual budget for sugar beet production (“Afrodita Ltd” company), using the data presented in table below. Take into account that necessary materials and labor are spend during 1 and 2 quarter evenly, and receipts from sugar beet sale begin from 3 quarter. To the end of 2020 year enterprise has sold 45 % of produced sugar beet and 85 % of tops. Cash receipts present 63 % of revenue. Another part will be paid on 25 of January 2021. Express results in table form (table 16.3). Please take into account that duration of buildings use is 20 years, equipment – 15 years. Analysed period is the first time of fixed assets’ use. The linear method of amortization is used.

Table 16.2 – Initial data

|  |  |
| --- | --- |
| Item | Size |
| Land area, ha | 115 |
| Productivity, c/ha: |  |
| Sugar beet | 28 |
| Tops, % of main product | 50 |
| Bonus, uah/ha | 150 |
| Requirement, kg/ha: |  |
| Seed, kg/ha | 28 |
| Fertilizers (beet/tops), kg/c: |  |
| N | 0.18/0.35 |
| P | 0.09/0.11 |
| K | 0.29/0.59 |
| Labor, man-hour. /ha: |  |
| Own | 5 |
| Employees | 7 |
| Plant protection costs, uah/ha | 160 |
| Variable costs of own mechanization, uah/ha | 245 |
| Land lease costs, uah/ha | 1700 |
| Indirect costs, uah/ha | 150 |
| Buildings value, uah | 1 000 050 |
| Equipment value, uah | 1 523 156 |
| Housing and utilities services (electricity, heeting and water-supply for administrative and farm buildings), uah | 50 000 |
| Water supply (spraying) for production aims, uah/ha | 80 |
| Administrative labor costs, uah | 80 000 |
| Transportation costs, uah/c | 10 |
| Sale costs (advertising, transaction etc), uah/c | 7.87 |
| Storage costs, uah/c | 0.56 |
| Price, uah/kg: |  |
| Sugar beet | 30 |
| Tops | 0.8 |
| Seed | 28 |
| Fertilizers: |  |
| N | 1.1 |
| P | 1.3 |
| K | 0.5 |
| Salary, uah/man-hour. | 25 |
| Opportunity costs, uah/man-hour. | 20 |
| Salary extra charges, % of salary | 21 |
| Current capital: |  |
| Own, % | 85 |
| Attracted (credit with fixed percentage sum), % | 15 |
| Fixed capital: |  |
| Own, % | 55 |
| Attracted (credit with fixed percentage sum), % | 45 |
| Interest rate of assets (capital) use: |  |
| Own, % | 15 |
| Attracted, % | 16 |

Table 16.3 - Example of budget presentation, uah

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Item | Quarter | | | | Year, all |
| 1 | 2 | 3 | 4 |
| A) Financial assets at the beginning of period |  |  |  |  |  |
| Initial status of cash-desk and bank account |  |  |  |  |  |
| B) Receipts |  |  |  |  |  |
| Revenue from sales |  |  |  |  |  |
| Revenue from livestock sale |  |  |  |  |  |
| Unproduction income |  |  |  |  |  |
| Current account credit (10 months) |  |  |  |  |  |
| Total receipts |  |  |  |  |  |
| C) Payments |  |  |  |  |  |
| Seed |  |  |  |  |  |
| Fertilizers |  |  |  |  |  |
| Salary |  |  |  |  |  |
| Livestock purchasing |  |  |  |  |  |
| Credit payments |  |  |  |  |  |
| Personal expenses |  |  |  |  |  |
| Total payments |  |  |  |  |  |
| Surplus (+)/ Sufficiency (-) |  |  |  |  |  |
| Additional requirement of capital |  |  |  |  |  |
| D) Financial assets at the end of period |  |  |  |  |  |
| Eventual status of cash-desk and bank account |  |  |  |  |  |
| Annual total surplus |  |  |  |  |  |

# **Tests for the knowledge control**

|  |  |  |
| --- | --- | --- |
| 1 | Costs for seeds, fertilizers, salary for workers, plant protection measures are: | |
|  | a) | fixed; |
|  | b) | marginal; |
|  | c) | variable; |
|  | d) | listed costs are different types |
| 2 | In case of 0 volume of production, what types of costs will arise? | |
|  | a) | variable; |
|  | b) | both variable and fixed; |
|  | c) | fixed; |
|  | d) | marginal |
| 3 | In case of real price is 67 uah and calculated price for BEP is 52 uah the businessman will receive: | |
|  | a) | profit; |
|  | b) | I don’t know; |
|  | c) | losses; |
|  | d) | there is no exact answer |
| 4 | In case of BEP = 356 uah and your current production volume = 378 uah, the farmer will receive: | |
|  | a) | profit; |
|  | b) | I don’t know; |
|  | c) | losses; |
|  | d) | there is no exact answer |
| 5 | In case of marginal income = - 35 uah and profit = 750 uah, the businessman should: | |
|  | a) | stop the business; |
|  | b) | check the calculation – it is wrong; |
|  | c) | continue the business and analyze BEP; |
|  | d) | be happy, the business is Ok |
| 6 | In case of marginal income = 135 uah and profit = - 750 uah, the businessman should: | |
|  | a) | stop the business; |
|  | b) | check the calculation – it is wrong; |
|  | c) | continue the business and analyze BEP; |
|  | d) | be happy, the business is Ok |
| 7 | In case of marginal income = - 15 uah and profit = - 750, the businessman should: | |
|  | a) | stop the business; |
|  | b) | check the calculation – it is wrong; |
|  | c) | continue the business and analyze BEP; |
|  | d) | be happy, the business is Ok |
| 8 | In case of marginal income = 15 uah and profit = 750 uah, the businessman should: | |
|  | a) | stop the business; |
|  | b) | check the calculation – it is wrong; |
|  | c) | continue the business and analyze BEP; |
|  | d) | be happy, the business is Ok |
| 9 | Point the right formula for BEP calculation: | |
|  | a) | BEP = FC/(p-VC); |
|  | b) | BEP = FC/VC-p; |
|  | c) | BEP = VC/(p-FC); |
|  | d) | BEP = FC/p-VC |
| 10 | Marginal costs show: | |
|  | a) | the increase of costs per additional product; |
|  | b) | the change of fixed costs per additional product; |
|  | c) | the increase of total costs with time; |
|  | d) | there is no right answer |
| 11 | Marginal income show: | |
|  | a) | the increase of income per additional product; |
|  | b) | the change of profit per additional product; |
|  | c) | the increase of total income with time; |
|  | d) | there is no right answer |
| 12 | Cash, inventories, work in progress, buildings and machinery are: | |
|  | a) | current assets; |
|  | b) | liabilities; |
|  | c) | fixed assets; |
|  | d) | these factors of production present different groups of assets |
| 13 | Liabilities in balance sheet include: | |
|  | a) | fixed assets; |
|  | b) | own assets; |
|  | c) | own capital; |
|  | d) | accounts receivables |
| 14 | Current assets in balance sheet include: | |
|  | a) | machinery and equipment; |
|  | b) | own assets; |
|  | c) | own buildings; |
|  | d) | accounts receivables |
| 15 | To describe buildings as assets we should use: | |
|  | a) | initial value; |
|  | b) | current value; |
|  | c) | depreciation; |
|  | d) | all listed |
| 16 | In case of 0 volume of production and total costs = 123 uah, variable costs equal: | |
|  | a) | 0; |
|  | b) | 123; |
|  | c) | 15; |
|  | d) | I need more information to answer |
| 17 | In case of 0 volume of production and total costs = 58 uah, fixed costs equal: | |
|  | a) | 0; |
|  | b) | 58; |
|  | c) | 15; |
|  | d) | I need more information to answer |
| 18 | In case of 0 volume of production and total costs = 73, marginal costs equal: | |
|  | a) | 0; |
|  | b) | 73; |
|  | c) | 15; |
|  | d) | I need more information to answer |
| 19 | Point the right formula for marginal income calculation: | |
|  | a) | MI = Revenue – FC; |
|  | b) | MI = Revenue – VC - FC; |
|  | c) | MI = Revenue – VC; |
|  | d) | MI = Revenue – Price |
| 20 | What can you say about family workers? | |
|  | a) | they receive salary; |
|  | b) | we should analyze the alternative salary to make decision on their use; |
|  | c) | they are officially employed at farm; |
|  | d) | they are good guys and that’s why work at farm |
| 21 | To assess efficiency of resource use and enterprise activity, we use: | |
|  | a) | liquidity analysis; |
|  | b) | profitability analysis; |
|  | c) | stability analysis; |
|  | d) | all listed |
| 22 | To assess the ability of enterprise to pay its debts, we use: | |
|  | a) | liquidity analysis; |
|  | b) | profitability analysis; |
|  | c) | stability analysis; |
|  | d) | analysis of debts |
| 23 | The higher is the share of fixed assets value in total capital, the enterprise… | |
|  | a) | is more stable; |
|  | b) | is less flexible; |
|  | c) | is more flexible; |
|  | d) | is more efficient |
| 24 | What type of planning methods allows to take time into account? | |
|  | a) | static; |
|  | b) | optimization models; |
|  | c) | dynamic; |
|  | d) | time-specific |
| 25 | Dynamic method presupposes use of such operations: | |
|  | a) | discounting; |
|  | b) | time-specific calculations; |
|  | c) | compounding; |
|  | d) | all listed |
| 26 | When making analysis, the horizontal comparison presupposes: | |
|  | a) | the analysis of the similar enterprises; |
|  | b) | the analysis of an enterprise development in time; |
|  | c) | all listed |
| 27 | When the level of fixed assets depreciation is 50% for the last 3 years, it means: | |
|  | a) | that enterprise regularly invests at renovation of fixed assets; |
|  | b) | the fixed assets used are new and there is no necessary to renovate; |
|  | c) | that enterprise should invest at renovation as soon as possible; |
|  | d) | no right answer |
| 28 | If the labor expenses are expressed in time variables (man-hour), so profitability shows: | |
|  | a) | the value that was created for the 1 unit of work; |
|  | b) | the quantity of work, needed to produce 1 uah of value; |
|  | c) | the value, that was created for the 1 unit of capital; |
|  | d) | the value received for the 1 uah spent for the person |
| 29 | If the labor expenses are given in value (uah), so profitability shows: | |
|  | a) | the value, that was created during the 1 unit of work; |
|  | b) | the quantity of work, needed to produce 1 uah of value; |
|  | c) | the value that was created for the 1 unit of total capital; |
|  | d) | the value received for the 1 uah spent for the person |
| 30 | The typical reasons of low profitability at industry (production direction) level are: | |
|  | a) | high fixed costs of mechanization; |
|  | b) | high financial costs; |
|  | c) | inoptimal combination of production industries; |
|  | d) | low nature productivity |
| 31 | The typical reasons of low profitability at enterprise level are: | |
|  | a) | low volume of production; |
|  | b) | high prices due to high costs of sale; |
|  | c) | inoptimal combination of production industries; |
|  | d) | low nature productivity |
| 32 | Indicators of intensity of resource use are calculated as follows: | |
|  | a) | Int = quantity of used resources/output; |
|  | b) | Int = value of resources used/output; |
|  | c) | Int = 1 / profitability; |
|  | d) | all listed |
| 33 | Indicators of profitability of resources use are calculated as follows: | |
|  | a) | Profitability = output / quantity of used resources; |
|  | b) | Profitability = value of used resources / output; |
|  | c) | Profitability = Intensity / 1; |
|  | d) | all listed |
| 34 | The intensity of used resources should: | |
|  | a) | be the same in time; |
|  | b) | decrease in time; |
|  | c) | increase in time; |
|  | d) | it doesn’t matter |
| 35 | The profitability of used resources should: | |
|  | a) | increase with time; |
|  | b) | decrease with time; |
|  | c) | be stable with time; |
|  | d) | it doesn’t matter |
| 36 | If the enterprise doesn’t use the loan capital: | |
|  | a) | it is stable, however, the abilities for further development are limited; |
|  | b) | it is stable and this is good for the enterprise; |
|  | c) | it is not stable; |
|  | d) | I need more information to conclude about the stability |
| 37 | The general approach for liquidity indices calculation: | |
|  | a) | Liquidity = Short-term liabilities / Short-term assets; |
|  | b) | Liquidity = Assets / Short-term liabilities; |
|  | c) | Liquidity = Long-term liabilities / Assets; |
|  | d) | the type of used liabilities depends on the Liquidity type |
| 38 | Cash liquidity as calculated as: | |
|  | a) | (cash + bank account) / short-term liabilities; |
|  | b) | (cash + bank account + inventories + accounts receivables) / short-term liabilities; |
|  | c) | (cash + bank account + accounts receivables) / short-term liabilities; |
|  | d) | (cash + bank account) / liabilities |
| 39 | Short-term liquidity is calculated as: | |
|  | a) | (cash + bank account) / short-term liabilities; |
|  | b) | (cash + bank account + inventories + accounts receivables) / short-term liabilities; |
|  | c) | (cash + bank account + accounts receivables) / short-term liabilities; |
|  | d) | (cash + bank account) / liabilities |
| 40 | Average-term liquidity is calculated as: | |
|  | a) | (cash + bank account) / short-term liabilities; |
|  | b) | (cash + bank account + inventories + accounts receivables) / short-term liabilities; |
|  | c) | (cash + bank account + accounts receivables) / short-term liabilities; |
|  | d) | (cash + bank account) / liabilities |
| 41 | Short-term threshold of credit payments = 35789 uah. It means: | |
|  | a) | this year enterprise is able to pay 35789 uah and less for loans; |
|  | b) | the enterprise is able to pay 35789 uah for loans; |
|  | c) | this year the enterprise is able to pay more than 35789 uah for loans; |
|  | d) | the enterprise is able to get additional loan on 35789 uah |
| 42 | Short-term threshold of credit payments = 35789 uah. The expected payments for loans is 32789 uah. What can you say? | |
|  | a) | It is ok. I could have an additional loan on 3000 uah this year; |
|  | b) | It is ok. I could have an additional loan for 35789 uah; |
|  | c) | It is ok. I could have an additional loan for 32789 uah; |
|  | d) | It is not ok. I can’t pay for my debts |
| 43 | Threshold of credit payments = 125 uah. The expected payments for loans = 95 uah. What is the reserve for credit payments? | |
|  | a) | 95 uah; |
|  | b) | 30 uah; |
|  | c) | 125 uah; |
|  | d) | there is no reserve |
| 44 | The threshold of credit payments for enterprise increases with time. It is… | |
|  | a) | good, the enterprise demonstrates high stability; |
|  | b) | it doesn’t matter for the enterprise stability and progress; |
|  | c) | it is bad, the enterprise should pay more for loans |
| 45 | Why we need to take time into account while planning? | |
|  | a) | due to inflation; |
|  | b) | due to history of economics; |
|  | c) | due to the rule; |
|  | d) | I don’t know |
| 46 | This year farmer will invest 3000 uah into the new business. At the end of second year he will receive 4500 uah. Is it efficient? | |
|  | a) | this project is efficient; |
|  | b) | I need more information to conclude on project’s efficiency; |
|  | c) | this project is not efficient |
| 47 | The comparable marginal income (CMI) of enterprise-plan is calculated as: | |
|  | a) | CMI = TMI + Cs – Cad; |
|  | b) | CMI = TMI – Cad\*Cs; |
|  | c) | CMI = TMI – Cad / Cs; |
|  | d) | CMI = TMI + Cad – Cs |
| 48 | The most popular criterion of financing forms systematization is income of creditor. | |
|  | a) | it is true; |
|  | b) | it is false |
| 49 | Self-financing (profit-based financing) is the main source of agricultural enterprise financing. | |
|  | a) | it is true; |
|  | b) | it is false |
| 50 | The all profit of an enterprise could be used for investing. | |
|  | a) | it is true; |
|  | b) | it is false |
| 51 | The change of assets allows self-financing. | |
|  | a) | it is true; |
|  | b) | it is false |
| 52 | Stocks’ release is the form of internal own financing. | |
|  | a) | it is true; |
|  | b) | it is false |
| 53 | Long-term credits are the cheapest, as usual. | |
|  | a) | it is true; |
|  | b) | it is false |
| 54 | The short-term credit could not be beneficial for a farmer, in any case. | |
|  | a) | it is true; |
|  | b) | it is false |
| 55 | When you decide to use trade credit, you should take into account implicit costs. | |
|  | a) | it is true; |
|  | b) | it is false |

# **Individual work**

# The aim of individual work is to study the issues, that are not included into the basic themes of discipline’s study plan and to control student’s ability to work independently and to use additional literature. Complex tasks for individual work includes theoretical question and practical task. Student must give answers for two theoretical questions and solve the tasks. Feel free while choosing the theoretical questions to answer.

*Theoretical questions for individual work*

1. Give the definition of project and project management.

2. Describe the essence of opportunity costs. Give the examples.

3. Describe the essence and features of marginal analysis.

4. How to determine the optimal production direction?

5. Describe the essence of unpaid labor. Give the examples.

6. Describe the essence of risk assessment. Give the examples of risk cases.

7. What is loan capital? Describe the ways of its attraction.

8. What does the profitability of enterprise depend on?

9. Describe the essence of dynamic planning.

10. Where is the dynamic planning used?

11. What is sensitive analysis?

12. Name the indices of investment efficiency estimation, based on dynamic method of planning.

14. Determine the credit cost elements.

15. Name the features of aggregated production process and aims of aggregation.

16. How to compare different production processes and to choose more effective (basis of comparison)?

17. How to use rules of financing?

18. What is optimized production process?

19. What is optimal production plan?

20. What is entrepreneur’s plan? Name its features.

21. What is consultant’s production plan? Name its features.

22. What are the features of current account credit?

23. What are the features of trade credit?

24. Explain the essence of solvensy and its forms.

25. Describe the scheme of self-financing use.

26. What is the factoring?

27. Describe the form of financing based on stock sale.

28. Explain the principle of profit distribution.

29. Explain the essence of net profit and its features.

30. Explain the principle of internal interest rate estimation.

*Tasks for individual work*

**Task 1.** Calculate the marginal income, profit, profitability of labor use, loan and own capital, using the data shown at Table 1. Make the conclusion about production process economic efficiency. Choose the variant in accordance with last numbers of student’s ticket. The land area is 1000 ha.

Table 17.1 - Initial data (plant growing production process)

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Size | Variant (the last number of student’s card) | | | | | | | | | |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | **7** | **8** | **9** |
| Productivity, c/ha: |  |  |  |  |  |  |  |  |  |  |
| Sugar beet | 28 | 30 | 32 | 29 | 27 | 26 | 31 | 33 | 35 | 28 |
| Tops, % of main product | 50 | 40 | 60 | 70 | 75 | 55 | 65 | 45 | 62 | 56 |
| Bonus, uah/ha | 150 | 180 | 200 | 220 | 300 | 340 | 160 | 180 | 170 | 190 |
| Requirements, kg/ha: |  |  |  |  |  |  |  |  |  |  |
| Seed, kg/ha | 28 | 30 | 32 | 29 | 27 | 26 | 31 | 33 | 35 | 28 |
| Fertilizers (beet/tops), kg/c: |  |  |  |  |  |  |  |  |  |  |
| N | 0.18/0.35 | | | | | | | | | |
| P | 0.09/0.11 | | | | | | | | | |
| K | 0.29/0.59 | | | | | | | | | |
| Labor, man-hour./ha: |  |  |  |  |  |  |  |  |  |  |
| Own | 5 | 7 | 8 | 10 | 11 | 6 | 7 | 8 | 9 | 5 |
| Attracted | 7 | 5 | 3 | 4 | 6 | 5 | 4 | 5 | 6 | 7 |
| Plant protection costs, uah/ha | 160 | 170 | 150 | 155 | 145 | 165 | 180 | 200 | 220 | 250 |
| Fixed costs of own mechanization, uah/ha | 245 | 250 | 255 | 265 | 300 | 225 | 215 | 220 | 210 | 200 |
| Lease area costs, uah/ha | 400 | 450 | 455 | 465 | 470 | 425 | 400 | 455 | 460 | 450 |
| Indirect costs, uah/ha | 50 | 60 | 70 | 75 | 65 | 55 | 45 | 50 | 60 | 70 |
| Size | Variant (the penultimate number of student’s card) | | | | | | | | | |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | **7** | 8 | 9 |
| Price, uah/kg: |  |  |  |  |  |  |  |  |  |  |
| Sugar beet | 4 | 5 | 6 | 4 | 5 | 3.5 | 2.8 | 4.5 | 6.5 | 7.6 |
| Tops | 0.8 | 1.2 | 0.9 | 0.7 | 0.8 | 0.6 | 0.6 | 0.7 | 1.2 | 1.1 |
| Seed | 3 | 4 | 5 | 4 | 4 | 3 | 2 | 4 | 5 | 5 |
| Fertilizers: |  |  |  |  |  |  |  |  |  |  |
| N | 1.1 | 1.2 | 1.1 | 0.9 | 1 | 0.85 | 1.1 | 1.2 | 1.3 | 1.4 |
| P | 1.3 | 1.3 | 1.2 | 1.1 | 1.1 | 1.2 | 1.3 | 1.4 | 1.5 | 1.1 |
| K | 0.5 | 0.5 | 0.6 | 0.4 | 0.45 | 0.5 | 0.55 | 0.65 | 0.7 | 0.5 |
| Salary, uah/man-hour.: | 15 | 20 | 15 | 20 | 15 | 20 | 15 | 18 | 17 | 16 |
| Opportunity costs, uah/man-hour | 20 | 15 | 15 | 22 | 16 | 17 | 18 | 19 | 20 | 15 |

**Task 2.** Range production processes by their relative advantages. Make the conclusion. Choose the variant of initial data in accordance with number in students list.

Table 17.2 - Initial data (Variant 1)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Production process | Unit of estimation | Sum of reimbursement, uah | Requirement of factors | | | |
| Land, ha | Cattle-places | Work, man-hours | Basic forage,  kStU |
| Grain | 1 ha | 1000 | 1 |  | 12 |  |
| Feed | 1 ha | -500 | 1 |  | 14 | 5000 |
| Dairy cow | 1 cow | 2850 |  | 1.1 | 54 | -2500 |
| Bulls | 1 bull | 1050 |  | 1.3 | 17 | -1667 |
| Capacity |  |  | 5000 | 3500 | 200000 |  |

Table 17.3 - Initial data (Variant 2)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Production process | Unit of estimation | Sum of reimbursement, uah | Requirement of factors | | | |
| Land, ha | Cattle-places | Work, man-hours | Basic forage,  kStU |
| Grain | 1 ha | 2000 | 1 |  | 12 |  |
| Feed | 1 ha | -600 | 1 |  | 14 | 5000 |
| Dairy cow | 1 cow | 2750 |  | 1.3 | 53 | -2500 |
| Bulls | 1 bull | 1050 |  | 1.1 | 17 | -1667 |
| Capacity |  |  | 5000 | 3500 | 200000 |  |

Table 17.4 - Initial data (Variant 3)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Production process | Unit of estimation | Sum of reimbursement, uah | Requirement of factors | | | |
| Land, ha | Cattle-places | Work, man-hours | Basic forage,  kStU |
| Grain | 1 ha | 1000 | 1 |  | 11 |  |
| Feed | 1 ha | -500 | 1 |  | 14 | 5000 |
| Dairy cow | 1 cow | 2750 |  | 1.2 | 53 | -2500 |
| Bulls | 1 bull | 1150 |  | 1.3 | 17 | -1667 |
| Capacity |  |  | 5000 | 3500 | 200000 |  |

Table 17.5 - Initial data (Variant 4)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Production process | Unit of estimation | Sum of reimbursement, uah | Requirement of factors | | | |
| Land, ha | Cattle-places | Work, man-hours | Basic forage, kStU |
| Grain | 1 ha | 1000 | 1 |  | 12 |  |
| Feed | 1 ha | -500 | 1 |  | 14 | 5000 |
| Dairy cow | 1 cow | 2750 |  | 1.1 | 53 | -2500 |
| Bulls | 1 bull | 1050 |  | 1.3 | 17 | -1667 |
| Capacity |  |  | 5000 | 3500 | 200000 |  |

Table 17.6 - Initial data (Variant 5)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Production process | Unit of estimation | Sum of reimbursement, uah | Requirement of factors | | | |
| Land, ha | Cattle-places | Work, man-hours | Basic forage, kStU |
| Grain | 1 ha | 1200 | 1 |  | 12 |  |
| Feed | 1 ha | -500 | 2 |  | 14 | 5000 |
| Dairy cow | 1 cow | 2850 |  | 1.2 | 53 | -2500 |
| Bulls | 1 bull | 1050 |  | 1.2 | 17 | -1667 |
| Capacity |  |  | 5000 | 3500 | 200000 |  |

# **Glossary**

# **Agricultural area** – Any area taken up by arable land, permanent grassland or permanent crops.

# **Opportunity costs** – A benefit, profit, or value of something that must be given up to acquire or achieve something else. Since every resource (land, money, time, etc.) can be put to alternative uses, every action, choice, or decision has an associated opportunity cost. Opportunity costs are fundamental costs in economics, and are used in computing cost benefit analysis of a project. Such costs, however, are not recorded in the account books but are recognized in decision making by computing the cash outlays and their resulting profit or loss.

# **Analysis** – 1. A systematic examination and evaluation of data or information, by breaking it into its component parts to uncover their interrelationships. Opposite of synthesis. 2. An examination of data and facts to uncover and understand cause-effect relationships, thus providing basis for problem solving and decision making.

# Assets – Anything owned by the company having a monetary value; eg, 'fixed' assets like buildings, plant and machinery, vehicles (these are not assets if rentedand not owned) and potentially including intangibles like trade marks and brand names, and 'current' assets, such as stock, debtors and cash.

# **Balance sheet** – The Balance Sheet is one of the three essential measurement reports for the performance and health of a company along with the Profit and Loss Account and the Cashflow Statement. The Balance Sheet is a 'snapshot' in time of who owns what in the company, and what assets and debts represent the value of the company. (It can only ever nbe a snapshot because the picture is always changing.) The Balance Sheet is where to look for information about short-term and long-term debts, gearing (the ratio of debt to equity), reserves, stock values (materials and finsished goods), capital assets, cash on hand, along with the value of shareholders' funds. The term 'balance sheet' is derived from the simple purpose of detailing where the money came from, and where it is now. The balance sheet equation is fundamentally: (where the money came from) Capital + Liabilities = Assets (where the money is now). Hence the term 'double entry' - for every change on one side of the balance sheet, so there must be a corresponding change on the other side - it must always balance. The Balance Sheet does not show how much profit the company is making (the P&L does this), although pervious years' retained profits will add to the company's reserves, which are shown in the balance sheet.

# **Budget** – In a financial planning context the word 'budget' (as a noun) strictly speaking means an amount of money that is planned to spend on a particularly activity or resource, usually over a trading year, although budgets apply to shorter and longer periods. An overall organizational plan therefore contains the budgets within it for all the different departments and costs held by them. The verb 'to budget' means to calculate and set a budget, although in a looser context it also means to be careful with money and find reductions (effectively by setting a lower budgeted level of expenditure). The word budget is also more loosely used by many people to mean the whole plan. In which context a budget means the same as a plan. For example in the UK the Government's annual plan is called 'The Budget'. A 'forecast' in certain contexts means the same as a budget - either a planned individual activity/resource cost, or a whole business/ corporate/organizational plan. A 'forecast' more commonly (and precisely in my view) means a prediction of performance - costs and/or revenues, or other data such as headcount, % performance, etc., especially when the 'forecast' is made during the trading period, and normally after the plan or 'budget' has been approved. In simple terms: budget = plan or a cost element within a plan; forecast = updated budget or plan. The verb forms are also used, meaning the act of calculating the budget or forecast.

# **Capital** – The physical equipment (buildings, equipment, human skills) used in the production of goods and services. Also used to refer to corporate equity, debt securities, and cash.

# **Capital employed** – The value of all resources available to the company, typically comprising share capital, retained profits and reserves, long-term loans and deferred taxation. Viewed from the other side of the balance sheet, capital employed comprises fixed assets, investments and the net investment in working capital (current assets less current liabilities). In other words: the total long-term funds invested in or lent to the business and used by it in carrying out its operations.

# **Capital good** – A good that is a manufactured (or previously produced) factor of production that is used to manufacture or produce other things. Common examples of capital goods re the factories, buildings, trucks, tools, machinery, and equipment used by businesses in their productive pursuits. The acquisition of capital goods is the primary goal of business investment.

# **Cashflow** – The movement of cash in and out of a business from day-to-day direct trading and other non-trading or indirect effects, such as capital expenditure, tax and dividend payments.

# **Cashflow statement** – One of the three essential reporting and measurement systems for any company. The cashflow statement provides a third perspective alongside the Profit and Loss account and Balance Sheet. The Cashflow statement shows the movement and availability of cash through and to the business over a given period, certainly for a trading year, and often also monthly and cumulatively. The availability of cash in a company that is necessary to meet payments to suppliers, staff and other creditors is essential for any business to survive, and so the reliable forecasting and reporting of cash movement and availability is crucial.

# **Control** – A management function aimed at achieving defined goals within an established timetable, and usually understood to have three components: (1) setting standards, (2) measuring actual performance, and (3) taking corrective action. A typical process for management control includes the following steps: (1) actual performance is compared with planned performance, (2) the difference between the two is measured, (3) causes contributing to the difference are identified, and (4) corrective action is taken to eliminate or minimize the difference.

# **Costs** – An amount that has to be paid or given up in order to get something. In business, cost is usually a monetary valuation of (1) effort, (2) material, (3) resources, (4) time and utilities consumed, (5) risks incurred, and (6) opportunity forgone in production and delivery of a good or service. All expenses are costs, but not all costs (such as those incurred in acquisition of an income-generating asset) are expenses.

# **Credit** – 1. A contractual agreement in which a borrower receives something of value now and agrees to repay the lender at some date in the future, generally with interest. The term also refers to the borrowing capacity of an individual or company. 2. An accounting entry that either decreases assets or increases liabilities and equity on the company's balance sheet. On the company's income statement, a debit will reduce net income, while a credit will increase net income.

# **Debt** – An amount of money borrowed by one party from another. Many corporations/individuals use debt as a method for making large purchases that they could not afford under normal circumstances. A debt arrangement gives the borrowing party permission to borrow money under the condition that it is to be paid back at a later date, usually with interest.

# **Depreciation** – A more or less permanent decrease in value or price. "More or less permanent" doesn't include temporary, short-term drops in price that are common in many markets. It's only those price declines that reflect a reduction in consumer satisfaction. While all sorts of stuff can depreciate in value, some of the more common ones are capital, real estate, corporate stock, and money. The depreciation of capital results from the rigors of production and affects our economy's ability to produce stuff. A sizable portion of our annual investment is thus needed to replace depreciated capital. The depreciation of a nation's money is seen as an increase in the exchange rate. This process is described in detail in the entry on the J curve.

# **Discount** – The amount by which a preferred stock or bond may sell below its par value. Also used as a verb to mean "takes into account" as the price of the stock has discounted the expected dividend cut.

# **Dividend** – A dividend is a payment made per share, to a company's shareholders by a company, based on the profits of the year, but not necessarily all of the profits, arrived at by the directors and voted at the company's annual general meeting. A company can choose to pay a dividend from reserves following a loss-making year, and conversely a company can choose to pay no dividend after a profit-making year, depending on what is believed to be in the best interests of the company. Keeping shareholders happy and committed to their investment is always an issue in deciding dividend payments. Along with the increase in value of a stock or share, the annual dividend provides the shareholder with a return on the shareholding investment.

# **Employee** – An individual who works part-time or full-time under a contract of employment, whether oral or written, express or implied, and has recognized rights and duties. Also called worker.

# **Factors of production** – The four basic factors used to produce goods and services in the economy--labor, capital, land, and entrepreneurship. These are also called resources or scarce resources. The term "factors of production" is quite descriptive of the function these "resources" perform. Labor, capital, land, and entrepreneurship are the four "factors" or items use in the "production" of goods and services. So there you have it "factors" of "production."

# **Fixed assets** – Assets held for use by the business rather than for sale or conversion into cash, eg, fixtures and fittings, equipment, buildings.

# **Fixed cost** – A cost which does not vary with changing sales or production volumes, eg, building lease costs, permanent staff wages, rates, depreciation of capital items. In general, cost that does not change with changes in the quantity of output produced. More specifically, fixed cost is combined with the adjectives "total" and "average" to indicate the overall level of fixed cost or the per unit fixed cost. Fixed cost is incurred whether of not any output is produced. The same fixed cost is incurred at any and all output levels. This means that total fixed cost is, in fact, FIXED. However, it also means that average fixed cost, or fixed cost per unit, declines as the output level increases. Spreading out $100 over 1,000 units gives a lower per unit fixed cost that spreading out $100 over 10 units.

# **Fixed factor of production** – An input whose quantity cannot be changed in the time period under consideration. This usually goes by the shorter term fixed input and should be immediately compared and contrasted with variable factor of production, which goes by the shorter term variable input. The most common example of a fixed factor of production is capital. A fixed factor of production provides the "capacity" constraint for the short-run production of a firm. As larger quantities of a variable factor of production, like labor, are added to a fixed factor of production like capital, the variable input becomes less productive. This is, by the way, the law of diminishing marginal returns. For more detailed discussion, take a look at the shorter, more commonly used alias of fixed factor of production, which is fixed input.

# **Goods** – When used without an adjective modifier (like "final" goods or "intermediate" goods), this generically means physical, tangible products used to satisfy people's wants and needs. This term good should be contrasted with the term services, which captures the intangible satisfaction of wants and needs. As such, you will frequently see the plural combination of these two phrases together "goods and services" to indicate the wide assortment of economic goods produced using the economy's scarce resources. As you might imagine this general notion of wants and needs satisfying goods and services pops up throughout the study of economics.

# **Gross profit** – Sales less cost of goods or services sold. Also referred to as gross profit margin, or gross profit, and often abbreviated to simply 'margin'. See also 'net profit'.

# **Income** – Revenue earned or received by households that can be used for consumption or saving. For the aggregate economy, earned income is termed national income, while received income is termed personal income. The key is that income for the aggregate economy is generated in the production of goods and services.

# **Input** – The resources or factors of production used in the production of a firm's output.

# **Investment** – The purchase of a security, such as a stock or bond. The use of money for the purpose of making more money, to gain income, increase capital, or both.

# **Land** – One of four basic categories of resources, or factors of production (the other three are labor, capital, and entrepreneurship). This category includes the natural resources used to produce goods and services, including the land itself; the minerals and nutrients in the ground; the water, wildlife, and vegetation on the surface; and the air above.

# **Liabilities** – General term for what the business owes. Liabilities are long-term loans of the type used to finance the business and short-term debts or money owing as a result of trading activities to date . Long term liabilities, along with Share Capital and Reserves make up one side of the balance sheet equation showing where the money came from. The other side of the balance sheet will show Current Liabilities along with various Assets, showing where the money is now.

# **Limited resources** – Finite quantities of labor, capital, land, and entrepreneurship available to an economy for the production of goods and services. This is one half of the fundamental problem of scarcity that has plagued humanity since the beginning of time. The other half of the scarcity problem is unlimited wants and needs.

# **Liquidity** – The ability to quickly convert an investment portfolio to cash without suffering a noticeable loss in value. Stocks and bonds of widely traded companies are considered highly liquid. Real estate and limited partnerships are illiquid.

# **Liquidity ratio** – Indicates the company's ability to pay its short term debts, by measuring the relationship between current assets (ie those which can be turned into cash) against the short-term debt value. (current assets/current liabilities) Also referred to as the Current Ratio.

# **Loan** – In general, a transaction in which a legal claim is exchanged for money. The legal claim is typically a contract or promissory note stipulating when and how the money will be repaid. The lender gives up the money and receives the legal claim. The borrower gives up the legal claim and receives the money. A loan can be either an asset or a liability, depending on who does the borrowing and who does the lending. To the borrower, a loan is a liability, something that is owed. The borrower must pay off the loan or repurchase the legal claim. However, to the lender, a loan is an asset, something that is owned. In fact, loans represent a significant part of a bank's assets.

# **Marginal analysis** – A basic technique used in the economics that analyzes small, incremental changes in key variables. The economic obsession with marginal changes exists for at least two reasons. One reason is that many economic decisions made in the real world are made "at the margin." A second reason for using marginal analysis can best be termed analytical sophistication.

# **Marginal cost and marginal product** – Because variable cost is largely associated with the cost of employing a variable input in the short run, it's possible to identify a connection between the marginal cost curve and the marginal product curve. In particular, the quantity of output in which marginal cost is at a minimum, is the same quantity of output produced by the variable input when the marginal product of the variable input is at a maximum. In addition, over the range of production in which the variable input experiences increasing marginal returns and marginal product increases, the marginal cost curve declines. And over the range of production in which the variable input experiences decreasing marginal returns brought on by the law of diminishing marginal returns and marginal product increases, the marginal cost curve is rising.

# **Marginal cost** – The change in total cost (or total variable cost) resulting from a change in the quantity of output produced by a firm in the short run. Marginal cost indicates how much total cost changes for a give change in the quantity of output. Because changes in total cost are matched by changes in total variable cost in the short run (remember total fixed cost is fixed), marginal cost is the change in either total cost or total variable cost. Marginal cost, usually abbreviated MC, is found by dividing the change in total cost (or total variable cost) by the change in output.

# **Marginal value** – The incremental value that is achieved through additional output. Marginal value exists through a product modification that results in an increase in price or an increase in unit production. The value is calculated by subtracting additional input costs from the unit price of the additional output.

# **Needs** – This are often thought of as a physiological or biological requirement for maintaining life, such as the need for air, water, food, shelter, and sleep. Satisfaction is achieved by fulfilling needs. Physiological needs should be contrasted with psychological wants that make life more enjoyable but are not necessary to stay alive. However, when push comes to shove, and the nitty gets down to the gritty, it matters very little to markets if people need goods or want goods, so long as they are motivated to satisfy them. This motivation is what drives economic activity.

# **Net income** – A common term for profit, as the difference between total revenue and total cost. When used in the real world of business wheeling and dealing, this notion of net income general refers to accounting profit rather than economic profit. The "net" aspect of net income indicates that some (that something being cost) is deducted from total or "gross" income. Other common terms used in this same context are net revenue and net earnings.

# **Net profit** – Net profit can mean different things so it always needs clarifying. Net strictly means 'after all deductions' (as opposed to just certain deductions used to arrive at a gross profit or margin). Net profit normally refers to profit after deduction of all operating expenses, notably after deduction of fixed costs or fixed overheads. This contrasts with the term 'gross profit' which normally refers to the difference between sales and direct cost of product or service sold (also referred to as gross margin or gross profit margin) and certainly before the deduction of operating costs or overheads. Net profit normally refers to the profit figure before deduction of corporation tax, in which case the term is often extended to 'net profit before tax' or PBT.

# **Optimization** – Finding an alternative with the most cost effective or highest achievable performance under the given constraints, by maximizing desired factors and minimizing undesired ones. In comparison, maximization means trying to attain the highest or maximum result or outcome without regard to cost or expense. Practice of optimization is restricted by the lack of full information, and the lack of time to evaluate what information is available (see bounded reality for details). In computer simulation (modeling) of business problems, optimization is achieved usually by using linear programming techniques of operations research.

# **Output** – A generic term for a tangible good or an intangible service that is the end result of the production/resource transformation process. This notion of output, which also goes by the alias product, usually surfaces in the context of analyzing the short-run production of a firm. The short-run relation between a variable input and output is of particular interest because it reveals the law of diminishing marginal returns. This law indicates that additional quantities of a variable input, when added to a fixed input, have decreasing marginal products, or marginal returns.

# **Planning process** – The development of goals, strategies, task lists and schedules required to achieve the objectives of a business. The planning process is a fundamental function of management and should result in the best possible degree of need satisfaction given the resources available.

# **Production cost** – The opportunity cost of using labor, capital, land, and entrepreneurship in the production of goods and services. Production cost is important to supply. The price received by a seller must be great enough to cover production cost. Note that production cost includes what you probably think of as the traditional "cost of doing business," but it includes other less obvious costs, as well. While labor, capital, and land typically involve an explicit cost--an actual money payment--the cost of entrepreneurship is often an implicit cost. In particular, the cost of entrepreneurship is termed normal profit.

# **Production inputs** – The resources, or factors of production, used in the production of output by a firm. This term is most frequently associated with the analysis of short-run production, and is often modified by the terms fixed and variable, as in fixed input and variable input. The quantity of a variable input can be changed in the short run and the quantity of a fixed input cannot be changed.

# **Production** – The process of transforming the natural resources of the land into consumer satisfying consumption and capital goods using scarce resources. In a world of scarcity, with unlimited wants and needs and limited resources, living standards are enhanced by transforming the planet's raw materials, that don't provide much satisfaction in their natural state, into goods, that provide more satisfaction.

# **Productivity** – The ratio of output (goods and services) produced per unit of input (productive resources) over some period of time.

# **Profit** – As a generic term, this is the difference between revenue and cost. There are, however, three specific sorts of profit, each with a different meaning. Accounting profit is the difference between revenue and accounting expenses. Economic profit is the difference between revenue and the opportunity cost of production. Normal profit is the economic profit that could be earned by an entrepreneur in another business and is thus an opportunity cost deducted from revenue when calculating economic profit.

# **Profitability** – The state or condition of yielding a financial profit or gain. It is often measured by price to earnings ratio.

# **Quantity** – In a market, the amount of a good that is bought, sold, or traded among buyers and sellers. In a standard market diagram, quantity is displayed on the horizontal axis.

# **Quota** - An imposed limit on the quantity of goods produced or purchased. Import quota can be used to restrict the purchases of goods from foreign origins.

# **Raw materials** – The stuff used in the production of tangible products that become the tangible products. Raw materials, also shorted to just materials, are part of the land category of scarce resources. Space is also part of the land resource category. Another term that works as a synonym for materials is natural resources. Perhaps it's obvious that without materials, there would be no tangible products.

# **Requirement** – 1) This is often thought of as a physiological or biological need for maintaining life, such as the need for air, water, food, shelter, and sleep. Satisfaction is achieved by fulfilling needs. Physiological needs should be contrasted with psychological wants that make life more enjoyable but are not necessary to stay alive. However, when push comes to shove, and the nitty gets down to the gritty, it matters very little to markets if people need goods or want goods, so long as they are motivated to satisfy them. This motivation is what drives economic activity. 2) Requirements are descriptions of how a product or service should act, appear, or perform. Requirements generally refer to the features and functions of the deliverables you are building on your project. Requirements are considered to be a part of project scope. High-level scope is defined in your project definition (charter). The requirements form the detailed scope. After your requirements are approved, they can be changed through the scope change management process.

# **Resources** – Everything needed to complete the project, but in particular people and money. The labor, capital, land, and entrepreneurship used by society to produce consumer satisfying goods and services. Land provides the basic raw materials--vegetation, animals, minerals, fossil fuels--that are inputs into the production of goods (natural resources). Labor is the resource that does the "hands on" work of transforming raw materials into goods. Capital is the comprehensive term for the vast array of tools, equipment, buildings, and vehicles used in production. Entrepreneurship is the resource that undertakes the risk of bringing the other resources together and initiating the production process.

# **Risk** – There may be potential external events that will have a negative impact on your project if they occur. Risk refers to the combined likelihood the event will occur and the impact on the project if the event does occur. If the combined likelihood of the event happening and impact to the project are both high, you should identify the potential event as a risk and put a plan in place to manage it.

# **Salary** – Agreed-upon and regular compensation for employment that may be paid in any frequency but, in common practice, is paid on monthly and not on hourly, daily, weekly, or piece-work basis.

# **Services** – Activities that provide direct satisfaction of wants and needs without the production of tangible products or goods. Examples include information, entertainment, and education. This term service should be contrasted with the term good, which involves the satisfaction of wants and needs with tangible items. You're likely to see the plural combination of these two into a single phrase, "goods and services," to indicate the wide assortment of economic production from the economy's scarce resources. Economic activities -- such as transportation, banking, insurance, tourism, telecommunications, advertising, entertainment, data processing, and consulting -- that normally are consumed as they are produced, as contrasted with economic goods, which are more tangible.

# **Stability** – Ability of a substance to remain unchanged over time under stated or reasonably expected conditions of storage and use. Usually the conditions that may cause instability (such as humidity, shock, or temperature) are identified in the MSDS for the substance.

# **Supply** – A schedule of how much producers are willing and able to sell at all possible prices during some time period.

# **Tax** – Compulsory monetary contribution to the state's revenue, assessed and imposed by a government on the activities, enjoyment, expenditure, income, occupation, privilege, property, etc., of individuals and organizations. Any sort of forced or coerced payment to government. The primary reason government collects taxes is to get the revenue needed to finance public goods and pay administrative expenses. However, the more astute leaders of the first estate have recognized over the years that taxes have other effects, including--(1) redirecting resources from one good to another and (2) altering the total amount of production in the economy. As such, taxes have been used to correct market failures, equalize the income distribution, achieve efficiency, stabilize business cycles, and promote economic growth.

# **Total cost** – The opportunity cost incurred by all of the factors of production used by a firm to produce of a good or service, including wages paid to labor, rent paid for the land, interest paid to capital owners, and a normal profit paid to entrepreneurs. Total cost is most important in the analysis a firm's short-run production decision and is frequently separated into total variable cost and total fixed. cost.

# **Value** – Quite simply, this is the amount of consumer satisfaction directly or indirectly obtained from a good. service, or resource. The more a good satisfies a person's want or need, then the more valuable it is to that person. Furthermore, different people are likely to place different values on a good. Resources are valuable to the degree that they are used to produce stuff that consumers want. The bottom line is that value, like beauty, is truly in the eye of the beholder.

# **Variable cost** – In general, cost that changes with changes in the quantity of output produced. More specifically, variable cost is combined with the adjectives "total" and "average" to indicate the overall level of variable cost or the per unit variable cost. Variable cost depends on the amount of produced. If there is no production, then there is no variable cost.

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