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# Forecasting investment processes in airlines

***Abstract***

*Object:* The object of the article is to study the modeling of investment processes on the example of airlines.

*Methods:* Systematic approach, the methods of scientific knowledge, induction, deduction, comparison, statistics, comparability, financial analysis, mathematical modeling, analysis and forecasting.

*Results*: The financial risk of the considered airline project is mainly related to the prices for aircraft maintenance services, which are at low limits. The severity of the consequences of this risk is critical and there is a high probability of these events. From the risk analysis, it can be concluded that the most likely financial risk is the one that can suffer the most damage. Air Astana JSC needs to use the proposed risk analysis to form a judgment about the possible consequences and probabilities of investment project risks. Based on the research of investment processes in airlines, recommendations were formulated in the field of investment project evaluation.

*Conclusions*: Based on the analysis of the investment activity of the Kazakh company, it was revealed that outdated methods of evaluating the effectiveness of investment projects are used and it was proposed to use quantitative risk analysis and break-even assessment of the airline's investment projects for this purpose. Despite the difficulties, aviation financing is an opportunity for new participants to get attractive returns, provided that the asset type and timing are chosen correctly. Based on the calculations, the inefficiency of the investment activity of the proposed Kazakh airline was revealed. The proposed methodology for calculating the break-even boundaries of investment projects will help improve the efficiency of investments.

***Keywords:*** investment, investment project, modeling, performance evaluation, break-even analysis, risk analysis, forecasting investment processes, airline economy.

## *Introduction*

Aviation is one of the fastest-growing sectors in the world, combining technology, innovation, entrepreneurship, economic development, infrastructure support, demographic growth, and contribution to globalization. Progress in this sector is impressive in its speed and diversity in nature. Economic growth and passenger traffic growth are two key indicators of the growth of commercial aviation worldwide. Economic growth in the region has a strong impact on the increase in demand for air transportation. While this is true in aggregate, the extent to which air traffic is growing relative to gross domestic product (GDP) is not consistent globally. As a rule, in developing countries, air traffic is growing at a much higher rate than GDP.

Provisions submitted:

1. Large airlines pay for their planes in about 5–7 years. Smaller airlines may take up to ten years to repay their funding. The lease can last from several years to most of a decade. In this regard, we must find more optimal types of investments.

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2. Restructuring the aircraft fleet is difficult or impossible on the basis of attracting a bank loan due to the lack of sufficient collateral, the short-term nature of the loan and the appearance of other expenses. In the case of financial investments, the aircraft itself is the subject of collateral.

Investment plays the most important role in the formation and development of the economy of Kazakhstan. Financial security of enterprises occurs when the company's own funds and its income are formed on a monetary basis, attracting borrowed sources of financing for economic activities, distributing the income generated by the results of this activity, and using them for the development of a modern company. The term "investment" comes from the Latin word "invest" — to invest (some authors believe that the word "investment" comes from the Latin "invest" — to tax.

Investments began to be understood as a certain set of elements that are represented by monetary funds, target Bank deposits, shares, and other securities, technologies, machines, equipment, licenses, including trademarks, loans, any other property or property rights, intellectual property invested in business objects and other types of activities to generate profit (income) and achieve a favorable social effect (Antipin, 2019).

The company's investment activities are an important integral part of its overall business activities. The importance of investment in the economy of a modern company can not be overestimated (Arkhipov et al., 2016). Modern production is characterized by a constantly growing capital intensity and an increasing role of long-term factors. In order for a manufacturing company to function successfully, improve product quality, reduce costs, expand production capacity, increase the competitiveness of its products and strengthen its position in the market, it must invest capital, and do it profitably and wisely. Therefore, there is a need to carefully develop an investment strategy and constantly improve it to achieve the above-mentioned goals.

***Methods***

The information base is represented by official data of statistical reporting of Air Astana JSC, industry scientific and technical literature, materials of industry and territorial conferences, results of the author's developments.

During the research, methods of statistical and investment analysis and methods of comparison, systematization were used.

***Literature Review***

Investments are the use of financial resources in the form of short-term or long-term investments. Investments are made by legal entities or individuals. As noted by I.V. Afonin, "types of investments are divided into risk (venture), direct, portfolio and annuities" (Afonin, 2018).

Venture capital is an investment in the form of issuing new shares that are produced in new areas of activity and are associated with a high level of risk. Venture capital is invested in projects that are not interconnected with each other in the expectation of a quick payback period for the invested funds. Venture capital is represented by a combination of various forms of capital: loan, equity, and entrepreneurial.

An investment project is a distribution of resources with the expectation of a profitable return on distribution in the future (Baronin et al., 2016). A return is usually expected a year in the future. One of the main elements of an investment project is the fact that investments are linked not for the short term, but for the long term. Investors do not necessarily have to choose to use excess resources that generate maximum returns. Some investors have different priorities and may need their excess resources to be immediately available, for example, instead of generating the largest amount of money. An investment project, however, as J.-P. Tan points out, is an option for allocating excess resources for the long term, with the expectation that the investment will remain in the project until it reaches a stable income-generating stage and can pay back investors (Tan et al., 2018).

These types of projects are evaluated based on viability. A realistic investment project will offer an attractive interest rate. The suitability of a project often depends on its ability to consistently generate positive cash flows to meet these obligations (Bent, 2019).

In some cases, as S.L. Blau points out, "the return on allocating resources to an investment project is not in money, but in profit" (Blau, 2016). For example, a typical investment project is a real estate investment. Real estate is priced based on the rent it can generate, and the return on investment is expected in the form of money. Investing in a person's education or training, on the contrary, provides a benefit, rather than a direct return on cash. This type of human resources investment project is designed to have different types of returns that relate to the non-monetary goals and objectives of the investor.

The investment policy of a modern airline is a complex, interrelated, and interdependent set of activities aimed at its own further development, generating income, and other favorable effects as a result of investment (Bogatynia et al., 2017).

The development of the investment policy of the airline involves specific actions that are presented: the definition of the long-term goals of the company, the selection of the most promising and profitable investment, development priorities in the development of the company, the evaluation of alternative investment projects, development of technological, marketing, financial projections, assessing consequences of implementation of investment projects (Borisova et al., 2016).

There are certain principles of investment policymaking:

1) legal principle (legal protection of investments);

2) the principle of independence and independence (characterized by freedom of choice of the investment project, its development and implementation);

3) the principle of a systematic approach;

4) the principle of efficiency (represented by the choice of such an investment project that provides the greatest effectiveness) (Damodaran, 2017).

The formation of an airline's investment strategy also depends on the company's marketing policy:

- cost leadership;
- differentiation strategy;
- concentration on the segment (Ryan et al., 2019).

The initial point of justification of the company's investment strategy is represented by an analysis of the market for products already produced by the production company or planned for release (Thomas, 2017).

When choosing a company's investment strategy, it is necessary to determine the total amount of its investments, including possible combinations of various sources of financing and borrowing.

***Results***

Air Astana, a group of airlines based in Almaty, was chosen as the object of the study. It is the largest airline in Kazakhstan, operating domestic and international scheduled flights on 64 routes from Almaty International Airport and Nursultan Nazarbayev International Airport (Semak et al., 2017).

In this section, we will review the assessment of investment activities and investment projects of the company Air Astana JSC. In the financial and economic analysis of investment projects and their risk assessment, the company analyzes financial opportunities. These opportunities are represented by needs and existing debt.

It also analyzes the sources and means of financing the project. Air Astana JSC calculates the recovery period for updated investments, which means the payback period for the project. The specialists of Air Astana JSC also calculate the internal interest rate. This is in particular the discount rate at which the net present value of the project is zero.

The company's specialists form multi-factor financial and economic assessments of investment projects, which is a combination of the methods of risk assessment.

Risk assessment depends on what conditions are present during the implementation of the investment project. Much attention is paid to market demand. The company's specialists also use multi-criteria qualitative assessments of investment projects and take into account uncertainty and risk.

These methods of evaluating investment projects involve determining the effectiveness of different options for combining funds required for the implementation of an investment project and considering scenarios for reducing or increasing risk. Such calculations are the basis for developing decisions on an investment event.

The periods in which the investment project will be implemented are also considered. Since different periods and seasonality of sales can affect the future demand from the investment project. In addition, the crisis phenomena in the economy are taken into account.

Here it is worth noting the risk assessment on the example of a specific project for the overhaul of the company's aircraft, the Boeing 757-200 model. The following is a sensitivity analysis of the project (Table 1).

Table 1. The sensitivity analysis in the repair of Boeing 757-200

| Indicators | Indicators | | |
|---|---|---|---|
| | Max. | Base | Min. |
| 1. Sensitivity level, % | 125 | 100 | 75 |
| 2. Production volume, million tenge | 138.4 | 138,4 | 138,4 |
| 3. Capital investment, million tenge | 1219.2 | 975.4 | 731.574 |
| 4. Cost of electricity, tenge/kWh | 0.9 | 0.7 | 0.6 |
| 5. Net profit, million tenge | 355.126 | 342.968 | 330.812 |
| 6. Net discounted income NPV, million tenge | 313.522 | 362.992 | 412.462 |
| 7. Internal rate of return, % | 14.34 | 15.30 | 16.51 |
| 8. Discount PV, % | 11.00 | 11.00 | 11.00 |
| 9. Discounted payback period, years | 7.00 | 7.00 | 7.00 |
| 10 The expert's assessment, average score | 2.9 | 2.1 | 0.9 |
| *Note – Compiled by the authors based on (Damodaran, 2017).* | | | |

Next, the percentage change in net present value is determined in the event of changes in the economic environment:

– an increase in interest on the loan by 4%. As a result, the net present value will be:

$\%NPV_1=\frac{412.462-362.992}{313.992}=13.6\%$

– fixed costs increased by 10%:

$\%\ NPV_2=\frac{412.462-313.522}{313.522}=31.6\%$

Next, determine the elasticity of changes in the net present value for changes in each factor:

– an increase in interest on the loan by 4%;

$R_1=\frac{13.6}{4}=3.4\%$

– an increase in fixed costs by 11%;

$R_2=\frac{31.6}{11}=2.9\%.$

We present calculations for clarity in Table 2 and determining the rating of the project's sensitivity to changes in the economic environment. This rating is also called the hazard rating of risk factors.

Table 2. The rating of the project sensitivity to changes in the economic environment

| Factors | Changing the factor | Percentage of change NPV | Elasticity coefficient | Rating |
|---|---|---|---|---|
| 1. Interest on credit | +4 % | 13.6% | 3.4 | 1 |
| 2. Fixed costs | +11 % | 31.6 % | 2.9 | 2 |
| *Note – Compiled by the authors based on (Damodaran, 2017).* | | | | |

Thus, the impact of an increase in fixed costs is more significant than the impact of an increase in interest on the loan (Abenova et al., 2019). Calculate the economic efficiency of the project:

$$E=\frac{Productionresults}{Projectimplementationcosts}=\frac{342.96}{975.4}=0.3505\text{or }35.1\%$$

Sensitivity analysis has shown that to ensure positive values that meet the project goals, it is necessary that the level of capital investment increases by no more than 25%, since the internal rate of return decreases with an increase in capital investment. Calculate the project revenue (Table 3).

Table 3. Data on investments and revenues of the Boeing 757-200 aircraft overhaul project for 2019-2026, thousands of tenge

| Investment in the project | Sum |
|---|---|
| 1 | 2 |
| $0^{th}$ month | 171 |
| $1^{th}$ month | 170 |
| $2^{th}$ month | 171 |
| $3^{th}$ month | 181 |
| $4^{th}$ month | 172 |
| $5^{th}$ month | 176 |
| $6^{th}$ month | 177 |
| The income from the project | |

| 1 | 2 |
|---|---|
| 1th month | 313 |
| 2th month | 323 |
| 3th month | 341 |
| 4th month | 347 |
| 5th month | 352 |
| 6th month | 366 |
| 7th month | 377 |
| *Note – Compiled by the authors based on (Borisova et al., 2016).* | |

Table 4 below provides data on discounted expenditures in monetary terms, broken down by month, based on the amount of investment, the duration of the project and the discount rate.

Table 4. Discounted cash flows for the Boeing 757-200 aircraft Overhaul project

| Period (month) | Discount factor | Cash flow, thousands of tenge |
|---|---|---|
| 0 | 1 | 171 |
| 1 | 0.9091 | 154.545 |
| 2 | 0.8264 | 141.322 |
| 3 | 0.7513 | 135.988 |
| 4 | 0.683 | 117.478 |
| 5 | 0.6209 | 109.282 |
| 6 | 0.5645 | 99.912 |
| CFP | | 929.528 |
| *Note – Compiled by the authors based on (Borisova et al., 2016).* | | |

Discounted cash flows by month are calculated using the discount factor. The final discounted cash flows are presented in Table 5.

Table 5. Discounted cash flows for the Boeing 757-200 aircraft Overhaul project

| Period (month) | Discount factor | Cash flow, thousands of tenge |
|---|---|---|
| 1 | 0.9028 | 282.567 |
| 2 | 0.815 | 263.244 |
| 3 | 0.7358 | 250.893 |
| 4 | 0.6642 | 230.484 |
| 5 | 0.5996 | 211.073 |
| 6 | 0.5413 | 198.129 |
| 7 | 0.4887 | 184.241 |
| CF | | 1620.63 |
| *Note – Compiled by the authors based on (Borisova et al., 2016).* | | |

Table 5 shows that cash flows are distributed unevenly and the largest cash flow will be 282.567 thousands tenge in the first MEC of the investment project for the overhaul of the aircraft. The lowest cash flow will be in the 7th month of the investment project implementation and will amount to 184.241 thousands tenge. Table 6 designates the main indicators of the company's investment activity.

Table 6. Indicators of investment activity in Air Astana JSC 2017–2020,%

| Indicators | Value | | | | Changes, +/- | | Regulatory restriction |
|---|---|---|---|---|---|---|---|
| | 31.12.2017 | 31.12.2018 | 31.12.2019 | 31.12.2020 | 2018-2017 | 2019-2018 | |
| Return on net capital | 98.85 | 123.16 | 62.34 | 75.97 | 24.31 | -60.82 | |
| The ratio of investment | 0.4729 | 0.3855 | 0.5315 | 0.4953 | -0.0874 | 0.146 | 0,75 и более |
| Return on fixed assets | 3826.31 | 4988.2 | 4320.32 | 4462.92 | 1161.89 | -667.88 | - |
| Return on Capital Employed (ROCE) | 2025.59 | 2424.04 | 2156.82 | 2174.76 | 398.45 | -267.22 | - |
| *Note – Compiled by the authors based on the source of annual reports of Air Astana JSC for 2017–2020* | | | | | | | |

The company's return on net capital in 2018 increased by 24.31, while in 2019 it decreased by 60.92. The company's investment coverage ratio decreased by 0.0874 in 2018, and increased by 0.146 in 2019, while this ratio is below the norm, which negatively characterizes the investment activity of the company

under study. The return on fixed assets in 2018 increased by 1161.89, and in 2019 it decreased by 667.88. The company's return on invested capital increased by 398.45 in 2018 and decreased by 267.22 in 2019. The return on the use of invested capital was 1735.07%.

It can be concluded that the investment activity of Air Astana JSC is inefficient since, with an increase in revenue of 104.33%, the growth of non-current assets was 198.06%, which allows us to conclude that the assets used are less efficient. The purchasing and production activity of the organization is notable for the fact that at the rate of revenue growth (104.33%), inventory increased to a lesser extent (85.27%), which indicates a more efficient use of related assets.

***Discussions***

To increase the efficiency of investment activities, it is necessary to use modern methods of evaluating investment projects, in particular, calculating the break-even boundaries of investment projects (Gu et al., 2021).

The degree of project sustainability in comparison with possible changes in implementation conditions can be described by indicators of break-even limits or limits for project parameters, such as production, product prices, etc. These indicators are used only to assess the impact of possible changes in project parameters on its financial feasibility and efficiency, but they are not themselves related to project performance indicators, and their calculation does not replace calculations of complex performance indicators.

When using this method, one must perform calculations based on these formulas. Structure of the formula for finding the break-even point for revenue (BEPR):

$$\text{BEPR} = \frac{\left(SP - \frac{DE}{PSV}\right)}{SP}, where DE = PSV \times CP \quad (1)$$

Structure of the formula for finding the break-even point by volume (BEPV):

$$BEPV = FE \frac{SP}{DE/PSV}, where DE = PSV \times CP \quad (2)$$

On the example of the investment project of Air Astana JSC called "construction of an aviation technical center", we use the method of calculating the break-even boundaries of the investment project (Table 7).

Table 7. Break-Even calculations for the project "construction of an aviation technical center", million tenge

| № | Indicators | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|
| 1 | Production and sales volume (PSV) | 4696 | 5057 | 5569 | 4478 | 3604 | 4175 |
| 2 | Selling price (SP) | 100 | 100 | 100 | 100 | 100 | 100 |
| 3 | The cost of production (CP) | 30 | 30 | 30 | 30 | 30 | 30 |
| 4 | Fixed expenses(FE) | 2200 | 2200 | 2200 | 2200 | 2200 | 2200 |
| 5 | Dynamic expenses (DE) | 2863 | 2354.545 | 3099.73 | 2308.039 | 1081.20 | 1209.74 |
| 6 | Revenue (R) | 469600 | 505700 | 556900 | 447800 | 360400 | 390500 |
| 7 | Profit | 464537 | 501145.455 | 551600.27 | 443291.961 | 250080 | 320900 |
| 8 | Reaching the break-even point | EXIST | EXIST | EXIST | EXIST | EXIST | EXIST |
| 9 | Break-even point for revenue (BEPR) | | | | | 2213.494 | |
| 10 | Break-even point by production volume (BEPV) | | | | | 22.1349 | |

*Note – Compiled by the authors based on the source of annual reports of Air Astana JSC for 2015–2020*

During the calculation, we used data on project planning. This method uses the structuring of costs for fixed (always equal to 2.200 million tenge) and dynamic (changing every year). According to Table 7, the break-even point will be reached during 2015–2020.

The break-even point for revenue at the current figures of the selling price, fixed and variable expenses will be 2213.494966 million tenge. The break-even point in terms of production and sales at the current figures of the selling price, fixed and variable expenses will be 22.134966 million tenge.

The break-even point on production and sales at the current figures of the selling price, fixed and variable expenses will be 22.134966 million tenge. The break-even point on revenue – 2213.4494966. Break-even limits can also be set for each project participant (the criterion for reaching the limit is zero net profit from

this participant). To do this, one needs to determine how this participant's income and expenses change when the parameter values for which the limit values are set to change.

We believe that the company needs to use a quantitative risk analysis under conditions of uncertainty, which will allow for the consequences of risks and losses that may occur during the project implementation process and after the project is put into production. Table 8 presents the risks of a project.

It is seen that political demographic risks have the lowest level of probability. Damage from the occurrence of risks can occur when there is an industrial risk – man-made accidents, or equipment failure.

Table 8. Risk register of the project "repair of Boeing 757-200", million tenge

| Risk | Characteristics of the severity of consequences | | Frequency of occurrence | |
|---|---|---|---|---|
| | The damage from the event | The severity of the consequences | Number of events | The probability of the risk occurring |
| Political | Notobserved | Minor | 0.003 | Almost impossible |
| Demographic | Notobserved | Minor | 0.002 | Almost impossible |
| Production risk, thousands tenge | 5 000 | Moderate | 0.005 | Probably |
| Natural risk, thousands tenge | 10 000 | Significant | 0.013 | Average probability |
| Environmental risk, thousands tenge | 50 000 | High | 0.033 | Average probability |
| Financial risk, thousands tenge | 60 000 | Critical | 0.143 | High probability |

*Note – Compiled by the authors based on (Ryan et al., 2019).*

The occurrence of such a risk is quite likely, and the damage may amount to 5.000 thousand tenge. In our case, the natural risk can be represented by cosmogenic events (earthquakes, storms, landslides, etc.). The occurrence of this risk has an average probability and high severity of consequences in the amount of 10.000 thousand tenge.

Environmental risk can be represented by changes in the environment, man-made disasters, or environmental protests (Saduov et al., 2019). In this case, the severity of the consequences of the environmental risk is high and is estimated at 50.000 thousand tenge, but the probability of such risks is average.

The financial risk of this project is mainly related to the prices of aircraft maintenance services, which are at low limits. The severity of the consequences of this risk is critical and the damage from them is estimated at 60.000 thousand tenge, and there is a high probability of these events.

From the risk analysis, it can be concluded that the most likely financial risk is the one that can bear the highest damage. Air Astana JSC needs to use this risk analysis to form opinions about the possible consequences and probabilities of the risks of the investment project.

### *Conclusions*

It will be possible to increase the efficiency of investment activities by using new methods for evaluating projects based on the boundaries of break-even and probabilistic uncertainty. These measures will be effective even with adjustments for economic crises related to the coronavirus pandemic.

### *References*

Abenova, M.H., Parmanova, R.S., & Bolshekbayeva, K.O. (2019). Analysis of efficiency of the use of financial resources of the enterprise. *Reports of the national academy of sciences of the Republic of Kazakhstan, 4 (326),* 36–40. https://doi.org/10.32014/2019.2518–1483.112

Antipin, A.I. (2019). Investitsionnyi analiz v stroitelstve: uchebnoe posobie [Investment analysis in construction: tutorial]. Moscow: Akademiia, 108 [in Russian].

Arhipov, I.S., Dmitreiko, N.S., & Matsuk, I.I. (2016). Modelirovanie vozdeistviya riska na effektivnost funktsionirovaniya predpriyatiya [Modeling the impact of risk on the efficiency of the enterprise]. *Ekonomika i menedzhment informatsionnykh tekhnologii – Economics and management of information technologies, 2,* 104–110 [in Russian].

Afonin, I.V. (2018). Upravlenie razvitiem predpriyatiya. Strategicheskii menedzhment, innovatsii, investitsii, tseny: uchebnoe posobie [Managing the development of enterprise. Strategic management, innovation, investment, prices: tutorial]. Moscow: Dashkov i K, 380 [in Russian].

Baronin, S.A., Kazeikin, V.S., & Popova, I.V. (2016). Ipotechno-investitsionnyi analiz: uchebnoe posobie [Mortgage and investment analysis: tutorial]. Moscow: Infra-M, 494 [in Russian].

Bent, F. (2019). *Megaproekty i riski. Anatomiya ambitsii: monografiia [Megaprojects and risks. Anatomy of ambition: monograph].* Moscow: Alpina Publisher [in Russian].

Blau, S.L. (2016). Investitsionnyi analiz: uchebnik dlya bakalavrov [Investment analysis: a textbook for bachelors]. Moscow: Dashkov i K, 256 [in Russian].

Bogatynia, Yu.V., & Shvandar, V.A. (2017). Investitsionnyi analiz: uchebnoe posobie [Investment analysis: tutorial]. Moscow: UNITY-DANA, 287 [in Russian].

Borisova, O.V., Malykh, N.I., & Oveshnikova, L.V. (2016). Investitsii [Investment]. (Vols. 1-2; Vol. 2 Investment analysis: Textbook and workshop). Lyubertsy: Yurait, 218 [in Russian].

Damodaran, A. (2017). *Investment Valuation. Tools and Techniques for Determining the Value of Any Assets*. New York: John Wiley & Sons.

Ryan, P.A., & Ryan, G.P. (2019). Capital budgeting practices of the Fortune 1000: how have things changed? *Journal of Business and Management*, *8(4),* 355–364.

Saduov, A., Mukanov, B., Asanova, M., Rakhimzhanova, R., & Raimbekov, B. (2019). Questions of cluster interaction of tourism development along the silk road. *Journal of Environmental Management and Tourism,, 10(38),* 1235–1241. https://doi.org/10.14505//jemt.v10.6(38).05

Semak, Y.A., Raimbekov, B.Kh., Assanova, M.K., & Kozhabergenova, A.Y. (2017). Development of transport system of the Republic of Kazakhstan. *Bulletin of the Karaganda University. Economy Series, 1(85),* 45–50.

Tan, J.-P., Anderson, J.R., Belli, P., Barnum, H.N., & Dixon, J.A. (2001). *Economic Analysis of Investment Operations*. https://doi.org/10.1596/0–8213–4850–7

Thomas, D.S. (2017). Investment Analysis Methods: A practitioner's guide to understanding the basic principles for investment decisions in manufacturing. *U.S. National Institute of Standards and Technology. NIST Advanced Manufacturing Series 200–5.* https://doi.org/10.6028/NIST.AMS.200–5. https://nvlpubs.nist.gov/nistpubs/ams/NIST.AMS.200–5.pdf



**К.Г. Садвакасова, А.З. Нурмагамбетова, М. Абенова, И. Монева, А.Ж. Жарасбаева**

**Авиакомпанияларда инвестициялық процестерді болжау**

***Аңдатпа***

*Мақсаты*: Мақаланың мақсаты әуе компаниялары мысалында инвестициялық процестерді модельдеуді зерттеу болып табылады.

*Әдістері:* Жүйелі тәсіл авиация нарығын оның құрылымдық құрамдас бөліктерінің бірлігінде қарастыруға мүмкіндік берді. Зерттеу тақырыбына сәйкес ғылыми таным әдістері қолданылды: индукция, дедукция, салыстыру, статистика, салыстырмалылық, қаржылық талдау, математикалық модельдеу, талдау және болжау.

*Қорытынды:* Қаралған авиакомпания жобасының қаржылық тәуекелі негізінен төмен лимиттердегі әуе кемелеріне техникалық қызмет көрсету жөніндегі қызметтердің бағаларымен байланысты. Бұл тәуекелдің салдарының ауырлығы өте маңызды және бұл оқиғалардың ықтималдығы жоғары. Тәуекелдерді талдаудан ең үлкен зиян келтіруі мүмкін қаржылық тәуекел деп қорытынды жасауға болады. «Эйр Астана» АҚ инвестициялық жоба тәуекелдерінің ықтимал салдарлары мен ықтималдығы туралы пайымдау үшін ұсынылған тәуекелдер талдауын пайдалануы қажет. Авиакомпаниялардағы инвестициялық процестерді зерттеу негізінде инвестициялық жобаларды бағалау бойынша ұсыныстар жасалды.

*Тұжырымдама:* Қазақстандық компанияның инвестициялық қызметін талдау негізінде инвестициялық жобалардың тиімділігін бағалаудың ескірген әдістері пайдаланылатыны анықталды және осы мақсат үшін тәуекелдердің сандық талдауын және авиакомпанияның инвестициялық жобаларының шығынсыздығын бағалауды пайдалану ұсынылды. Қиындықтарға қарамастан, авиациялық қаржыландыру жаңадан қатысушылар үшін актив түрі мен уақытын дұрыс таңдаған жағдайда тартымды табыс алу мүмкіндігі болып табылады. Есептеулер негізінде ұсынылып отырған қазақстандық әуе компаниясының инвестициялық қызметінің тиімсіздігі анықталды. Инвестициялық жобалардың залалсыздық шекараларын есептеудің ұсынылып отырған әдістемесі инвестициялардың тиімділігін арттырады.

***Кілт сөздер:*** инвестициялар, инвестициялық жоба, инвестициялық талдау, модельдеу, тиімділікті бағалау, үзіліссіз талдау, тәуекелдерді талдау, инвестициялық үдерістерді болжау, авиакомпания экономикасы.

**К.Г. Садвакасова, А.З. Нурмагамбетова, М. Абенова, И. Монева, А.Ж. Жарасбаева**

**Прогнозирование инвестиционных процессов в авиакомпаниях**

***Аннотация:***

*Цель*: Целью статьи является изучение моделирования инвестиционных процессов на примере авиакомпаний.

*Методы*: Системный подход позволил рассмотреть авиационный рынок в единстве его структурных составляющих. В соответствии с предметом исследования использовались методы научного познания: индукции,

дедукции, сравнения, статистики, сопоставимости, финансового анализа, математического моделирования, анализа и прогнозирования.

*Результаты*: Финансовый риск проекта рассмотренной авиакомпании, в основном, связан с ценами на услуги по техническому обслуживанию воздушных судов, которые находятся на низких лимитах. Тяжесть последствий данного риска является критической, и существует высокая вероятность данных событий. Из анализа рисков можно сделать вывод, что наиболее вероятным финансовым риском является тот, который может понести наибольший ущерб. АО «Эйр Астана» необходимо использовать предложенный анализ рисков для формирования суждения о возможных последствиях и вероятностях рисков инвестиционного проекта. На основе исследования инвестиционных процессов в авиакомпаниях сформулированы рекомендации в области оценки инвестиционных проектов.

*Выводы*: На основе анализа инвестиционной деятельности казахстанской компании выявлено, что используются устаревшие методы оценки эффективности инвестиционных проектов, количественный анализ рисков и оценка безубыточности инвестиций авиакомпании. Несмотря на сложности, авиационное финансирование — это возможность для новых участников получить привлекательную доходность при условии правильного выбора типа актива и сроков. На основании расчетов выявлена неэффективность инвестиционной деятельности предлагаемой казахстанской авиакомпании. Данная методика расчета границ безубыточности инвестиционных проектов позволит повысить эффективность инвестиций.

***Ключевые слова*:** инвестиции, инвестиционный проект, инвестиционный анализ, моделирование, оценка эффективности, анализ безубыточности, анализ рисков, прогнозирование инвестиционных процессов, экономика авиакомпаний.

### *References*

Abenova M.H. Analysis of efficiency of the use of financial resources of the enterprise / M.H. Abenova , R.S. Parmanova , K.O. Bolshekbayeva // Reports of the national academy of sciences of the Republic of Kazakhstan. — 2019. — Vol. 4, No. 326. — P. 36–40.

Gu Z. Investment Analysis of Airline Companies in Pandemic. A Comparative Study of CEA and UAL / Z. Gu, X. Liang, Y. Yu // Advances in Economics, Business and Management Research. Proceedings of the 2021 3rd International Conference on Economic Management and Cultural Industry (ICEMCI 2021) — 2021. — Vol. 203. — P. 1103–1109.

Damodaran A. Investment Valuation. Tools and Techniques for Determining the Value of Any Assets / A. Damodaran. — New York: John Wiley & Sons, 2017. — 560 p.

Ryan P.A. Capital budgeting practices of the Fortune 1000: how have things changed? / P.A. Ryan, G.P. Ryan // Journal of Business and Management. — 2019. — No. 8(4). — P. 355–364.

Saduov A. Questions of cluster interaction of tourism development along the silk road / A. Saduov, B. Mukanov, M. Asanova, R. Rakhimzhanova, B. Raimbekov // Journal of Environmental Management and Tourism. — 2019. — Vol. 10. — Issue 6(38). — P. 1235–1241.

Semak Y.A. Development of transport system of the Republic of Kazakhstan / Y.A. Semak, B.Kh. Raimbekov, M.K. Assanova, A.Y. Kozhabergenova // Bulletin of the Karaganda University. Economy Series. — 2017. — No. 1 (85). — P. 45–50.

Thomas D.S. Investment Analysis Methods: A practitioner’s guide to understanding the basic principles for investment decisions in manufacturing. — U.S. National Institute of Standards and Technology, 2017. — 42 p. https://doi.org/10.6028/NIST.AMS.200–5

Антипин А.И. Инвестиционный анализ в строительстве [Текст]: учеб. пос. / А.И Антипин. — М.: Academia, 2019. — 108 с.

Архипов И.С. Моделирование воздействия риска на эффективность функционирования предприятия / И.С. Архипов, Н.С. Дмитрейко, И.И. Мацюк // Экономика и менеджмент информационных технологий. — 2016. — № 2. — С. 104–110.

Афонин И.В. Управление развитием предприятия. Стратегический менеджмент, инновации, инвестиции, цены [Текст]: учеб. пос. / И.В. Афонин. — М.: Дашков и К, 2018. — 380 с.

Баронин С.А. Ипотечно-инвестиционный анализ [Текст]: учеб. пос. / С.А. Баронин, В.С. Казейкин, И.В. Попова. — М.: Инфра-М, 2016. — 494 с.

Бент Ф. Мегапроекты и риски. Анатомия амбиций [Текст]: моногр. / Ф. Бент. — М.: Альпина Паблишер, 2019. – 500 с.

Блау С.Л. Инвестиционный анализ [Текст]: учеб. для бакалавров / С.Л. Блау. — М.: Дашков и К, 2016. — 256 с.

Богатыня Ю.В. Инвестиционный анализ [Текст]: учеб. пос. / Ю. В. Богатыня, В.А. Швандар. — М.: ЮНИТИ-ДАНА, 2017. — 287 с.

Борисова О.В. Инвестиции: [В -х 2 т.]. — Т.1. Инвестиционный анализ [Текст]: учеб. и практ. / О.В. Борисова, Н.И. Малых, Л.В. Овешникова. — Люберцы: Юрайт, 2016. — 218 с.