МИНИСТЕРСТВО НАУКИ И ВЫСШЕГО ОБРАЗОВАНИЯ РОССИЙСКОЙ ФЕДЕРАЦИИ
ФЕДЕРАЛЬНОЕ ГОСУДАРСТВЕННОЕ БЮДЖЕТНОЕ ОБРАЗОВАТЕЛЬНОЕ УЧРЕЖДЕНИЕ ВЫСШЕГО ОБРАЗОВАНИЯ «РОССИЙСКИЙ ЭКОНОМИЧЕСКИЙ УНИВЕРСИТЕТ ИМ. Г.В. ПЛЕХАНОВА»

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Sustainable finance department

COURSE PROJECT

on discipline **«Investment analysis and investment project management»**

Topic: «Formation of an investment program»

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INTRODUCTION

In the modern economic science, the topic of formation of an investment program is quite important and widely-researched as it plays a crucial role in achieving strategic goals of a company. Consistent growth of a company depends on such factors as precise investment strategy development, definition of its most important directions and mobilization of all the sources of investing.

Overall, effective investment program assures that the company is able to overcome general market instability as well as local industry crises while maintaining necessary level of economic growth. As investing activity is difficult to predict and taking into account its general importance for the company, it can be said that the process of investment program formation and implementation needs to be precisely controlled.

The purpose of this course project is to form an investment portfolio of a company and analyze the effectiveness of its implementation.

The tasks of this course work are:

1. To define the essence of investment in the economic activity of the company.
2. Study methodological approaches to the development of an investment program.
3. Give general conclusions of the economic state of the company and its investment management in terms of its optimization.
4. Give and test the recommendations on improving the efficiency of an investment program of a company.

The object of the research is PJSC “ PhosAgro”. The subject of this research is the system of formation and management of investment policy of PJSC“ PhosAgro”.

In the first chapter of this course project the theoretical aspects of formation of an investment program will be presented and analyzed. In the second chapter the overall economic stability of the company will be analyzed by the means of financial ratios in order to determine the areas to improve, and the investment management of the company will be studied as well. In the third chapter the recommendations

for the optimization of an investment program of a company will be given and evaluated.

Grouping, comparison, induction and deduction methods were used as tools.

The information base of the study are the financial statements of PJSC "PhosAgro".

CHAPTER 1. THEORETICAL FOUNDATIONS OF THE ORGANIZATION'S INVESTMENT PROGRAM FORMATION

1.1 The essence and content of the concept of "investment activity" of the organization

Investment activity is the activity of making investments and carrying out practical actions in order to make a profit or achieve another useful effect.[1] In general, there are various definitions of the term “investment activity” as a result of the heterogeneity of scientist’s approaches in defining the object of investment activity as well as determining whether it is a static or a dynamic event. Here are some examples of them:

1. Investment activity is the investment of capital in monetary, tangible and intangible forms in business objects in order to obtain current income or ensure an increase in its value in the future.[2]
2. Investment activity in a broad sense should be understood as money, property and intellectual values of the state, individuals, directed to the creation of new enterprises, expansion, reconstruction and technical re-equipment of existing ones, the acquisition of real estate, shares, bonds and other securities and assets in order to make a profit or other positive effect.[3]
3. Investment activity are investments of savings of all participants of the economic system both in objects of entrepreneurial and other types of activity, and in securities and other assets in order to derive income (profit) or achieve a positive (social) effect.[4]

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[1] Federal Law No. 39-FZ of 25.02.1999 (as amended on 12.12.2021) "On Investment Activities in the Russian Federation, Carried Out in the Form of Capital Investments"

[2] Blank I.A. Osnovy finansovoy menedzheniya [Fundamentals of financial management]. Moscow, Omega-L Publ., 2021. – p. 203.

[3] Sergeev I.V., Veretennikova I.I. Ekonomika organizatsii: uchebnik [Economics of organizations: textbook]. Moscow, 2020. 560 p.

[4] M.Y. Makovetsky, Investments as a key factor of economic growth. – 2020. – No 4.

4. Investments are a set of expenditures realized in the form of purposeful investment of capital for a certain period of time in various sectors and spheres of the economy, in objects of entrepreneurial and other types of activity to obtain profit (income) and achieve both individual goals of investors and a positive social effect.[5]
5. Investment is the expenditure of money or other funds in the present in anticipation of future benefits.[6]

As it follows from the stated above definitions, scientists define investment activity either as a totality of costs incurred or as capital investment, and their approach is not entirely correct as it excludes the dynamic aspect of the term by highlighting only one of the elements of investment activity and prioritize separate stages. It is needed to consider investment activity holistically, as a process in the course of which the change in the forms of value occurs as well as the connection between the elements of investment.

Moreover, the result of investment activity is not always making a profit but also achievement of positive social, innovative ecological effect. Equation of capital expenditures with investment is not precise, as this term is narrower. Investment is not only reproduction of fixed assets, but also development of informational resources, creation of new enterprises, acquisition of intangible assets.

Thus, it can be concluded that investment activity is precisely studied, yet there are differences in approaches which are calling for systematization and formation of united conceptual apparatus. So, the essence of investment activity can be formed the following way:

Investment activity plays an important role both on macroeconomic and microeconomic levels, they define the economic future of the country in general and separate business entities in particular. In terms of a company, investment activity is

[5] Investments: textbook / G.P. Podshivalenko, N.I. Lakhmetkina, M.V. Makarova. Moscow, KNORUS Publ., 2022. – 200 p. 3 Bodie Z.,

[6] Bodie, Z., Kane, A., Marcus, A. Principles of Investment. Moscow, Williams Publ., 2020. 984 p.

closely connected with formation of an investment program, which leads to the creation of an investment portfolio. Investment portfolio in general consists of investments in securities, real investment portfolio, portfolio of investments in the organization's working capital.[7]

To maintain investment activity effectively, companies need to create an investment policy, which is a set of measures that are entitled to ensure favorable investment of own, borrowed and other funds in order to ensure the stable financial stability of the organization's work in the short and long term.

The following principles act as a base of creation of an investment policy:

1) strategic orientation on the financial stability of a company;
2) accounting for inflation and risk factor;
3) economic justifications of investments;
4) achieving a balance between portfolio and real investments;
5) ranking investment projects in accordance with their importance and current amount of recourses.[8]

The implementation of the stated above principles as well as the others ensures the effectiveness of an investment policy of the company's as well as its investment projects.

Investment projects are the main form of realization of real investments. In the resent years, the form of project financing from banks has increased in spreading, which solves the problem of the decrease of real investment. The implementation of an investment project requires long-term planning and analysis with the addition of time factor. Creation of an investment project also ensures the possibility of getting the government participation in for projects that meet its socio-economic needs.

Innovative investments are crucial for the development of the company, as they ensure its future and competitiveness. Moreover, by directing them into favorable to the government directions, companies can receive its support, which makes them preferable to implement nowadays. Innovative investments represent investments

[7] Investment Portfolio, CFI article URL:https://corporatefinanceinstitute.com/resources/career-map/sell-side/capital-markets/investment-portfolio/(accessed: 06.05.2024)
[8] Napa Valley Wealth Management. "Investment Policy Statement Sample," Page 2.

in intangible assets and ensure the introduction of scientific and technical developments in production and the social sphere, i.e. investments in innovations leading to quantitative and qualitative improvements.[9]

Overall, investment activity of the company is a form of involvement of accumulated capital in the economic process, while capital is used in all its alternative forms and invested in any objects of entrepreneurial and other activity, in various sectors and spheres of the economy. Investment activity plays a crucial role for the company in terms of strategic economic growth and stability as well as in the interactions with the government.

Assessing the effectiveness of investments, significant attention is paid to the problems of accounting for inflation, risk and uncertainty, their quantitative assessment and consideration of the organizational and economic mechanism for their prevention and reduction.[10]

1.2 Methodological approaches to the development of the organization's investment program

It was stated above that there are certain principles based on which companies create their investment programs. There are also certain approaches on assessing the effectiveness of an investment program and accounting various factors that influence its implementation. Based on the stated above principles the following algorithm to form an investment program can be proposed:

1. Selection the main criterion to form an investment program.
2. Differentiation of quantitative values of the main selection criterion by types of investment projects.
3. Building a system of restrictions on the selection of investment projects.

[9] Grimaldi, M., Corvello, V., De Mauro, A. et al. A systematic literature review on intangible assets and open innovation. Knowl Manage Res Pract 15, 90–100 (2017).

[10] Xie, Y. and Lin, C. (2023) 'The impact of investment strategies and sustainable development goals on organizational effectiveness: mediating role of organizational climate', *Economic Research-Ekonomska Istraživanja*, 36(1).

4. Ranging of investment projects.
5. Formation of an investment program applying the restrictions of operational activity indicators.
6. Formation of an investment program with a restriction of weighted average cost of investment resources.
7. Formation of an investment program with the lack of overall investment resources.
8. Assessment of an investment program.

In addition with the following algorithm there are also various models of optimization and implementations of investing programs. For example:

1. Dean's Model

The essence of this model consists of constructing the graphs of the cost of capital and internal norm of projects' profitability.[11] The optimal volume of an investment program is reached in the point of interception of those graphs.

2. G. Albach's model

On the contrary to the previous model, Albach's allows taking into account the efficiency of the project and the budget constraint at the same time.[12] However, as in Dean's model, investment projects are evaluated by only one criterion.

The objective function is formulated as follows:

$$maxC = \Sigma c_j * M_j + \Sigma v_i * Y_i \qquad 1.1$$

Where C is net present value from the implementation of the program; c_j is the net present value of the project; M_j is the number of projects with j-th net present income; v_i is the profitability of using the first form of financing; Y_i is the amount of funds raised with the help of the i-th form of financing.[13]

Budgetary restrictions are set as follows:

[11] Journal of Business Economics (2022) 92:159–161
[12] Journal of Business Economics (2022) 92:159–161
[13] Journal of Business Economics (2022) 92:159–161

$$\Sigma\Sigma at_j * M_j + \Sigma\Sigma dt_i * Y_j < \Sigma L_t \quad (1.2)$$

Compliance with this condition ensures that for all periods $t = 1$, t accumulated negative cash flows (at_j) of the relevant projects and the costs associated with the use of the relevant financial instruments (dt_i) will not exceed the available amount of liquidity (L_t).

In general, formation of an investment program of an enterprise is an extremely complicated process that requires a multi-step algorithm implementation and various methods of analysis. To conduct it properly, the whole structural and operational peculiarities of an enterprise need to be studied. So, analysis of the results of the financial and economic activities of the organization as well as assessment of the investment potential of the organization needs to be conducted.

CHAPTER 2. EVALUATION OF THE RESULTS OF THE IMPLEMENTATION OF THE INVESTMENT PROGRAM OF PJSC "PhosAgro"

2.1 Analysis of the results of the financial and economic activities of the organization on the basis of coefficient analysis

PJSC "PhosAgro" produces phosphate-based fertilizers. There are more than 50 items among the products they produce.

PhosAgro Group includes Apatit in Cherepovets (Vologda Region), its branches in Kirovsk (Murmansk Region), Balakovo (Saratov Region) and Volkhov (Leningrad Region), PhosAgro-Region and the Samoilov Research Institute for Fertilizers and Insect fungicides.[14]

The company is the largest manufacturer of these products in Europe. The products are supplied to more than 100 countries around the world on all inhabited continents, but the key market is Russia, where the company supplies more fertilizers than to any other country in the world.

Current investment program of PJSC "PhosAgro" is aimed at the development of efficient, flexible and high-tech facilities using BAT, including advanced developments of one of the world's leading specialized research institutes.

Coefficient analysis is aimed to check whether the company is able to obtain its strategic goals as well as adopt proper for this aim investment program by assessing its liquidity, financial stability, profitability and business activity.

The results of analysis that can be found in appendix, table 2.1 and table 2.2 led to the following conclusions :

1. In 2023 profitability and business activity ratios have become better compared to 2022.
2. Liquidity and financial stability ratios have remained on the same level in 2023 and 2022.

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1. [14] PhosAgro website URL:https://www.phosagro.ru/press/company/fosagro-provedet-konvertatsiyu-privilegirovannykh-aktsiy/(accessed: 05.05.2024).

3. The company rating in 2023 (2,995) is higher than in 2022 (2,645), so the company's condition is considered good, there is no interclass transition.

Stated above conclusions prove that the results of the financial and economic activities of the organization are successful as well as its current investment program.

2.2 Assessment of the investment potential of the organization

The WACC value shows the lower limit of the required profitability of the project. Managers, by raising capital from various sources, optimize the company's capital structure.

The WACC indicator in investment analysis is used for:

1) calculation of such dynamic performance indicators as a discount rate as: net present value, profitability index and discounted payback period. In practice, when calculating this indicator, an additional risk premium is added to the result obtained;[15]

2) determining the efficiency of comparing the weighted average price of capital with the internal rate of return. [16]

The value of the WACC indicator is influenced by many factors: the company's own activities and the external environment. The weighted average cost of capital is one of the key indicators influencing cost reduction K (capital investment or invested capital).[17]

In this case, WACC will be used to determine whether current investment program of the company is effective.

WACC is estimated on different levels of leverage using the following formula:

[15]Aswath Damodaran website Damodaran Online [Electronic resource]. Mode of access: http://people.stern.nyu.edu/adamodar/ (accessed: 13.05.2024)
[16] Shou, Tianle. (2022). A Literature Review on the Net Present Value (NPV) Valuation Method. 10.2991/aebmr.k.220603.135.
[17] Shou, Tianle. (2022). A Literature Review on the Net Present Value (NPV) Valuation Method. 10.2991/aebmr.k.220603.135.

$$WACC = l\Big(\big(R_f + spread(default)\big)(1-T) - T\beta\big(R_m - R_f\big)\Big) + R_f + \beta\big(R_m - R_f\big) \qquad 2.1$$

Used exogenous parameters are:

T = 20% - corporate tax rate in the Russian Federation,

E=165 bill. RUB – company equity as of 2023,

R_f = 11.64% - risk-free rate, which is assumed to be equal to government 1Y bonds return,

Spread(default) was estimated for different levels of leverage using accordance of different leverage intervals to different credit scores, and of credit scores to spread. Correspondence tables from A. Damodaran were used.

R_m=18.40% - market return, Moscow exchange MOEX index (IMOEX) year return,

$\beta_{\text{unleveraged}} = 0.249 \pm 0.026$ was calculated from OLS regression of daily PHOR returns against daily MOEX index returns using historical data of approximately 3 years

Table 2.3 – WACC calculation results

$\frac{D}{D+E}$	D	Credit score	$\beta_{levered}$	spread default	$\boldsymbol{R_e}$	R_d	WACC
0%	0	AAA	0,249	0,69%	13,33%	12,33%	13,33%
10%	18	AA	0,272	0,85%	13,48%	12,49%	13,13%
20%	41	A	0,299	1,42%	13,66%	13,06%	13,02%
22%	47	A	0,306	1,42%	13,71%	13,06%	12,99%
24%	52	A	0,312	1,42%	13,75%	13,06%	12,96%
26%	58	A-	0,320	1,62%	13,80%	13,26%	12,97%
28%	64	A-	0,327	1,62%	13,85%	13,26%	12,94%
29%	67	A-	0,331	1,62%	13,88%	13,26%	12,93%
30%	71	BBB	0,335	2,00%	13,90%	13,64%	13,01%
34%	85	BB+	0,352	2,42%	14,02%	14,06%	13,08%
40%	110	BB	0,382	3,13%	14,23%	14,77%	13,26%
50%	165	B	0,449	5,26%	14,67%	16,90%	14,10%

Source: compiled by author on the base of PhosAgro.ru

The dynamics of WACC for different levels of leverage can be found in Fig. 2.1.

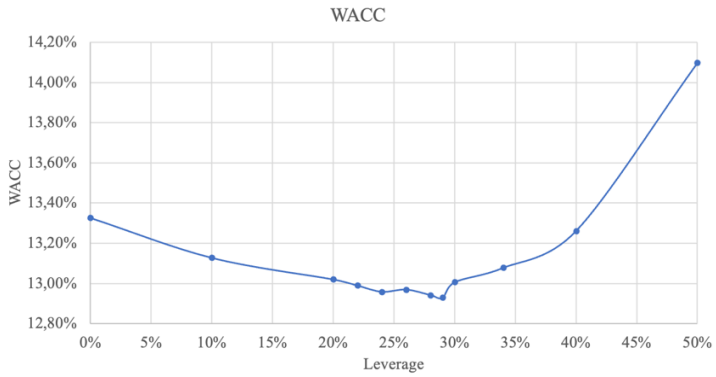

Figure 2.1 — Dynamics of WACC for different levels of financial leverage

Source: compiled by author on the base of PhosAgro.ru

It can be seen from the graph that WACC is minimized by leverage l∈[20%,30%]. Calculation with steps of 1% showed minimum is at 29%. Minimal WACC is equal to 12.93%. WACC at current leverage of 34% is 13.08%, 0.15% higher than the minimum.

The next method to consider is probability of default level.

Financial stability cannot be assured if probability of default is high. A possible way to calculate probability of default is $p_{default} = p(EBIT < D)$

Using historical data, EBIT for current year can be forecasted. Historical data from 2011 is available, however from 2011 to 2018 EBIT dynamics were unstable, as it can be seen in Fig. 2.2.

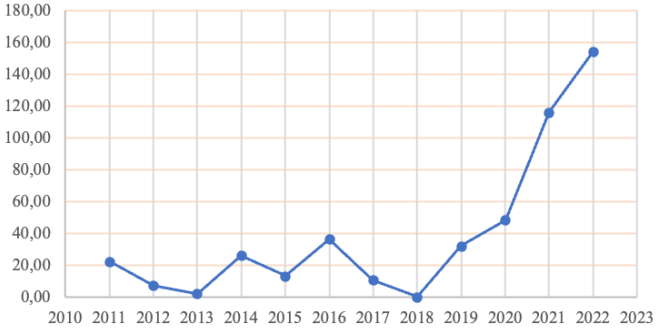

Figure 2.2 Dynamics of EBIT, bill. RUB.

Source: compiled by author on the base of PhosAgro.ru

From year 2019 until 2022 trend has changed, and this data can be used for a linear forecasting model, which is shown by Fig. 2.3.

$$\text{EBIT} \sim \text{A} \cdot (\text{YEAR} - 2019) + \text{B}.$$

$$R^2 = 95.4\%$$

$$A = 43 \pm 7; B = 23 \pm 13.$$

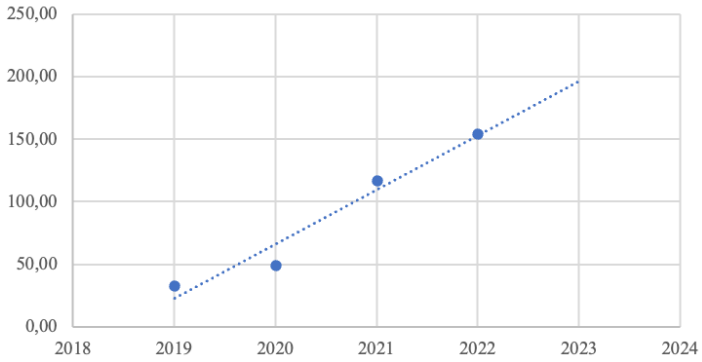

Figure 2.3 Regression results, bill. RUB.

Source: compiled by author on the base of PhosAgro.ru

Overall, the forecast for 2023 EBIT:

$$\widehat{EBIT}(2023) = 196$$

$$\sigma_{EBIT(2023)} = \sqrt{(\sigma_A \cdot 4)^2 + (\sigma_B)^2} = 30$$

So, as it can be seen from Fig. 2.4, $\widehat{EBIT}(2023) \sim \mathcal{N}(196, 30)$.

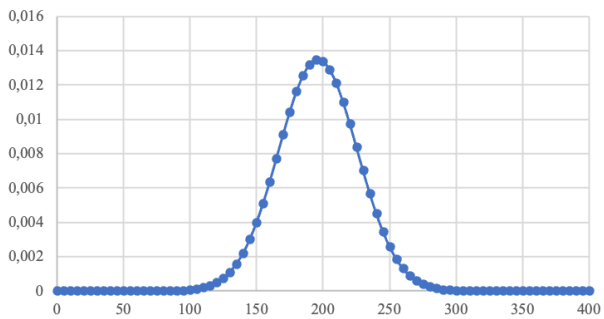

Figure 2.4 EBITDA(2023) probability density function

Source: compiled by author on the base of PhosAgro.ru

Therefore, $p_{default}(D) = p(EBIT < D) = \int_{-\infty}^{D} \frac{1}{\sqrt{2\pi}\,30} e^{-\frac{1}{2}\left(\frac{x-196}{30}\right)^2} dx.$

$D = \frac{E}{\frac{1}{l}-1} \cdot R_D(l), so\ p_{default}$ can be seen as a function of leverage l.

Calculation shows (Fig. 2.5), $p_{default}$<1% for l<74%, and at $l_{critical} \approx 74\%$ $p_{default}$ starts to rapidly increase. Both current leverage of 34% and leverage of 29% which minimizes WACC are far less than $l_{critical}$ so the range of realistic leverage values has a low default probability.

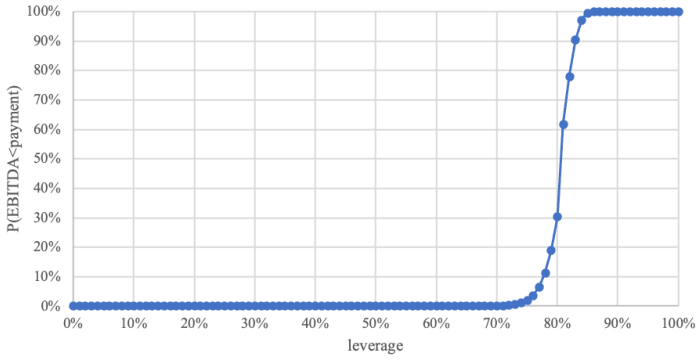

Figure 2.5 P(EBITDA<payment)

Source: compiled by author on the base of PhosAgro.ru

The last method to apply is EBIT-EPS. First of all, it is needed to calculate the critical point for fixed amount of capital. The critical point itself, as the EBIT value, corresponds to the equal net profit per share for all options of the company's capital structure[18]:

$$EPS_1 = EPS_2 = \frac{(EBIT^* - I_1)(1-t) - D_{priv}}{N_1} = \frac{(EBIT^* - I_2)(1-t) - D_{priv}}{N_2}, \qquad (2.2)$$

where:

t – the income tax rate;

D_{priv} – dividends on preferred shares;

$I_{1,2}$ – the total annual value of interest payments by capital structure options (in monetary terms)

[18] Anitha A. "A Theoretical Framework on EBIT-EPS Analysis", Research Gate. 24. 2020, pp. 15557

$N_{1,2}$– number of outstanding shares by capital structure options.

Let's assume the company needs to raise a fixed amount of capital – 10 billion RUB, for example.

Let index 1 describe the case of raising capital by gaining more debt, and index 2 – by issuing more shares.

Current number of shares is 129.5 million, each share trades for 6777 RUB. This means to raise additional 10 bill. RUB it is required to issue $\frac{10\text{ billion}}{6777} \approx 14.8\ mill.shares$. There are no preferred shares.

Therefore, parameters for EPS calculation are:

$$D_{priv} = 0$$

$$N_1 = 129.5\ million$$

$$N_2 = N_1 + 14.8\ million = 144.3\ million$$

$$t = 20\%$$

$$I_1 = (86 + 10) bill.RUB \cdot R_{d_1} = 13.5\ bill\ RUB$$

$I_2 = 86\ bill.RUB \cdot R_{d_2} = 12.1$ bill. RUB

$R_{d_1} = R_{d_2} = R_d = 14.06\%\ (corresponding\ to\ BB + credit\ score)$

EBIT is a varying parameter.

Calculation shows critical point is $EBIT^* \approx 136\ bill\ RUB$.

For $EBIT < EBIT^*$, preferable method of financing 10 bill RUB is by issuing more shares.

For $EBIT > EBIT^*$, preferable method of financing 10 bill RUB is by debt.

Forecasted EBIT of 2023 is $196\ bill\ RUB > EBIT^*$, meaning preferable method of financing 10 bill RUB is currently by debt.

On the Fig. 2.6 the dependence of EPS from EBIT is depicted for two different ways of financing. It can be seen that for debt and for shares emission it is almost

the same, so it is needed to construct Fig 2.7 that shows the difference of EPS for both ways.

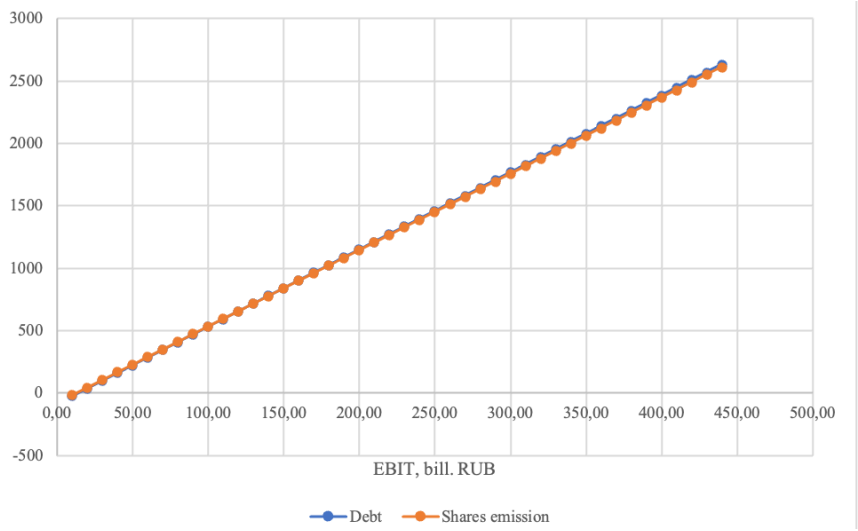

Figure 2.6 Dependence of EPS from EBIT

Source: compiled by author on the base of PhosAgro.ru

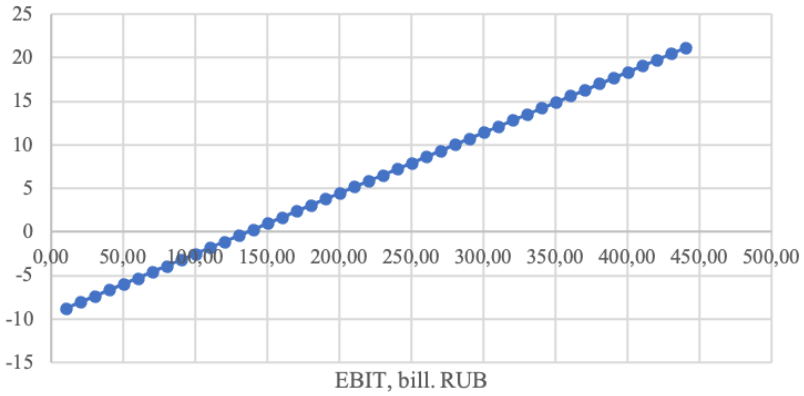

Figure 2.7 EPS(debt)-EPS(shares), bill. RUB.

Source: compiled by author on the base of PhosAgro.ru

The next step is to research fixed EBIT.

Required capital of 10 bill. RUB was chosen arbitrarily and can vary in reality. So, another way of analysis is fixing the parameter of EBIT to our forecast of 196 $bill\ RUB$ and varying amount of required capital while simultaneously calculating corresponding number of shares to be issued, leverage and corresponding R_d.

Fig 2.8 depicts the EPS for two ways of financing depending on the amount of capital, while Fig. 2.9, again, the difference of EPS for both ways of financing.

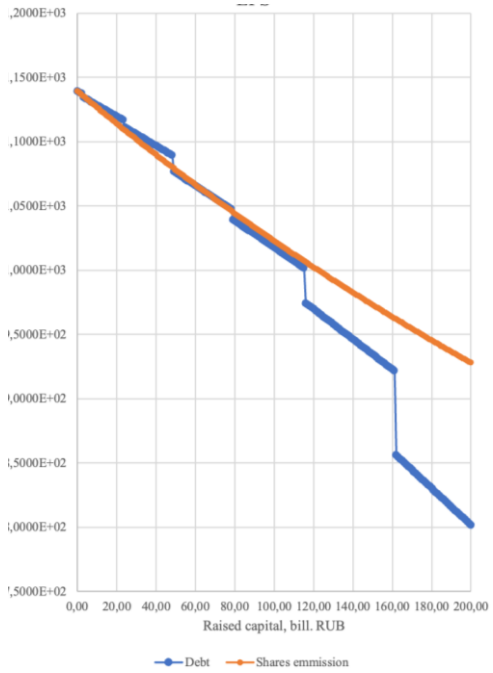

Figure 2.8 Dependence of EPS from EBIT

Source: compiled by author on the base of PhosAgro.ru

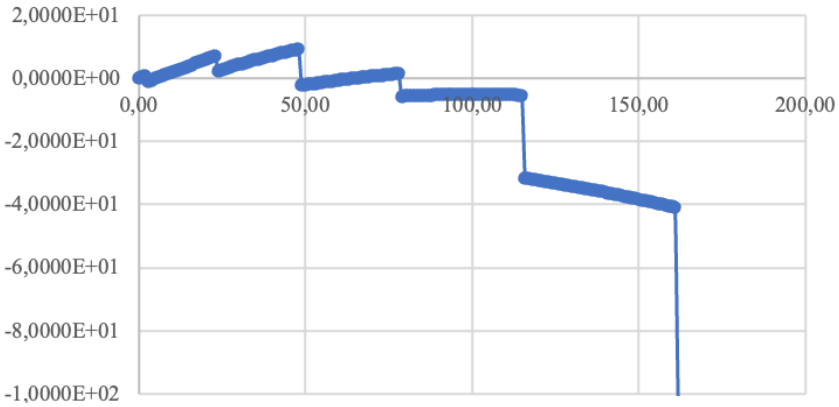

Fig. 2.9 EPS(debt)-EPS(shares), bill. RUB.

Source: compiled by author on the base of PhosAgro.ru

For raised capital $\in (0,3) \cup (6,49) \cup (64,79)$ bill. RUB EPS from financing by debt is higher.

For raised capital $\in (3,6) \cup (49,64) \cup (79,+\infty)$ bill. RUB EPS from financing by shares emission is higher.

Neglecting the differences of order of 1 RUB, or approximately 0.1% of EPS, there is one critical point at $EBIT^* \approx 79$ bill RUB. For $EBIT < EBIT^*$ $EPS_{emission}(EBIT) \lessapprox EPS_{debt}(EBIT)$. For $EBIT > EBIT^*$ $EPS_{debt}(EBIT) \lessapprox EPS_{emission}(EBIT)$.

It can therefore be concluded that at the current level of EBIT smaller investments should be financed by debt, and large ones – by emission.

The general conclusion is that the investment program of the PJSC "PhosAgro" is effective, but there are certainly the areas to improve.

CHAPTER 3. DEVELOPMENT OF RECOMMENDATIONS FOR THE FORMATION OF THE INVESTMENT PROGRAM OF PJSC “PhosAgro”

3.1 Justification of the strategic directions of development of PJSC “PhosAgro”

It was already mentioned that the investment program of PJSC “PhosAgro” suits current strategic goals of an enterprise, however, the program can be further adjusted. In their strategic report, company describes various investment projects that are likely to be implemented in 2023, so it is needed to construct optimal investment portfolio for future years.

The first group of investment projects are production projects. Project 1 includes launch of NPK(S) production, Project 2 consists of expansion of ammonia production, Projects 3 includes in-house production of potassium and sodium salts, including own raw material — nepheline concentrate. First two projects are of rather large scale so according to the previous analysis they are needed to be financed mainly by equity, while third can be financed by debt.

The second group consists of sales projects. Project 1 leads to entering the segment of sales of related products (plant protection products, seeds, feed additives)., Project 2 includes development of a service model and distribution of agricultural machinery Those are medium and small-scale projects, so it is preferable to finance them by debt.

The third group consists of one recycling investment project, which is also small-scale, and consists of increase in the share of waste of I-IV hazard classes for disposal and neutralization to 40%.

To achieve optimal investment program, it is needed to construct an investment portfolio based on G. Albach’s model as it takes into account the synchronic aspect of creating both financial and investment programs including costs of different ways of financing.

It is first needed to calculate the net present value, internal rate of return, payback period for each project submitted, the results can be found

in table 3.1.

Table 3.1 – Calculation of NPV, IRR

Type of activity	Project	Total capital investment for the project, bln. rub.	Capital investment in 2023, bln. rub.	NPV, bln. rub.	IRR, %	Payback period, years
Production	1	38,76	25,00	116,57	44%	3
	2	14,06	10,00	23,04	50%	3
	3	5,34	5,00	3,48	39%	3
Sales	1	11,53	9,50	20,07	48%	3
	2	4,41	3,55	1,63	31%	3
Recycling	1	4,48	2,86	5,88	77%	2
Total		78,58	55,91	170,66		

Source: compiled by author on the base of PhosAgro.ru

It can be seen from the given above table that projects can be ranged based on their investment attractiveness, taking into account sources of financing as well as WACC. Projects are considered more preferable if the values of NPV and IRR are higher. The results of ranging can be found in table 3.2.

Table 3.2 – Ranging of investment projects

Project	Total capital investment for the project, bln. rub.	Capital investment in 2023, bln. rub.	NPV, bln. rub.	IRR, %	Equity	Debt	WACC, %
1.1	38,76	25,00	116,57	44%	0,44	0,56	15,65%
1.2	14,06	10,00	23,04	50%	0,46	0,54	14,67%
2.1	11,53	9,50	20,07	48%	0,46	0,54	14,64%
1.3	5,34	5,00	3,48	39%	0,47	0,53	14,46%
2.2	4,41	3,55	1,63	31%	0,47	0,53	14,44%
3.1	4,48	2,86	5,88	77%	0,47	0,53	14,48%
Total	78,58	55,91	170,66				

Source: compiled by author on the base of PhosAgro.ru

It can be said that the most preferable projects are of production group, which correlates with strategic aims of the company, the least preferable project is recycling project, which is not surprising as it of social sphere. It is needed to continue the analysis to construct optimal investment program.

3.2 Selecting the form of financial support and determining the investment program of PJSC "PhosAgro"

To determine the investment program of PJSC "PhosAgro" it is needed to calculate the objective function (1.1) according to G. Albach model it is necessary to calculate the amount of costs for the implementation of each project. The results of calculation can be found in table 3.3.

Project	Total capital investment for the project, bln. rub.	Capital investment in 2023, bln. rub.	NPV, bln. rub.	IRR, %	Equity	Debt	Equity CapEx, bln. rub.	Debt CapEx, bln. rub.	Costs of raising capital, bln. rub.
1.1	38,76	25,00	116,57	44%	0,44	0,56	38,76	0	3,9
1.2	14,06	10,00	23,04	50%	0,46	0,54	14,06	0	1,5
2.1	11,53	9,50	20,07	48%	0,46	0,54	0	9,50	1,4
1.3	5,34	5,00	3,48	39%	0,47	0,53	5,34	0,00	0,7
2.2	4,41	3,55	1,63	31%	0,47	0,53	0	4,41	0,5
3.1	4,48	2,86	5,88	77%	0,47	0,53	0	4,48	0,4
Total	78,58	55,91	170,66				58,16	18,39	8,42

Table 3.3 – Costs calculation

Source: compiled by author on the base of PhosAgro.ru

PJSC "PhosAgro" does not nave enough funds, so it is needed to form a sufficient set of projects in terms of budget restrictions.

Calculation of the objective function according to the Albach model has shown that max C for all investment projects equals to 87 bill. rub. with the necessary budget for 2023 of 54 bill. rub. For optimal investment portfolio max C equals to 80 bill. rub. with the necessary budget for 2023 of 50 bill. rub.

It can be assumed that projects 2.2 and 3.1 need to be excluded from the investment portfolio due to the fact that as a result of ranging they are not preferable.

It is needed to calculate the objective function for an investment portfolio without taking into account investments in projects 2.2. and 3.1. As a result, the optimal investment portfolio is achieved. The results can be found in table 3.4.

Table 3.4– Investment portfolio

Project	Total capital investment for the project, bln. rub.	Capital investment in 2023, bln. rub.	NPV, bln. rub.	IRR, %	Equity	Debt	Equity CapEx, bln. rub.	Debt CapEx, bln. rub.	Costs of raising capital, bln. rub.
1.1	38,76	25,00	116,57	44%	0,44	0,56	38,76	0	3,9
1.2	14,06	10,00	23,04	50%	0,46	0,54	14,06	0	1,5
2.1	11,53	9,50	20,07	48%	0,46	0,54	0	9,50	1,4
1.3	5,34	5,00	3,48	39%	0,47	0,53	5,34	0,00	0,7
Total	69,69	49,50	163,15				58,16	9,50	7,49

Source: compiled by author on the base of PhosAgro.ru

It can be concluded that project 2.2 , that includes development of a service model and distribution of agricultural machinery and project 3.1 that consists of increase in the share of waste of I-IV hazard classes for disposal and neutralization are not suitable for PJSC “PhosAgro” in situation of budgetary restrictions. The future investment program needs to be formed in absence of those projects.

CONCLUSION

The purpose of this course project was to form an investment portfolio of a company and analyze the effectiveness of its implementation.

As it was stated above, the tasks of this course work were:

1. To define the essence of investment in the economic activity of the company.
2. Study methodological approaches to the development of an investment program.
3. Give general conclusions of the economic state of the company and its investment management in terms of its optimization.
4. Give and test the recommendations on improving the efficiency of an investment program of a company.

The tasks were completed, the purpose was achieved and the following results were obtained:

1. In 2023 profitability and business activity ratios have become better compared to 2022.
2. Liquidity and financial stability ratios have remained on the same level in 2023 and 2022.
3. The company rating in 2023 (2,995) is higher than in 2022 (2,645), so the company's condition is considered good.
4. At the current level of EBIT smaller investments should be financed by debt, and large ones – by emission.
5. Current investment program of the PJSC "PhosAgro" is effective
6. New investment program needs to be formed by creating an investment portfolio out of the following projects:

1) launch of NPK(S) production;
2) expansion of ammonia production;
3) in-house production of potassium and sodium salts;
4) entering the segment of sales of related products.

The general conclusion is that the problem of optimizing the project set for the investment program a company will be to ensure the optimal combination of projects within the approved budget in a given time interval.

The selection of each project met the following requirements:

1. The project meets the strategic goals of the company and does not stretch the terms of their development.

2. The implementation of the selected projects makes it possible to increase the commercial efficiency of the entire project portfolio and the amount of borrowed funds in the project complex is small, taking into account the current cost of borrowed funds.

Such requirements will allow the cash flows of initial projects to be formed in such a way as to finance subsequent investments. In the analyzed above case it was possible to meet all the requirements and form an optimal investment program.

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APPENDIX

Table 2.1– Coefficient analysis 2023

2023				
Coefficient	Normative interval			
	Importance of the group in the overall rating assessment	Actual coefficient value	Coefficient assessment, points	Assessment of a group of indicators taking into account the significance of the group, points
Liquidity				
Current liquidity ratio	0,1	1,01	2	0,2
Quick liquidity ratio	0,1	0,71	3	0,3
Absolute liquidity ratio	0,1	0,28	3	0,3
Group average	**0,3**			
Financial stability ratios				
Debt/Equity	0,1	0,62	4	0,4
NWC/Equity	0,025	0,36	3	0,075

Equity/Assets	0,025	0,67	3	0,075
Group average	**0,15**			
Profitability				
Profitability of assets based on EAT	0,1	0,29	4	0,4
Profitability of equity based on EAT	0,1	0,31	4	0,4
Profitability of sales	0,2	0,30	4	0,8
Group average	**0,4**			
Business activity ratios				
Turnover of current assets ratio	0,005	5,12	3	0,015
Turnover of equity	0,005	3,20	3	0,015
Return of assets	0,005	5,12	3	0,015
Group average	**0,15**			
Company rating	**1**			2,995

Source: compiled by author on the base of PhosAgro.ru

Table 2.2– Coefficient analysis 2022

2022				
Coefficient	Normative interval			
	Importance of the group in the overall rating assessment	Actual coefficient value	Coefficient assessment, points	Assessment of a group of indicators taking into account the significance of the group, points
Liquidity				
Current liquidity ratio	0,1	1,11	2	0,2
Quick liquidity ratio	0,1	0,88	3	0,3
Absolute liquidity ratio	0,1	0,29	3	0,3
Group average	**0,3**			
Financial stability ratios				
Debt/Equity	0,1	0,87	3	0,3
NWC/Equity	0,025	0,23	2	0,05
Equity/Assets	0,025	0,54	2	0,05

Group average	**0,15**			
Profitability				
Profitability of assets based on EAT	0,1	0,26	4	0,4
Profitability of equity based on EAT	0,1	0,28	4	0,4
Profitability of sales	0,2	0,27	3	0,6
Group average	**0,4**			
Business activity ratios				
Turnover of current assets ratio	0,005	4,27	2	0,01
Turnover of equity	0,005	4,27	4	0,02
Return of assets	0,005	4,27	3	0,015
Group average	**0,15**			
Company rating	**1**			2,645

Source: compiled by author on the base of PhosAgro.ru