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Economic sciences

FACTORS AFFECTING MARKET CAPITALIZATION OF RUSSIAN OIL COMPANIES: AN ECONOMETRIC ANALYSIS

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Abstract

This study investigates the determinants of market capitalization in Russian oil companies, focusing on the roles of financial indicators such as leverage, return on assets (ROA), return on equity (ROE), net assets, and EBITDA. Using a panel data regression model over a 12-year period, we analyze data from 13 major Russian oil companies. The results highlight the positive impact of net assets and EBITDA on market capitalization, while leverage and ROA show weaker relationships with market value. The study also finds significant differences in company performance based on individual effects, with implications for investors and policymakers seeking to enhance the financial stability and attractiveness of the Russian oil sector. This research contributes to understanding the economic factors influencing the oil industry, particularly under conditions of geopolitical tension and market volatility.

Keywords: Market Capitalization, Russian Oil Companies, Econometric Analysis, Leverage, Net Assets, EBITDA, Return on Assets (ROA), Return on Equity (ROE), Panel Data Regression, Financial Indicators, Oil Industry, Russia, Economic Modeling

1. Introduction

Oil production in Russia increased steadily in the 2010s. This was due to the active development of new fields, the implementation of modern production technologies, and high oil prices on global markets. Between 2010 and 2014, the country's oil refining volumes increased. This growth was driven by refinery modernization and increased domestic demand for petroleum products.

In 2013, Russia produced approximately 10.5 million barrels per day. Beginning in 2014, with the implementation of Western sanctions and falling oil prices, refining volumes began to fall. In 2015, refining volume was around 280 million tons, but it has since declined. By 2019, the figure had skyrocketed to 11.25 million barrels per day, a record high.

Market capitalization is a key indicator of a company's economic health and investor appeal. This indicator is critical for oil companies, particularly those in large oil-producing countries such as Russia. The oil industry, one of the world's largest, has a significant impact on both global energy markets and the domestic economy. At the same time, it is critical to understand the factors that influence its capitalization to devise strategies to increase investment attractiveness and sustainability.

The COVID-19 pandemic and the subsequent drop in oil demand have resulted in a significant reduction in production. In April 2020, OPEC+ countries (including Russia) agreed to cut production to keep prices stable. Russia's oil production fell to approximately 10.27 million barrels per day in 2020.

Key factors can be classified as either global or domestic. Global factors include oil prices, international sanctions, and economic trends. World oil prices have a direct impact on company earnings because oil is the primary product of their operations. Price fluctuations can be caused by changes in supply and demand on global markets, geopolitical events, and decisions made by large cartels such as the Organization of Petroleum Exporting Countries. International sanctions imposed on Russia also have an impact because they may limit Russian companies' access to international capital markets.

2. Research methods

As methodological approaches we have chosen the theoretical approach, which includes the analysis of the received information and its synthesis, the second approach is the historical approach - the collection of historical data to determine the past, present and forecast the subsequent trends. The last approach is modeling, which consists in building econometric models in our research area, interpreting the results, and describing them.

In this article, we collected important factors related to any oil company to construct and describe a panel data regression model. To conduct a more accurate and comprehensive study, we decided to collect data for 12 years - annual figures in the balance sheet and consolidated financial statements from official company sources, as well as data from Yahoo! Finance, which include market capitalization, leverage, return on assets, return on equity, net assets, and EBITDA.

We chose 13 of Russia's largest oil producing and refining companies, including Gazpromneft, Lukoil, Rosneft, Surgutneftegaz, Tatneft, Bashneft, Slavneft, Bashneft, Novatek, Transneft, Russneft, Nizhnekamskneftekhim, Saratovneftegaz, and Varioganneft. These companies collectively account for more than 80% of Russia's oil exploration and production market.

According to the collected data, a balanced output was presented, and based on the results obtained, the following conclusions can be drawn: the data contains companies with high, medium and low capitalization, the highest indicator is 6.3 trillion rubles, the average is 1.3 trillion rubles, the lowest is 3.7 billion rubles – the average leverage value is 0.8. It is considered that the standard indicator in Russia is 1. The result indicates an increase in profitability for shareholders, but also increases the financial risks of the company. We took it with mean, standard deviation, minimum and maximum.

Many external factors influence the development and sustainability of the Russian oil sector. Geopolitical instability is one of the critical factors, having both direct and indirect effects on oil prices. For example, the imposing of sanctions against Russia in 2014 saw a massive drop in foreign investment in the oil sector, which affected productivity and exports. Another considerable factor is the state of the global economy, since the level of demand for oil is closely interrelated with spendable economic activity. Second case, the 2020 COVID-19 pandemic caused a very steep decline in oil demand leading prices to record declines including negative values. Sanctions imposed since 2014 have fundamentally altered the sector's investment dynamics, necessitating revised modeling approaches. Traditional capital expenditure models based on price-cost margins now require incorporation of geopolitical risk coefficients, as evidenced by the 40% reduction in foreign direct investment in greenfield projects post-2014. Panel data analysis of major Russian oil companies shows significant restructuring of supply chains, with Asian partners replacing Western technology providers - a shift that has increased project lead times by 15-20% while reducing average production efficiency by 7%. These structural changes demand new econometric specifications that account for non-market decision drivers in Russia's energy sector.

The oil sector is crucial for the Russian economy, accounting for a significant share of federal budget revenues and export earnings. In 2021, oil proceeds accounted for more than 30% of the federal budget, thereby emphasizing the dependency of the economy on this sector. The oil industry contributes about 10% to the Gross Domestic Product (GDP) of the country by giving employment and contributing towards the allied industries like transportation and refining.

Different econometric methods are deployed to analyze the influence that external factors have on the oil sector. One of the preferred methodologies happens to be regression analysis which quantifies the degree of influence of each factor. For instance, time series analysis could look into the dynamics of oil prices responding to changes in the geopolitical situation or economic processes. That will enable the identification of crucial dependencies and possible consequence drawing on changes in external factors.

Table 1 - Dependent and independent variables for regression analysis

<i>Name</i>	<i>Unit measure</i>	<i>Description</i>
<i>Market capitalization</i>	<i>Billion rubles</i>	<i>Market capitalization refers to the total market value of a company's issued shares. It is calculated as the product of one share's current market price and the total number of shares issued. This indicator is used to compare the size and value of a company to others on the stock market. It provides investors with an estimate of how much a company is worth in the current market.</i>
<i>Leverage</i>	<i>Point</i>	<i>The use of debt capital to fund a company's operations to boost its return on equity. It is calculated as the company's debt divided by its total assets. A high level of leverage can increase shareholder returns while increasing the company's financial risks.</i>
<i>ROA</i>	<i>Percentage</i>	<i>A financial indicator that measures how efficiently a company's assets are used to generate profit. ROA is calculated as the company's net income divided by its average total assets. It demonstrates how successfully a company manages its assets to generate profits.</i>
<i>ROE</i>	<i>Percentage</i>	<i>An indicator that assesses a company's profitability in relation to shareholder equity. ROE is calculated as the ratio of net income to the average shareholder equity. It demonstrates how effectively the company manages its own funds to generate profits.</i>
<i>Net Assets</i>	<i>Billion rubles</i>	<i>The difference between a company's total assets and total liabilities is known as its net assets. It is also known as equity and represents the amount that will remain with shareholders after all the company's debts have been repaid.</i>
<i>EBITDA</i>	<i>Billion rubles</i>	<i>A measurement of earnings before interest, taxes, depreciation, and amortization. EBITDA is used to measure a company's operating profitability because it excludes the effects of financial structure, tax policy, and depreciation and amortization accounting, allowing for comparisons between companies with different financial structures and tax regimes.</i>

3. Results

To determine the appropriate model between FE and RE, the Hausman test was applied. This test compares the coefficient estimates from both models and evaluates the null hypothesis that there is no systematic difference between them. The test statistic follows a generalized chi-squared distribution, where the difference between coefficient vectors is weighted by the inverse of their variance-covariance matrix:

$$H = (b - B)'[V(b) - V(B)]^{-1} (b - B)$$

where H – test statistics;

b - vector of estimated coefficients;

B - comparison vector of coefficients;

$(b - B)'$ - transposed difference of vectors;

In the initial specification, the test showed that the rank of the coefficient difference matrix was 4 instead of 5, indicating a potential issue with variable scaling. To address this, all variables were standardized (converted to Z-scores), after which the Hausman test yielded a p -value of 0.1022. This value exceeds the conventional significance threshold of 0.05, formally allowing the null hypothesis of coefficient equality to be accepted, thereby favoring the Random Effects model. However, the Hausman test is sensitive to model assumptions.

Fixed Effects model remains more robust. Therefore, while the RE model is statistically preferable, economic interpretation may still warrant the use of FE to avoid biased estimates.

Additionally, the Breusch–Pagan Lagrange Multiplier test (χ^2_{test0}) was conducted to assess the presence of random effects.

It confirmed that the error variance is significantly different from zero ($\chi^2 = 185.97$, $p < 0.001$), indicating the existence of intra-group correlation, which justifies the application of the RE model.

Figure 1 - Analysis of coefficients

```
. xtreg Market_cap Leverage ROA ROE Net_assets EBITDA, re vce(cluster ID)
```

Random-effects GLS regression	Number of obs	=	160
Group variable: ID	Number of groups	=	13
R-sq:	Obs per group:		
within = 0.5661	min =		8
between = 0.8024	avg =		12.3
overall = 0.7211	max =		13
corr(u_i, X) = 0 (assumed)	Wald chi2(5)	=	130.05
	Prob > chi2	=	0.0000
(Std. Err. adjusted for 13 clusters in ID)			

Market_cap	Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]	
Leverage	-16.87801	13.85359	-1.22	0.223	-44.03055	10.27454
ROA	1669.904	960.7804	1.74	0.082	-213.191	3552.999
ROE	-519.8761	622.4809	-0.84	0.404	-1739.916	700.1641
Net_assets	.2618738	.1940478	1.35	0.177	-.118453	.6422006
EBITDA	1.273256	.54204	2.35	0.019	.2108776	2.335635
_cons	241.7784	165.9014	1.46	0.145	-83.3823	566.9392
sigma_u	505.67003					
sigma_e	488.32931					
rho	.51744009	(fraction of variance due to u_i)				

From a practical standpoint, this suggests that, all else being equal, an increase in financial leverage (the ratio of debt to equity) by one unit is associated with an average decrease in market capitalization of approximately 16.88 units.

ROA (Return on Assets) - the coefficient for ROA is 1669.904, with a robust standard error of 960.7804. The positive and relatively large coefficient indicates a strong direct relationship between return on assets and market capitalization. The z-statistic is 1.74, and the p-value is 0.082, which is close to the conventional 0.05 threshold, suggesting marginal statistical significance at the 10% level.

This means that an increase in ROA by 1 percentage point is associated with an approximate increase of 1669.9 units in market capitalization. For example, if a company improves its asset utilization efficiency and raises its ROA from 5% to 6%, a substantial increase in market value may be expected. Investors tend to value a company's ability to generate profits relative to its asset base.

ROE (Return on Equity) - the coefficient for ROE is -519.8761, with a robust standard error of 622.4809. The negative sign suggests an inverse relationship between return on equity and market capitalization, which may appear counterintuitive. The z-statistic is -0.84, and the p-value is 0.404, indicating statistical insignificance.

Net Assets - the coefficient for Net_assets is 0.2618738, with a robust standard error of 0.1940478. The positive sign indicates a direct relationship between net assets and market capitalization. The z-statistic is 1.35, and the p-value is 0.177, which exceeds the conventional 0.05 significance level, indicating that the coefficient is not statistically significant at the 5% level.

Despite the lack of statistical significance, the positive coefficient aligns with economic intuition: an increase in net assets by one unit is associated with an average increase of 0.26 units in market capitalization. This may reflect the perceived value of a company's tangible assets to investors, although intangible assets often play a more prominent role in today's economy.

EBITDA - the coefficient for EBITDA is 1.273256, with a robust standard error of 0.54204. The positive sign indicates a direct relationship between EBITDA and market capitalization. The z-statistic is 2.35, and the p-value is 0.019, which is below the conventional 0.05 significance level, indicating statistical significance.

This is the only predictor in the model that is statistically significant at the 5% level. An increase in EBITDA by one unit is associated with an average increase of 1.27 units in market capitalization. For instance, if a company increases its EBITDA by \$1 million, its market value is expected to rise by approximately \$1.27 million. This underscores the importance of operational efficiency and cash flow generation for investors.

Constant term - the coefficient for the constant is 241.7784, with a robust standard error of 165.9014. The z-statistic is 1.46, and the p-value is 0.145, which exceeds the conventional significance

level of 0.05, indicating that the constant is not statistically significant. This means that the baseline level of market capitalization (when all predictors are zero) does not differ significantly from zero.

σ_u equals 505.67003, representing the variation between groups (companies) that is not explained by the predictors included in the model. σ_e is 488.32931, capturing the within-group variation. The ratio ρ , equal to 0.5174409, indicates that approximately 51.7% of the total unexplained variance is due to differences between companies. This value is close to 0.5, suggesting that both between-group and within-group variations contribute roughly equally to the total error variance.

Below is an analysis of the new model with only significant predictors and a comparison with the initial, larger model in the Figure 2.

Figure 3.5 – The best model of Random effect

```
. xtreg Market_cap Leverage EBITDA, re vce(cluster ID)
```

Random-effects GLS regression	Number of obs	=	160
Group variable: ID	Number of groups	=	13
R-sq:	Obs per group:		
within = 0.5211	min =		8
between = 0.7626	avg =		12.3
overall = 0.6723	max =		13
corr(u_i, X) = 0 (assumed)	Wald chi2(2)	=	34.61
	Prob > chi2	=	0.0000
(Std. Err. adjusted for 13 clusters in ID)			

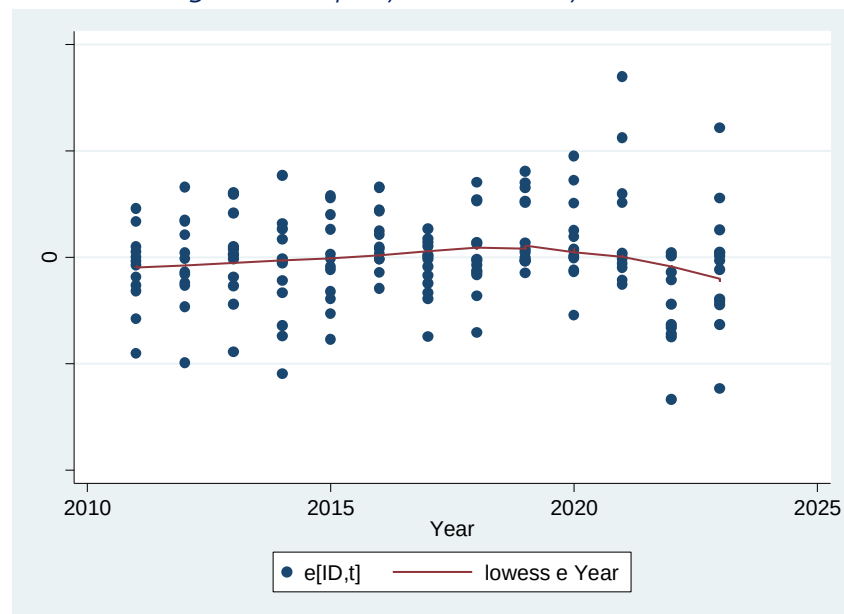
Market_cap	Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]
Leverage	-49.86282	11.8591	-4.20	0.000	-73.10624 -26.61941
EBITDA	1.841831	.3219811	5.72	0.000	1.21076 2.472903
_cons	443.1302	129.1559	3.43	0.001	189.9893 696.271
sigma_u	629.75855				
sigma_e	507.94194				
rho	.60585903	(fraction of variance due to u_i)			

The random effects model was estimated using generalized least squares (GLS) to analyze the impact of leverage and EBITDA on market capitalization across a panel of 13 companies, represented by 160 observations in an unbalanced dataset. The dependent variable, market capitalization (Market_cap), reflects a company's market value, while the independent variables include financial leverage (Leverage), measured as the debt-to-equity ratio, and EBITDA, a proxy for operational profitability. The model accounts for unobserved heterogeneity across companies through random effects, with robust standard errors clustered at the firm level to address potential intra-group correlation and heteroscedasticity.

The model exhibits strong explanatory power, capturing 52.11% of within-company variation, 76.26% of between-company variation, and 67.23% of overall variation in market capitalization. A statistically significant Wald test ($\chi^2 = 34.61$, $p < 0.001$) confirms the joint relevance of the predictors.

Leverage demonstrates a robust negative association with market capitalization: a 1-unit increase in leverage corresponds to a 49.86-unit decline in valuation ($p < 0.001$). This aligns with theories suggesting that excessive debt raises financial risk, deterring investors due to concerns about bankruptcy costs or constrained operational flexibility. Conversely, EBITDA shows a positive effect, with a 1-unit increase leading to a 1.84-unit rise in market capitalization ($p < 0.001$), underscoring the market's emphasis on operational efficiency and cash flow generation as indicators of financial health and growth potential. The constant term (443.13, $p = 0.001$) represents the baseline market valuation at zero leverage and EBITDA, serving as a theoretical reference point.

Figure 3 - Graph of distribution of residuals



The presented (see Figure 3) plot displays the distribution of residuals from the regression model (denoted as $e[ID,t]$) across years. The red line represents the nonparametric LOWESS curve (Locally Weighted Scatterplot Smoothing), which shows the overall trend of residual changes over time.

The residual plot is an important diagnostic tool for assessing the quality of the regression model, in this case, likely related to the results of the random effects model presented in the previous query. The plot shows that the residuals are distributed in both the positive and negative regions, ranging approximately from -2000 to +2000. This indicates the presence of both overestimated (negative residuals) and underestimated (positive residuals) values by the model. Most of the residuals are concentrated in the range from -500 to +500, indicating relatively moderate deviations of the predicted values from the actual values for most observations. The LOWESS curve (red line) demonstrates a weak nonlinear trend in the residuals over the period examined.

In the early period in 2011, the average residuals are slightly below zero, followed by a gradual increase in the average residuals to slightly positive values between 2013 and 2020, after which, from 2020 to 2024, the average residuals decrease back into the negative range. The presented results reflect an analysis of the impact of various financial indicators on companies' market capitalization using a random effects model for panel data. This model accounts for the grouped structure of the data, where observations are clustered by company identifiers (ID).

4. Conclusion

The analysis of historical data has shown that oil prices over a long period of time have undergone significant changes depending on the fluctuations of key players, time, global crises, political stability, and economic reforms. Periods of high oil prices were accompanied by an increase in capitalization, while declining prices often led to a decline in the value of public companies.

During the econometric analysis, the construction of suitable models and the tests carried out, we achieved the following results based on the hypotheses derived:

The growth of the company's leverage does not have a positive impact on the market capitalization. This is since companies with high leverage may face liquidity problems, which makes them more vulnerable to fluctuations in market conditions and changes in interest rates. Investors may view a high level of debt as a sign of increased risk, which may lead to a decrease in confidence in the company and a decrease in its market capitalization. A high level of debt increases the financial obligations of the company, which can lead to difficulties in fulfilling these obligations, especially during periods of economic instability. This limitation may hinder further growth and implementation of strategic initiatives.

Raising in the return on assets and equity does not lead to an increase in capitalization. The increase in return on assets may be caused by temporary factors or one-time events that do not necessarily indicate long-term sustainability and improvement in the company's operating activities. However, a high level of ROA does not always lead to profitable reinvested growth of the company or

payment of dividends to shareholders. Investors assess the risks associated with changes in the market environment and can be careful in their estimates and forecasts. At the same time, even with the growth of ROE, the company may face fierce competition or unfavorable conditions in the industry, which limits its opportunities for growth.

An increase in net assets leads to an increase in market capital. The growth of net assets indicates the financial stability of the company. This means that the company has enough of its own funds to cover its obligations, reducing the risk of bankruptcy and increasing investor confidence. This makes the company more attractive, pointing to potential opportunities for future investment and development. Investors see this as an opportunity for growth and stable dividend payments. In addition, the company's creditworthiness increases, which allows it to attract financing on more favorable terms. The presence of significant net assets indicates that the company has long-term stability and the ability to withstand economic downturns, which makes its shares more attractive and increases its market capitalization.

References

1. Ansari, D. (2017). OPEC, Saudi Arabia, and the shale revolution: Insights from equilibrium modeling and oil politics. *Energy Policy*, 111, 166–178. <https://doi.org/10.1016/j.enpol.2017.09.019>
2. Baumeister, C., & Peersman, G. (2013). The role of time-varying price elasticities in accounting for volatility changes in the crude oil market. *Journal of Applied Econometrics*, 28(7), 1087–1109. <https://doi.org/10.1002/jae.2283>
3. Behar, A., & Ritz, A. (2017). OPEC vs US shale: Analyzing the shift to a market-share strategy. *Energy Economics*, 63, 185–198. <https://doi.org/10.1016/j.eneco.2016.12.018>
4. Caldara, D., Cavallo, M., & Iacoviello, M. (2019). Oil price elasticities and oil price fluctuations. *Journal of Monetary Economics*, 103, 1–20. <https://doi.org/10.1016/j.jmoneco.2018.08.004>
5. Dvir, E., & Rogoff, K. (2009). Three epochs of oil (NBER Working Paper No. 14927). National Bureau of Economic Research. <https://doi.org/10.3386/w14927>
6. Golombek, R., & Irarrazabal, A. (2018). OPEC's market power: An empirical dominant firm model for the oil market. *Energy Economics*, 70, 98–115. <https://doi.org/10.1016/j.eneco.2017.12.012>
7. Huppmann, D. (2013). Endogenous shifts in OPEC market power: A Stackelberg oligopoly with fringe (DIW Discussion Paper No. 1313). German Institute for Economic Research. <https://doi.org/10.2139/ssrn.2319801>
8. John, C. B. (2003). Price elasticity of demand for crude oil: Estimates for 23 countries. *OPEC Energy Review*, 27(1), 1–8. <https://doi.org/10.1111/1468-0068.00007>
9. Kilian, L. (2009). Not all oil price shocks are alike: Disentangling demand and supply shocks in the crude oil market. *American Economic Review*, 99(3), 1053–1069. <https://doi.org/10.1257/aer.99.3.1053>
10. Kilian, L., & Murphy, D. P. (2012). Why agnostic sign restrictions are not enough: Understanding the dynamics of oil market VAR models. *Journal of the European Economic Association*, 10(5), 1166–1188. <https://doi.org/10.1111/j.1542-4774.2012.01080.x>
11. Rubio-Ramirez, J. G., Waggoner, D. F., & Zha, T. (2010). Structural vector autoregressions: Theory of identification and algorithms for inference. *The Review of Economic Studies*, 77(2), 665–696. <https://doi.org/10.1111/j.1467-937X.2009.00578.x>
12. Emerson, S. (2000). Recent oil price trends underscore OPEC's unwieldy market power. *Oil and Gas Journal*, 98(13), 89–90.
13. Greene, D. L., Jones, D. W., & Leiby, P. N. (1998). The outlook for US oil dependence. *Energy Policy*, 26(1), 55–69. [https://doi.org/10.1016/S0301-4215\(97\)00100-7](https://doi.org/10.1016/S0301-4215(97)00100-7)
14. Lynch, M. C. (2001). Oil prices enter a new era. *Oil and Gas Journal*, 99(50), 20–24.

STRUCTURAL SHIFTS IN GLOBAL PRODUCTION ACTIVITIES OF MNCs**Sevinc İbrahimova**

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<https://orcid.org/0009-0001-8177-3851>**Lale Mammadova**<https://orcid.org/0009-0006-7718-2043>**Behruz Rzayev**<https://orcid.org/0009-0001-8763-8175>**Abstract**

Structural shifts in the global economy are changing the nature and mode of international expansion of multinational enterprises (MNEs) and their role in global production. However, studies of their behavior usually rely on data on foreign direct investment flows, which do not provide a complete picture of MNEs' participation in host economies. We use the OECD AAMNE database and show that the use of statistics on MNEs' output allows us to better understand the structural shifts in their production activities. According to our estimates, the lack of offshoring (in particular, by Chinese MNEs) does not mean a limited presence in foreign markets, and the expansion of output outside the parent countries (for example, by MNEs in Germany, France, and the United States) does not always lead to the spread of global value chains in manufacturing industries. The results indicate the feasibility of using data on MNEs' participation in the output of home and host economies to analyze the ongoing structural shifts and assess the effectiveness of industrial policy instruments.

Keywords: MNCs, offshoring, reshoring, global value chains.

Introduction

After a long period of high rates of global growth in international trade and foreign direct investment (FDI), a significant slowdown in the dynamics of these processes has been observed in the last few years. Experts note signs of deglobalization and de-coupling [2], the trends towards which are supported by the strengthening of protectionist policies and the pursuit of national interests. At the same time, it is noted that today the world economy is highly interconnected, reflecting the so-called chained globalization, and it is expected that countries will continue to be interconnected, but this will occur against the backdrop of increasing competition. The increasing role of structural industrial policy and protectionism will not weaken the economic relationship between countries, but will lead to a change in its nature, a reconfiguration of global value chains (GVCs), a redistribution of economic forces and the migration of capital accumulation centers.

The shift in the growth poles of the global economy is usually associated with a slowdown in the growth of the technological potential of the United States, Japan, and some European countries and the strengthening of the economic potential of developing countries, led by China. However, after the global economic crisis of 2008–2009, globalization began to slow down, and some integration processes even reversed. The slowdown in globalization in recent years has been facilitated by the outbreak of the COVID-19 pandemic, the growth of international conflicts, and the active policy measures taken by developed and developing countries in response to these challenges.

In response to the ongoing changes, companies are transforming GVCs, including changing their geography and organization in such a way as to ensure sustainability and longevity. Behind the transformation of GVCs are multinational companies, which by definition generate 100% of FDI flows, determine more than half of global exports, almost a third of global GDP, and about a quarter of jobs. Over the past few decades, the growth rate of gross output of MNCs' foreign affiliates has increased faster than the growth rate of global GDP, and the sales of foreign affiliates have increased faster than

global exports (Figure 1). Accordingly, monitoring and measuring MNC activity serve as valuable tools in diagnosing the directions of global economic development.

Analysis of structural changes in FDI, a traditional indicator of MNC activity, allows us to discuss the maneuvering of the global economy and individual countries in the coordinates of globalization/deglobalization and industrialization/deindustrialization (see, for example: A study of the structure of outgoing FDI makes it possible to determine the expansion of offshoring of MNC production processes. However, the changes taking place in the global economy limit the suitability and usefulness of FDI analysis for assessing MNC activity. The development of digital technologies has led to the fact that MNCs often expand without making capital investments through new business models based on digital (virtual) presence, the behavior and profitability of foreign affiliates are determined not only by capital investments and standard factors of the gravity model, but also by the presence of intangible assets of the company, which are difficult to measure. Finally, the use of FDI data is useless if the MNC carries out reshoring, the popularity of which has significantly increased in recent years.

The purpose of the article is to discuss the possibilities of assessing the activity of MNCs, which is often considered unobservable, and to present the structural features of MNC activities in host economies. The study is based on the OECD AAMNE database, which seems to have great potential for obtaining significant results, but so far has rarely attracted the interest of experts. These results complement earlier evidence on the specificity of MNC activities collected using company surveys and specialized data, in particular with regard to reshoring to metropolitan or neighboring countries.

Discussion

CHANGING THE BEHAVIOR OF MNCS AND THE PROBLEMS OF ITS ASSESSMENT

In response to changing global economic conditions, MNCs are significantly restructuring the structure of their regional presence and the role of their foreign divisions, as well as the management structure, coordination strategies and integration of individual divisions, which is attracting increasing attention from researchers. The specifics of accounting for FDI statistics, as well as the increasing complexity of the organization and activities of MNCs, make the use of FDI data one of the useful, but insufficient sources of information on MNCs and structural shifts in global production and individual national economies. This is explained by the following circumstances.

First, the use of data on FDI flows can lead to biased estimates due to multiple counting, since foreign investments often pass through offshore zones and "transit points". By channeling financial resources through "tax havens", MNCs do not at all pursue the goals of producing and selling goods or services [28]. The glossary even included a special term "special purpose entities", that is, branches of MNCs with a low share of non-financial assets in total assets and a compact staff. Understanding this problem, experts have recently begun to exclude such enterprises from FDI statistics.

Secondly, the use of these data does not allow taking into account the attraction of MNCs of domestic investments in the host economy, which then form added value, but at the same time do not appear in any way in FDI statistics [28]. In addition, FDI reflect only the financial contribution of the investor, and, for example, human capital, which can play a decisive role in the economic success of a branch, remains outside the scope of observation. Finally, official FDI statistics cover not only firms, but also individual investors, although their share is insignificant in comparison with institutional investors.

As an illustration of the above factors, one can use empirical results that show that focusing on the indicators of accumulated FDI leads to an overestimation of the scale of MNC activities in countries with the status of a "tax haven", as well as to its underestimation in countries with developed capital markets, volatile exchange rates and high labor productivity in subsidiaries.

The response to the difficulties in assessing the activities of MNCs has been the emergence of special databases. Among them, the following can be distinguished:

1) Multinational Enterprise Information Platform – developed by the OECD jointly with the UN Statistics Division, contains global registers of physical and virtual (Internet sites) branches of 500 largest MNCs;

2) Full International and Global Accounts for Research in Input–Output Analysis (FIGARO) – a resource of the European Commission that aggregates information on generated employment, added value and carbon dioxide emissions from the export activities of European countries both within the EU itself and in the territories of major trading partners;

3) Analytical Activity of Multinational Enterprises (AAMNE) – developed by the OECD, allows for the disaggregation of international trade statistics, taking into account the activities of domestic and foreign MNCs on the territory of the country.

AAMNE is perhaps the most comprehensive database on the international activity of MNCs at present, but its use in empirical research is still limited and is presented mainly in preprints. Methodologically, the database is based on inter-industry input–output tables (OECD Inter-Country Input–Output Tables) with the nationality of companies involved in the production of goods and services identified. The threshold criterion for defining an MNC is a 50% share of foreign ownership, which in turn is subdivided into domestic and foreign, taking into account the country of operation of the market. In this regard, the criteria for identifying MNCs based on FDI data are more lenient (foreign share in equity capital of at least 10%). Enterprises in the AAMNE database with less than 50% foreign ownership are classified as domestic firms-non-MNCs. The 2023 version of the AAMNE database allows for the analysis of MNE activity patterns in 76 countries across 41 economic activities over the period 2000–2019, making it suitable for the purposes of this study.

STRUCTURAL CHANGES IN THE CONTRIBUTION OF MNCs TO GLOBAL PRODUCTION

The country structure of MNC output is significantly concentrated – MNCs from five countries (the USA, Germany, France, Japan and China) produce more than half of the gross output of all multinational companies. At the same time, while the total share of the leading countries has decreased slightly over the period under review, significant changes have occurred within it – the contribution of Chinese MNCs has increased fourfold (from 4% in 2000 to 19% by 2018), the contribution of Japanese MNCs has decreased by half (from 14 to 6%), and the contribution of American MNCs has decreased (from 30 to 22%). Other countries whose MNCs have been increasing their contribution to global output include Kazakhstan, Vietnam, and Nigeria, although their share in gross output remains small (0.3–0.5% in 2019).

In total, according to 2019 data, the contribution of the three countries with the largest share of MNCs in gross output (the United States, China, and Japan) accounts for almost half of the global total (47%), while the contribution of outward FDI stock from these countries does not exceed even a third of global investment. This observation, based on FDI flow data, once again highlights the significant bias in the contribution of MNCs from individual countries to global output. In the following analysis, we focus on MNCs from five countries (the United States, China, Japan, Germany, and France), which together were the leaders in terms of output within and outside their respective countries throughout the observed period.

The share of foreign production in MNC output (i.e. offshoring) grew until the global economic crisis of 2008–2009, and then plateaued at about 15%. This observation fits in quite well with other evidence of a freeze or slowdown in globalization since 2010.

Of the five countries under consideration that are leaders in the contribution of MNCs, only the United States began to show signs of a reduction in the contribution of foreign production to MNC output (i.e. reshoring) after 2015. MNCs from France and Germany demonstrated striking synchronicity in the accumulation of foreign output. At the same time, the key foreign market for both countries was the United States, and only slightly behind were China and the EU countries. Branches of German and French MNCs in China produced less output in 2015–2019 compared to 2010–2014.

It is difficult to formulate a clear trend with regard to the economic behavior of Chinese MNCs. The share of foreign affiliates in the gross output of Chinese MNCs remained at the same level throughout the period under review - about 5-6%. The scientific literature has paid much attention to the specifics of the market behavior of MNCs from developing economies, which are characterized by a combination of development in the domestic and foreign markets, while it is noted that a large domestic market is a priority in some cases. This is confirmed by UNCTAD data, according to which the value of assets of the 100 largest global non-financial MNCs outside their home economies in 2021 exceeded the value of assets located within the countries where their headquarters are located, while the 100 largest MNCs from emerging markets had more than twice as many assets inside their home economies as abroad. In terms of industry, the global structure of MNC output turned out to be extremely stable (over 20 years, the volatility of individual industries did not go beyond a few percent). The manufacturing industry accounted for 28–29% of the total output of MNCs; 9–10% – wholesale, retail trade and motor vehicle repair; 6–7% each – construction and real estate activities.

The contribution of MNCs to the output of manufacturing industries and its dynamics vary significantly across countries. First of all, it should be noted that the expansion of the output of manufacturing industries in China and the growth of their competitiveness in international markets were closely accompanied by the growth of Chinese MNCs in this sector. This is confirmed by the fourfold increase in their contribution to the output of all MNCs within the manufacturing industry – from 7% in 2000–2004 to 28% in 2015–2019. The contribution of MNCs to the output of these industries in the

other countries under consideration was declining, which was especially pronounced in the United States – from 23% in 2000–2004 to 14% in 2015–2019. and Japan – from 15 to 8% during the same periods, to a lesser extent – in Germany and France. It seems that the next wave of growth of the industrial complex in developed countries after a rather long period of servitization and deindustrialization of economies was not supported by their domestic MNCs (Table 1).

Table 1. Share of MNCs from China, the USA, Japan, Germany, France and other countries in the total output of all MNCs in the manufacturing industry, 2000–2019, %

	2000-2004	2005-2009	2010-2014	2015-2019
USA	23	19	15	14
China	7	12	21	28
Japan	15	12	9	8
Germany	8	7	6	6
France	4	4	3	3
Other countries	44	46	45	42

The obtained estimates allow us to identify the behavior patterns of MNCs and their contribution to home economies for the five largest home countries of MNCs. The first is typical for China - it can be called the industrial expansion of MNCs at the expense of the domestic market. Indeed, in the period under review, MNCs from China significantly (4 times) increased their contribution to the output of manufacturing industries, while the share of offshoring remained low and did not change. The second is typical for Germany and France - let's call it the decentralization model. MNCs moved production outside the home economies, while their contribution to the output of manufacturing industries did not decrease significantly. Finally, the third is typical for the USA and Japan - this is a restructuring model, namely a reduction in the contribution of MNCs to the output of manufacturing industries and a simultaneous increase in offshoring in the output of the MNCs themselves.

It is important to supplement the identified behavior patterns of MNCs and their participation in home economies with two observations. First, although MNCs from Germany, France, Japan, and the United States account for almost 40% of global MNC output and have increased their share of offshoring in manufacturing industries over the past two decades, global output from these industries has not become more distributed overall. In almost all manufacturing industries, the share of offshoring in MNC output has remained unchanged or increased slightly (Table 2).

Table 2. Share of offshoring in MNC output by manufacturing industry, 2000–2019, %

Industry	2000-2004	2005-2009	2010-2014	2015-2019
Food, Beverages and Tobacco	18	20	20	19
Textiles, clothing, leather and related products	12	15	16	15
Wood, wood products and cork	10	12	12	11
Paper products and printing	18	21	21	21
Coke and petroleum products	20	22	22	20
Chemicals and chemical products	31	37	38	37
Pharmaceuticals, medicinal chemicals and herbal products	49	53	53	50
Rubber and plastic products	24	28	28	26
Other non-metallic mineral products	23	24	21	19
Base metals	16	19	17	16
Hardware	13	16	16	16
Computer, electronic and optical products	33	42	48	47
Electrical equipment	24	31	30	29
Machines and equipment	22	27	27	26
Motor vehicles, trailers and semi-trailers	37	42	47	49
Other transport equipment	19	23	23	22
Other production; repair and installation of machinery and equipment	16	19	20	22

The share of offshoring is significant and has increased in the period under review in the production of motor vehicles, as well as computer, electronic and optical products. These are traditional industries in which GVCs have expanded in recent decades. Second, although Chinese MNCs, according to our results, have not demonstrated an expansion of output offshoring (in relative terms), their growth has been noticeable in a large number of foreign markets, where they have taken leading positions among MNCs from other countries (Table 3).

Table 3. Number of countries in which MNCs from China, the United States, Japan, Germany and France had the largest output (compared to each other)

	USA	China	Japan	Germany	France
2000-2004	34	3	17	12	6
2015-2019	25	25	0	18	4

While in the early 2000s Chinese MNCs were the leaders in terms of output in South Korea, Russia and Taiwan, in 2015–2019 they overtook Japanese MNCs in 16 countries, mostly in Asia and Africa, as well as US MNCs in five countries, including the “rest of the world” and Sweden. German corporations have displaced US corporations in four European countries, including Denmark, while US MNCs have only managed to outpace their competitors in Thailand over the past 20 years. And perhaps the most important and striking finding is the complete loss of dominant economic influence by Japanese MNCs (again, compared to the other four countries).

Although the calculations ignored market size, and Chinese MNCs have captured mostly relatively small developing economies, their success is still remarkable. It is not least connected with the “neighborhood” effect, when, for example, Chinese corporations have mastered the markets of other Asian countries, including due to their cultural similarity, convenient logistics, the presence of a diaspora and a lower technological level. The same set of factors played an important role for Indian, Brazilian and other South American MNCs. At the same time, expansion strategies in developed and developing markets differ significantly – business models that have proven successful in one of the developed markets are highly likely to be easily adapted to others, while individual developing markets (or at least their regional groups) require serious calibration of business processes. Thus, the expansion of Chinese MNCs into non-Asian markets may encounter barriers that lie outside the economic plane.

Conclusion

The activities of multinational companies are changing their nature and forms in response to modern global challenges. New data sources and alternative methods of their assessment are required to adequately describe and more accurately explain the structural shifts taking place in global production. In this paper, we used the OECD AAMNE database, which allows us to analyze shifts in the structure of MNC participation in global production. The results obtained confirm the existing observations that the use of data on FDI flows is insufficient to provide a comprehensive assessment of MNC participation in modern global production. The use of data on MNC output also allows us to look at the spread of global value chains from a different angle and confirm the standard observation that their most active formation over the past two decades has occurred in the automotive and computer and electronics industries. We also obtain estimates of the scale of production reshoring in the United States, which became noticeable in the data after 2015. This is consistent with a set of measures taken by the American authorities to return the capacities of MNCs headquartered in the United States from production offshoring zones.

At the same time, the obtained results allow us to identify some significant structural shifts in the international activity of MNCs that are not visible on the basis of data on the structure of FDI. We found that the share of foreign activity in the structure of Chinese MNCs’ output has not grown in the last two decades. However, at the same time, we observe a significant expansion of the presence of Chinese MNCs in a large number of foreign markets. This shows that Chinese MNCs, while maintaining a relatively small share of offshoring, have been growing intensively both in the domestic and foreign markets, increasing their contribution to the output of the manufacturing complex. Apparently, this was the result of many factors at once. During the period under study, the attitude of the Chinese authorities to outgoing FDI changed dramatically: from the proclamation of the slogan “Go outward” in the early 2000s to tightening control over FDI, shifting the focus of investment from developed markets to developing countries, mainly in Asia and Africa, in the mid-2010s. The calculations performed demonstrated the success of this strategy – Chinese MNCs began to dominate Asian markets and strengthened their positions in other regions without losing stability due to the preservation of key production processes within the country.

The considered example of analyzing the role of Chinese MNCs in domestic and global production demonstrates that using data on the contribution of MNCs to gross output helps to better understand the organization of their activities. This is extremely important for prospective studies, since it allows, for example, to analyze the impact of industrial policy and its individual instruments on the behavior of domestic and foreign multinational companies, including incentives for expanding their production within the country and abroad.

References

1. Ahn J., Park J.-H. Contracting with Enemies? Vertical FDI with Outsourcing Contracts. *International Economic Journal*, 2023, vol. 37, iss. 3, pp. 359-386. Available at: <https://doi.org/10.1080/10168737.2023.2242844>
2. Witt M. A., Li P. P., Välikangas L., Lewin A. Y. De-globalization and Decoupling: Game Changing Consequences? *Management and Organization Review*, 2021, vol. 17, iss. 1, pp. 6-15. Available at: <https://doi.org/10.1017/mor.2021.9>
3. Orucov M.M, Characteristics of preparatory measures for membership in the World Trade Organization, *Scientific and Pedagogical News of Odlar Yurdu University*, 2019, № 51, ISSN: 1682-9123 DOI: 10.0318/OYU.2023735552
4. Orucov M.M, Modern development model of the national economy, *Scientific and Pedagogical News of Odlar Yurdu University*, 2020, № 54, ISSN: 1682-9123 DOI: 10.0318/OYU.2023735552
5. Orucov M.M, Diagnostiks of the main therats to agro-food industry and food safety, *Scientific and Pedagogical News of Odlar Yurdu University*, 2020, № 58, ISSN: 1682-9123 DOI: 10.0318/OYU.2023735552
6. Walter S. The Backlash against Globalization. *Annual Review of Political Science*, 2021, vol. 24, pp. 421-442. Available at: <https://doi.org/10.1146/annurev-polisci-041719-102405>
7. Orucov M.M, Analysis of the current state of the oil industry processing network and the modern state of marketing in this field, *International Scientific Conference on the topic "IV Industrial Revolution and Digitalization of the Economy"* Odlar Yurdu University, 2023
8. Orucov M.M, The level of organization of the oil and gas complex in the modern era, "IV sənaye inqilabı və iqtisadiyatın rəqəmsallaşdırılması" *IV Industrial Revolution and Digitalization of the Economy* Odlar Yurdu University, 2023
9. Orucov M.M, Analysis of structural changes in the national agricultural sector and assessment of import dependence, *Scientific and Pedagogical News of Odlar Yurdu University*, 2023, № 62, ISSN: 1682-9123 DOI: 10.0318/OYU.2023735552
10. Orucov M.M, Assessment of the level of readiness of Azerbaijan's agri-food market on the eve of WTO accession, *Scientific and Pedagogical News of Odlar Yurdu University*, 2023, № 62, ISSN: 1682-9123 DOI: 10.0318/OYU.2023735552
11. Orucov M.M. Modernization of marketing improvement in the oil refining industry in Azerbaijan, *Scientific and Pedagogical News of Odlar Yurdu University*, 2023, № 62, ISSN: 1682-9123 DOI: 10.0318/OYU.2023735552
12. Orucov M.M. Prospects for the development of marketing in the management of market processes in the oil refining sector, *Scientific and Pedagogical News of Odlar Yurdu University*, 2023, № 62, ISSN: 1682-9123 DOI: 10.0318/OYU.2023735552
13. Orucov M.M. Diagnostics of the agri-food market and main threats to food security in the Republic of Azerbaijan, *Scientific and Pedagogical News of Odlar Yurdu University*, 2023, № 62, ISSN: 1682-9123 DOI: 10.0318/OYU.2023735552
14. Orucov M.M. Civil-legal contractual relations in business activities, *Scientific and Pedagogical News of Odlar Yurdu University*, 2023, № 62, ISSN: 1682-9123 DOI: 10.0318/OYU.2023735552
15. Orucov M.M. Import substitution in the agri-food sector in Azerbaijan, Heydar Aliyev-100. Import substitution, localization of production. Sustainable and preventive development. OYU. Scientific research work
16. Orucov M.M. Fundamentals of National Security of the Republic of Azerbaijan, Textbook -2024
17. Orucov M.M. The Wreath of Victory, a book dedicated to Mr. Ilham Aliyev's 20 years as President-2024
18. Orucov M.M. Parameters for long-term forecasting of the world economy, *Scientific and Pedagogical News of Odlar Yurdu University*, 2023, № 63, ISSN: 1682-9123 DOI: 10.0318/OYU.2023735552
19. Orucov M.M. Azerbaijani economy during Ilham Aliyev's presidency: a long way traveled in 20 years, *Scientific and Pedagogical News of Odlar Yurdu University*, 2023, № 63, ISSN: 1682-9123 DOI: 10.0318/OYU.2023735552
20. Orucov M.M. Theoretical and methodological aspekts, characterizing innovative development of the agricultural industry, *Scientific and Pedagogical News of Odlar Yurdu University*, 2023, № 63,

ISSN: 1682-9123 DOI: 10.0318/OYU.2023735552

21. Orucov M.M. *Foreign experience in stimulating the development of innovation activity in agriculture*, Scientific and Pedagogical News of Odla Yurdu University, 2023, № 63, ISSN: 1682-9123

DOI: 10.0318/OYU.2023735552

22. Orucov M.M. *The concept of the "energy trilemma" as an expression of the energy aspect of sustainable development of Azerbaijan*, International Conference on Smart Environment and green Technologies ICSGET2024, Springer. ISBN 978-3-031-81563-8 https://doi.org/10.1007/978-3-031-81564-5_43

23. Orucov M.M. *"Green economy" in the Republic of Azerbaijan: prerequisites and directions of development*, International Conference on Smart Environment and green Technologies ICSGET2024, Springer ISBN 978-3-031-81567-6 <https://doi.org/10.1007/978-3-031-81567-6>

24. Orucov M.M. *Algorithm for determining priority directions of innovative development of agricultural production*, XV International Scientific and Practical Conference «New problems of science and ways of their solution», October 22-23, 2024, Paris. France, ISBN 978-91-65423-91-6.

DOI <https://doi.org/10.5281/zenodo.14003470>.

25. Orucov M.M. *Analysis of structural change in the national agricultural field and assessment of dependence imports*, XV International scientific conference Madrid Spain 29-30/ 10/2024, ISBN 978-91-65423-92-3 DOI <https://doi.org/10.5281/zenodo.14040024>

26. Orucov M.M. *Monetary stabilization policy the financial crisis*, XIV international scientific conference. Tokyo. Japan. 31.10-01.11.2024 ISBN 978-92-44514-26-9 DOI <https://doi.org/10.5281/zenodo.14046748>

27. Orucov M.M. *Level of organization of oil and gas refining complex in the modern period*, XVI international scientific conference. Manchester United. 05-06.11.2024, ISBN 978-91-65423-93-0

DOI <https://doi.org/10.5281/zenodo.14091395>

28. Orucov M.M. *Analysis of foreign investment in Azerbaijani economy and directions to increase*, XVII International Scientific Conference. Dortmund. Germany. 07-08.11.2024, ISBN 978-92-44514-27-6

DOI <https://doi.org/10.5281/zenodo.14136799>

29. Orucov M.M. *The role of oil and gas resources in ensuring socio-economic development of the Republic of Azerbaijan*, Norwegian Journal of development of the International Science No 144/2024, ISSN 3453-9875

30. Orucov M.M. *The role of the oil sector in ensuring sustainable development of the economy of Azerbaijan*, German International Journal of Modern Science, 2024 No92, ISBN 978-92-44514-27-6

DOI <https://doi.org/10.5281/zenodo.14136799>

31. Orucov M.M. *Formation of the consumer market in the Republic of Azerbaijan as a factor in ensuring food security*, XII International Scientific Conference Beijing China. 12-13.11.2024,

ISBN 978-91-65423-94-7

DOI <https://doi.org/10.5281/zenodo.14178599>

32. Orucov M.M. *The role of the consumer market in ensuring food safety of the Republic of Azerbaijan*, The scientific heritage No 149 (2024) ECONOMIC SCIENCES, ISSN 9215 — 0365

33. Orucov M.M. *Diversification of economy the Republics Azerbaijan on the base sustainable development of non-oil sector*, XIV international scientific conference. Toronto. Canada. 14-15.11.2024, ISBN 978-92-44514-28-3 DOI <https://doi.org/10.5281/zenodo.14199182>

34. Orucov M.M. *Elements of credit policy and stimulation of credit investments in the real economy*, Sciences of Europe (Praha, Czech Republic) No 153 (2024, ISSN 3162-2364

35. Orucov M.M. *Efficiency problems of the energy sector of Azerbaijan in the background of the green economy*, XVII international scientific conference. Philadelphia. USA. 21-22.11.2024, ISBN 978-92-44514-22-1 DOI <https://doi.org/10.5281/zenodo.13929032>

36. Orucov M.M. *Current status of education in the Republic of Azerbaijan in the context of global education challenges*, XII international scientific conferences Roma, Italy. 19-20. 2024, ISBN 978-91-65423-95-4 DOI <https://doi.org/10.5281/zenodo.14218224>

37. Orucov M.M. *Increasing the competitiveness of agricultural production*, XIX International Scientific Conference. London. UK. 12-13.12.2024, ISBN 978-92-44514-32-0

DOI <https://doi.org/10.5281/zenodo.14518424>

38. Orucov M.M. *Priority directions of state regulation of the agricultural and food market*, XVI International Scientific Conference Madrid. Spain 17-18 2024, ISBN 978-91-65423-92-3

DOI <https://doi.org/10.5281/zenodo.14040024>

39. Orucov M.M. *Concept, theories and legal basis of the succession of states*, XIII International Scientific Conference Beijing China. 30-31.12. 2024, ISBN 978-91-65424-01-2
DOI <https://doi.org/10.5281/zenodo.14609837>
40. Orucov M.M. *Civil legal contractual relations in the field of entrepreneurial activity in the Republic of Azerbaijan*, XVIII international scientific conference - Philadelphia. USA. 09-10.01.2025, ISBN 978-92-44514-36-8 DOI <https://doi.org/10.5281/zenodo.14646632>
41. Orucov M.M. *Evaluation of the membership process of the Republic of Azerbaijan to the world trade organization*, XIII international scientific conference. Toronto. Canada. 14-15.01.2025, ISBN 978-91-65424-03-6 DOI <https://doi.org/10.5281/zenodo.14699449>
42. Orucov M.M. *Impact of the oil and gas industry on the economy of the Azerbaijan Republic*, XV international scientific conference. Vienna. Austria. 16-17.01.2025, ISBN 978-92-44514-37-5
DOI <https://doi.org/10.5281/zenodo.147182310>
43. Orucov M.M. *New trends and challenges to the global economy*, XIV international scientific conference. Stockholm. Sweden. 21-22.01.2025, ISBN 978-91-65424-04-3 DOI <https://doi.org/10.5281/zenodo.14749265>
44. Orucov M.M. *Methods of assessing the impact of education on economic growth*, XVIII international scientific conference. Tallinn. Estonia. 23-24.01.2025, ISBN 978-92-44514-38-2
DOI <https://doi.org/10.5281/zenodo.14754776>
45. Orucov M.M. *Reducing transaction costs in the digital economy*, XVII International Scientific and Practical Conference 28-29. 01. 2025, Paris. France, ISBN 978-91-65424-05-0
DOI <https://doi.org/10.5281/zenodo.14794434>
46. Orucov M.M. *Artificial systems in today's economic environment*, XIX international scientific conference. Dortmund. Germany. 13-14.02.2025, ISBN 978-92-44514-41-2
DOI <https://doi.org/10.5281/zenodo.14894330>
47. Orucov M.M. *Forecast of global economy development*, I international scientific conference. Marseille. France. 20-21.02.2025, ISBN 978-92-44514-42-9 DOI <https://doi.org/10.5281/zenodo.14932296>
48. Orucov M.M. *Application of money supply targeting regime within the framework of monetary policy*, I international scientific conference. Seoul. South Korea. 06-07.03.2025, ISBN 978-92-44514-44-3
DOI <https://doi.org/10.5281/zenodo.15020702>
49. Orucov M.M. *Prospects for the formation of economic multipolarity*, I international scientific conference. Helsinki. Finland. 13-14.03.2025, ISBN 978-92-44514-45-0
DOI <https://doi.org/10.5281/zenodo.15075323>
50. Orucov M.M. *Prospects for international settlements in digital currencies of Central Banks on a platform basis in foreign countries and Azerbaijan*, XVIII International Scientific and Practical Conference. Paris. France. 18-19.03.2025, ISBN 978-91-65424-12-8 DOI <https://doi.org/10.5281/zenodo.15095044>
51. Orucov M.M. *Global dynamics of socially responsible investing (SRI): analysis motivating MNCS to use SRI strategies*. XVIII international scientific conference. Madrid. Spain. 25-26.03.2025.
52. Orucov M.M. *Formation of investment climate in the oil and gas industry of Azerbaijan and its impact of the development of the non-oil sector*. I international scientific conference. **Singapore. Singapore. 01-02.04.2025.** ISBN 978-91-65424-14-2 DOI <https://doi.org/10.5281/zenodo.15165189>
53. Orucov M.M. *Economic effect of foreign direct investments in the oil and gas sector of Azerbaijan*. XVI international scientific conference. Vienna. Austria. 03-04.04.2025
54. Orucov M.M. Ibrahimova S.R. *Diversification of the non-resource sector of the economy of the Republic of Azerbaijan based on sustainable development and analysis of the experience of foreign countries in this area*. I international scientific conference, **Brussels. Belgium. 15-16.04.2025.** ISBN 978-91-65424-16-6 DOI <https://doi.org/10.5281/zenodo.15256023>
55. Orucov M.M. Ibrahimova S.R., *Mechanisms of international financial relations in the conditions of the globalization crisis*, I international scientific conference. Lisbon. Portugal. 22-25. 2025, ISBN 978-91-65424-17-3 DOI <https://doi.org/10.5281/zenodo.15305608>
56. Orucov M.M. *Digitalization of international settlements: Tradecoin vs US dollar*. II international scientific conference. Sydney. Australia. 15-16.05.2025. ISBN 978-92-44514-54-2 DOI <https://doi.org/10.5281/zenodo.15473751>

57. Orucov M.M, *Azerbaijan's economy in the new international realities*, II international scientific conference. Helsinki. Finland. 29-30.05.2025, ISBN 978-92-44514-56-6 DOI <https://doi.org/10.5281/zenodo.15622437>
58. Orucov M.M, *World trade in the conditions of the globalization crisis*, XX international scientific conference. Philadelphia. USA. 12-13.06.2025, ISBN 978-92-44514-58-0 DOI <https://doi.org/10.5281/zenodo.15691366>
59. Orucov M.M, *Crowdfunding as a financing tool a conceptual analysis*, II international scientific conference. Singapore. SINGAPORE. 17-18.06.2025, ISBN 978-91-65424-25-8 DOI <https://doi.org/10.5281/zenodo.15773933>
60. Orucov M.M, *State Policy on Green Economy in Azerbaijan*, II nternational Conference on Smart Environment and green Technologies İCSGET2025,
61. Orucov M.M, *Public investment and global economic resilience*, II international scientific conference. Lisbon. Portugal. 08-09.07.2025, ISBN 978-91-65424-28-9 DOI <https://doi.org/10.5281/zenodo.15861641>
62. Orucov M.M, *Energy relocation in the context of the change in the international economic paradigm*, XVIII nternational Conference. Tokio, Yapan. 10-11.07.2025. ISBN 978-92-44514-58-0 DOI <https://doi.org/10.5281/zenodo.16087743>
63. Orucov M.M. *Directions for improving the new insurance consortium for the development of agricultural leasing in the Republic of Azerbaijan*, Scientific and Pedagogical News of Odlar Yurdu University, 2018, № 49, ISSN: 1682-9123 DOI: 10.0318/OYU.2023735552
64. Orucov M.M, *The current state of the Azerbaijani economy against the backdrop of changes in the world economy*, Scientific and Pedagogical News of Odlar Yurdu University, 2018, № 50, ISSN: 1682-9123 DOI: 10.0318/OYU.2023735552
65. Orucov M.M, *Directions of development of export-oriented agriculture*, Odlar Yurdu University *Integration of territories liberated from occupation after the Patriotic War into the Azerbaijani Economy: a conceptual view*. Materials of the Republican Scientific-Practical Conference, February 10, 2021

Geographical sciences

CONTEMPORARY CHANGES IN THE MAIN CLIMATIC CHARACTERISTICS IN THE TERRITORY OF THE KABARDINO-BALKAR REPUBLIC

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Abstract

Climate is one of the most important characteristics of the natural environment, so the study of global climate changes is an urgent task of scientific and practical problems.

The climate of the Kabardino-Balkarian Republic, rich in diverse natural landscapes and distinguished by climatic diversity, is formed under the influence of a number of climate-forming factors and processes.

The purpose of this article is to study climate changes in various climatic zones of the KBR based on primary observations at three meteorological stations located in the steppe (Prokhladnaya), foothill (Nalchik) and mountain (Terskol) zones.

As a result of the studies conducted for the period 1961-2024, it was found that the average temperature has a positive growth trend in all seasons and the year as a whole in the steppe and foothill zones, linear trends are statistically significant. In the mountain zone, the angular coefficient of the linear trend is positive in all seasons, but statistically significant only in the summer season and the year as a whole.

The conducted analysis of the anomalies of the average temperature of the 2024 seasons showed that at the Prokhladnaya and Nalchik m/stations, positive anomalies of average temperatures were observed in all seasons except autumn. At the Terskol m/station, positive anomalies were observed only in spring and summer. In contrast to the trends in average temperatures, all trends in precipitation amounts are statistically insignificant; there are both positive and negative trends. The analysis of the anomalies of precipitation amounts for 2024 showed predominantly negative anomalies in the winter and summer seasons in the foothill zone, in the spring and summer seasons in the mountain zone.

Keywords: temperature, precipitation, anomaly, climate zone, trend

We are currently witnessing unprecedented climate change, which manifests itself in abnormal weather events, rising sea levels and melting glaciers. Winters have become warmer, and summers do not spoil us with an abundance of sunny days. The Earth's climate has been changing especially quickly over the past century. Since the beginning of the 20th century, the global surface air temperature has increased by 1.2°C. Climate change in Russia has a number of important features. [1]. Roshydromet reports [2] note that since the 1980s, each decade has been warmer than the previous one, and if we analyze the 10 warmest years in the entire history of observations, 9 of them have already occurred in the 21st century. Over the past decade, the planet has warmed by 0.17-0.18°C on average, and by 0.48°C in Russia, and if we take the northern territories of Russia, the temperature there has risen by 1.2°C, which is due to the length of the territory of the Russian Federation and the diversity of its natural and climatic features.

The Kabardino-Balkarian Republic (KBR) is located in the central part of the North Caucasus and occupies an area of 1247 sq. km. The climate on the territory of the republic is diverse due to vertical zonality, from 149 meters above sea level in the lowlands to 5642 meters at the top of Elbrus. It is formed under the influence of circulation processes of the southern zone of temperate latitudes. Cold arctic, dry continental Asian air masses invade the territory. Tropical air is also brought in from the Mediterranean basins. According to climatic conditions, the territory of the Kabardino-Balkarian Republic can be divided into three zones: flat with an altitude of less than 500 m above sea level, foothill with an altitude of 500

to 1000 m above sea level, and mountainous - more than 1000 m above sea level. Each of these territories is characterized by its own temperature and precipitation regime [3].

In the flat and foothill zones, a humid continental climate is common, which in the mountains changes to a subalpine climate. And then in the highlands it turns into an alpine type of climate. The average January temperature is from -2.0°C (on the plain) to -12.0°C (in the mountains), July, respectively, $+25.0^{\circ}\text{C}$ and $+5.0^{\circ}\text{C}$. The average annual precipitation is from 500 to 2000 mm. Climate change studies in the KBR have been conducted for a long time and many scientific papers are devoted to this issue. The works [4-7] study the climatic features of the foothill, steppe and mountain zones of the Kabardino-Balkarian Republic.

This article considers changes in the surface air temperature and precipitation at three meteorological stations of the KBR located in different climatic zones for the period from 1961 to 2024, as well as anomalies for 2024. The analysis of the variability of the average temperature and precipitation amounts was carried out both on annual and seasonal data.

Temperature and precipitation anomalies are deviations from the average values for the period 1991-2020 of these meteorological quantities. Anomalies can be caused by various factors, including atmospheric circulation, ocean currents, terrain and others.

Table 1 shows the main climatic characteristics at the considered meteorological stations.

Table 1

Temperature regime, precipitation regime and anomalies for 1961-2024

	year	winter	spring	summer	autumn
M/station Prokhladnaya					
Average temperature (1961-2024)	10,7	-1,5	10,6	22,7	11,0
Standard deviation (1991-2020)	0,9	1,7	1,1	1,1	1,3
Norm (1991-2020, base period)	11,1	-1,0	10,9	23,3	11,2
Average anomaly (1961-2024)	-0,4	-0,5	-0,3	-0,6	-0,2
Trend slope, (1961-2024) $^{\circ}\text{C}/10$ year	0,35	0,45	0,32	0,5	0,3
Total precipitation (1961-2024)	480,7	67,0	136,7	176,2	100,3
Standard deviation (1991-2020)	99,4	20,7	45,1	56,0	53,5
Norm (1991-2020, base period)	490,6	71,0	142,4	163,2	113,2
Average anomaly (1961-2024)	-9,9	-4,0	-5,4	12,4	-12,9
Trend slope, (1961-2024) mm/10 year	0,9	0,62	0,2	-6,6	6,8
M/station Nalchik					
Average temperature (1961-2024)	10,0	-1,6	9,7	21,3	10,5
Standard deviation (1991-2020)	0,8	1,7	1,1	1,0	1,3
Norm (1991-2020, base period)	10,5	-1,1	10,1	21,9	10,9
Average anomaly (1961-2024)	-0,5	-0,5	-0,4	-0,6	-0,4
Trend slope, (1961-2024) $^{\circ}\text{C}/10$ year	0,4	0,5	0,3	0,5	0,3
Total precipitation (1961-2024)	630,0	70,6	194,4	227,6	137,1
Standard deviation (1991-2020)	120,3	21,7	47,5	74,3	61,8
Norm (1991-2020, base period)	633,8	70,0	191,3	231,3	140,8
Average anomaly (1961-2024)	-3,8	0,6	1,5	-4,4	-4,5
Trend slope, (1961-2024) mm/10 year	-6,7	-2,0	-5,2	-0,4	2,69
M/station Terskol					
Average temperature (1961-2024)	2,7	-6,5	1,9	11,6	3,7
Standard deviation (1991-2020)	0,7	1,7	1,1	0,8	1,1
Norm (1991-2020, base period)	2,7	-6,6	1,9	12,0	3,6
Average anomaly (1961-2024)	0,0	0,2	0,0	-0,4	0,1
Trend slope, (1961-2024) $^{\circ}\text{C}/10$ year	0,12	0,07	0,1	0,34	0,03
Total precipitation (1961-2024)	969,9	160,3	257,8	293,6	255,3
Standard deviation (1991-2020)	164,2	61,3	85,5	62,1	91,2
Norm (1991-2020, base period)	992,9	158,7	269,7	296,8	269,2
Average anomaly (1961-2024)	-35,0	1,6	-13,7	-3,2	-17,0
Trend slope, (1961-2024) mm/10 year	3,34	0,37	9,7	-6,8	5,47

* statistically significant trends are highlighted in bold (5% level, $D > 7\%$)

Studies of the temperature regime at the Prokhladnaya station, located in the steppe zone at the junction of the Terek-Kuma Lowland and the Terek Range at an altitude of 198 m above sea level, showed that the average annual temperature for 1961-2024 was 10.7°C with a climatic norm of 11.1°C . In the period 1961-2024, a statistically significant increase in average annual temperatures was $0.35^{\circ}\text{C} / 10$ years, with a trend contribution to the explained variance of 44%, which occurred as a result of a significant increase in all seasonal average temperatures. According to the magnitude of the growth rate of the average temperature, the summer season ($0.5^{\circ}\text{C}/10$ years, $D=53\%$) and the winter season ($0.45^{\circ}\text{C}/10$ years, $D=19\%$) stood out. The average anomaly for the period under review had negative

values in all seasons and in the year as a whole. The annual precipitation amount at the Prokhladnaya station is 480.7 mm, the highest precipitation amount falls in the summer season - 176.2 mm, followed by spring (136.7 mm) and autumn (100.3 mm). The trend angular coefficients are positive in all seasons except spring, but are statistically insignificant. At the Nalchik station, located in the foothill zone between the Pastbishchny and Tersky ridges at an altitude of 493 m above sea level, for the studied period from 1961 to 2024, the average annual temperature was 10.0°C, with a climatic norm of 10.5°C. Just as in Prokhladnaya, a statistically significant increase in average annual temperatures was observed. The angular coefficient is positive, statistically significant. According to the rate of increase of the average temperature, the winter and summer seasons were distinguished (0.5°C/10 years, with $D=20\%$ and $D=52\%$, respectively). Average seasonal anomalies had exclusively negative values.

The annual precipitation in Nalchik is 630.0 mm, the highest value falls on the summer season (227.6 mm), followed by spring and autumn seasons. The lowest value of precipitation falls on the winter season (70.6 mm)

The angular coefficient of the trend is negative and insignificant in all seasons and in the year as a whole, which indicates a decrease in the amount of precipitation in the steppe zone.

The average annual temperature for 1961-2024 and the climatic norm at the Terskol station, located in the mountainous zone in the Elbrus region, between the slope of Mount Cheget and the Terskol gorge at an altitude of 2144 m above sea level, was 2.7°C. The growth rate of the average annual temperature increased to 0.12°C/10 years, and the contribution of the trend to the explained variance also increased ($D=11\%$). Average seasonal anomalies are positive except for the summer season.

Terskol station is characterized by a fairly high amount of precipitation falling during the year. Moreover, the greatest amount of precipitation falls in the summer season – 293.6 mm, the least in the winter season – 160.3 mm. The angular coefficients of the linear trend are positive and insignificant in all seasons except summer.

According to the World Meteorological Organization, 2024 was the warmest year in the history of meteorological observations [2]. In this regard, the analysis of temperature anomalies and precipitation amounts in the KBR in 2024 is of interest.

The conducted analysis of the anomalies νT of the average temperature in comparison with the standard deviation σ of the corresponding values of the seasons of 2024. showed that in all seasons except autumn, at all the considered metropolitan stations, positive anomalies of average temperatures were observed with an excess of interannual variability from 1σ to 1.69σ (pink cells), and at the Prokhladnaya station in the summer season there was an excess of 1.69σ to 3σ (orange cells) (Table 2). The exception is the Terskol metropolitan station in the winter season, where no excess of interannual variability was observed.

Table 2

Average annual (January-December) and seasonal anomalies of surface air temperature for metropolitan stations in 2024: νT – deviations from the norm (average for 1991-2020); σ – standard deviation for 1991-2020

M/station	year		winter		spring		summer		autumn	
	$\nu T, ^\circ\text{C}$	$\sigma, ^\circ\text{C}$	$\nu T, ^\circ\text{C}$	$\sigma, ^\circ\text{C}$	$\nu T, ^\circ\text{C}$	$\sigma, ^\circ\text{C}$	$\nu T, ^\circ\text{C}$	$\sigma, ^\circ\text{C}$	$\nu T, ^\circ\text{C}$	$\sigma, ^\circ\text{C}$
Prokhladnaya	1,7	0,9	1,9	1,7	1,6	1,1	2,4	1,1	1,3	1,3
Nalchik	1,5	0,8	2,7	1,7	1,5	1,1	2,0	1,0	0,5	1,3
Terskol	1,0	0,7	1,6	1,7	1,7	1,1	1,0	0,8	0,0	1,1

* positive anomalies $> \sigma$ are highlighted in red, orange and pink and in bold

Figure 1 shows the anomalies of average temperatures in 2024 relative to the 1991-2020 climate norm. As can be seen from Figure 1, positive anomalies are observed at all stations in all seasons and the year as a whole, except for the autumn season at the Terskol station, where a slight negative anomaly is observed (-0.02°C).

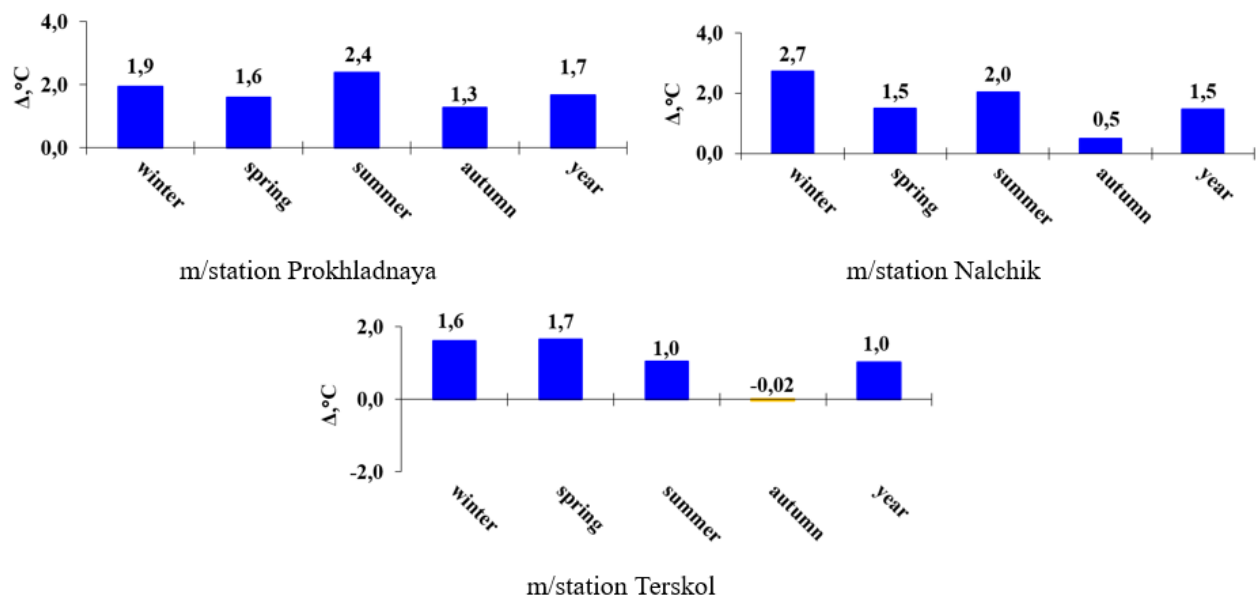


Figure 1. Anomalies of seasonal average temperatures for 2024 relative to climate norms for 1991-2020

Table 3 presents the precipitation anomaly data for the seasons of 2024, from which it is clear that in 2024 there was a deficit of precipitation in the winter season at the Nalchik m/station from 1σ to 1.69σ (blue cells), in the spring season at the Terskol m/station from 1σ to 1.69σ and in the summer season at the Nalchik and Terskol m/stations from 1σ to 1.69σ and from 1.69σ to 3σ , respectively.

Table 3

Annual (January-December) and seasonal precipitation anomalies for m/stations in 2024:
 Δ – deviations from the norm (average for 1991-2020); σ – standard deviation for 1991-2020

M/station	year		winter		spring		summer		autumn	
	Δ, mm	σ, mm	Δ, mm	σ, mm	Δ, mm	σ, mm	Δ, mm	σ, mm	Δ, mm	σ, mm
Prokhladnaya	-13,2	99,4	-3,4	20,7	-14,7	45,1	-33,1	56,0	-3,9	53,5
Nalchik	-11,5	120,3	-25,0	21,7	-42,7	47,5	-112,6	74,3	46,7	61,8
Terskol	-319,7	164,2	37,8	61,3	-125,9	85,5	-116,4	62,1	-39,7	91,2

** negative anomalies in absolute value $>\sigma$ are highlighted in blue and light blue

Figure 2 shows the anomalies of seasonal precipitation amounts in 2024 relative to the 1991-2020 climate norm. As can be seen from Figure 2, negative anomalies prevail at all stations, positive anomalies were observed at the Nalchik station in the autumn season and at the Terskol station in the winter season of 2024.

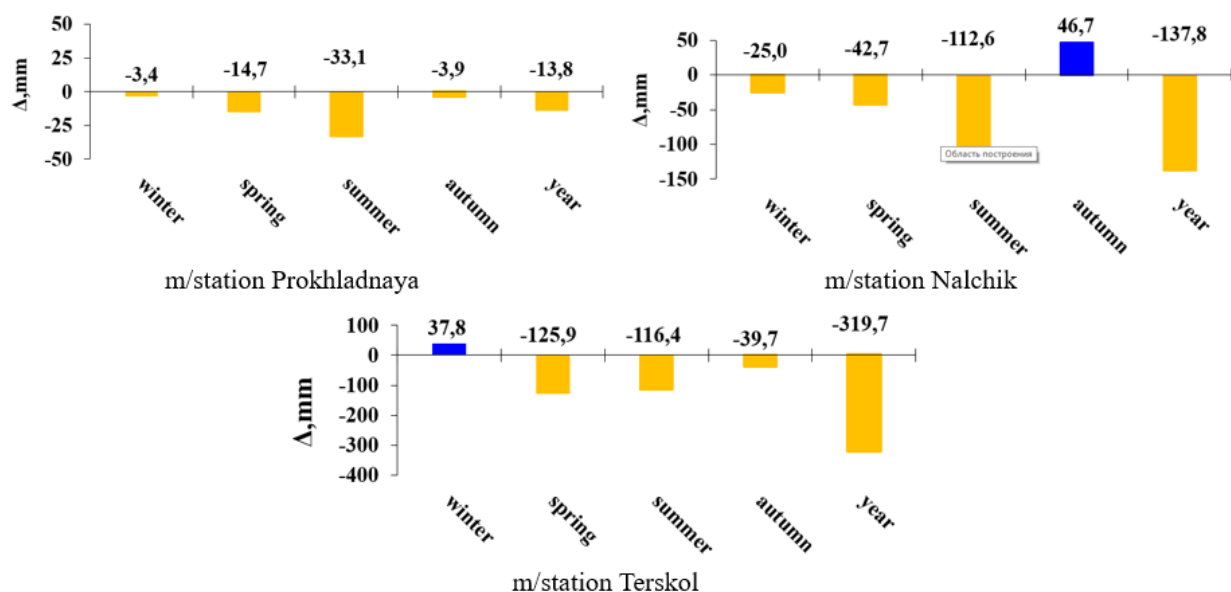


Figure 2. Anomalies of seasonal precipitation amounts for 2024 relative to the 1991-2020 climate norm

Conclusion: The study of the long-term course of average seasonal and average annual temperatures at three stations located in different climatic zones in the period 1961-2024 shows positive dynamics of average temperature growth in the steppe (Prokhladny) and foothill (Nalchik) zones in all seasons and the year as a whole. The maximum growth rate is observed in the winter and summer seasons - $0.45^{\circ}\text{C}/10$ years and $0.5^{\circ}\text{C}/10$ years, respectively, in Prokhladnaya and $0.5^{\circ}\text{C}/10$ years in Nalchik in both seasons. The linear trend at these stations is statistically significant in all seasons and the year as a whole. At the Terskol mountain station, the angular coefficient of the linear trend is statistically significant only in the summer season ($0.34^{\circ}\text{C}/10$ years) and the year as a whole ($0.12^{\circ}\text{C}/10$ years) (due to the summer season). In contrast to the consistent dynamics of air temperature, annual precipitation amounts for 1961–2024 changed unevenly. Thus, in the steppe zone, there is a slight increase in seasonal and annual precipitation amounts, with the exception of the summer season, when the trend is negative (-6.6 mm/10 years). In the foothill zone, there was a precipitation deficit in all seasons, except for autumn, where the trend was slightly positive (2.69 mm/10 years). In the mountain zone, there is a slight increase in precipitation amounts in winter, spring and autumn, and a slight decrease in summer. In contrast to the trends in average temperatures, all trends in precipitation amounts are statistically insignificant. Analysis of average temperature anomalies for the 2024 seasons showed that in all seasons, except autumn, at the considered m/stations, positive anomalies of average temperatures were observed with an excess of interannual variability from 1σ to 3σ . The exception is the Terskol mountain station, where no excess of interannual variability was observed in the winter season. Unlike the temperature in 2024, there was a negative anomaly of precipitation amounts in the winter and summer seasons in the foothill zone, in the spring season in the mountain zone with an excess of interannual variability from 1σ to 1.69σ . In the summer season, a negative anomaly from 1.69σ to 3σ was observed in the mountain zone.

References

1. The third assessment report on climate change and its consequences on the territory of the Russian Federation / Ed. by V.M. Kattsov. St. Petersburg: Science-intensive technologies, 2022.
2. Report on the features of the climate in the territory of the Russian Federation for 2024. – Moscow, 2025. – 135 p.
3. Ashabokov B. A., Teunova N.V., Kesheva L. A. Comparative assessment of the rate of change in the surface air temperature in the North Caucasus region for 1976-2012 and 1976-2019 / International Conference "Scientific research of the SCO countries: synergy and integration". 2020. Beiqing, China. Pp.156–162.
4. Ashabokov B. A., Tashilova A. A., Kesheva L. A., Teunova N. V., Taubekova Z. A. Climatic changes in mean values and extremes of surface air temperature in the south of European Russia / Fundamental and Applied Climatology. No. 1, 2017. – P. 5–19.
5. Bischokov R. M. Climatic features of the foothill, steppe and mountain zones of the Kabardino-Balkarian Republic in winter / Bulletin of the Kurgan State Agricultural Academy. No. 2, 2018. P. 18–23,
6. Kalov H. M., Litovka N. I., Naloeva R. H. Mathematical and statistical analysis of changes in the atmospheric precipitation regime in the steppe zone of the central part of the North Caucasus / Review of Applied and Industrial Mathematics. 2003. Vol. 10. No. 1. P. 169–175.
7. Khaupsheva M.Kh., Shugunov T.L., Shugunov L.Zh. Forecast and analysis of spring precipitation and anomalous deviations in the foothill zone of the KBR / Modern Science: Current Issues, Achievements and Innovations. Collection of articles from the II International Scientific and Practical Conference. 2018. P. 268–272.

Jurisprudence

EXTRADITION: BETWEEN INTERNATIONAL COOPERATION AND THE PROTECTION OF FUNDAMENTAL HUMAN RIGHTS

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Abstract

Extradition is a key legal mechanism of international cooperation in combating organized crime, terrorism, and corruption. It enables a state to request the surrender of an individual accused or convicted of a criminal offense.

However, the application of this instrument often faces limitations stemming from the protection of fundamental human rights, as guaranteed by international instruments such as the European Convention on Human Rights (ECHR).

This paper examines the legal and practical dilemmas that arise at the intersection of states' obligations to cooperate and their duty to uphold human rights. By analyzing international norms and case law, the study highlights the main challenges and opportunities to balance public security with individual rights. Key judicial decisions are reviewed to demonstrate how human rights considerations may override extradition demands when there is a real risk of torture, unfair trial, or inhuman or degrading treatment.

Keywords: extradition, human rights, ECHR, fair trial, torture, international legal cooperation.

1. Introduction

In an increasingly interconnected world where crime transcends national borders, international legal cooperation has become a necessity. Extradition, as one of the oldest forms of such cooperation, allows a state to request the surrender of an individual who is accused or convicted of a criminal offense.

However, extradition is not merely a procedural act. It raises fundamental questions about the protection of individual rights, particularly when the requesting state does not guarantee a fair justice system or when there is a risk of torture, inhuman treatment, or the imposition of the death penalty.

This paper explores the legal and ethical dilemmas arising from the application of extradition treaties in the context of international human rights obligations. It aims to examine how a balance can be achieved between ensuring justice and preserving fundamental freedoms.

2. OBJECTIVES OF THE STUDY

This research seeks to:

- 1. Present the international and national legal framework governing extradition;*
- 2. Identify the human rights-based limitations that may prevent the execution of extradition requests;*
- 3. Analyze key jurisprudence from international courts that shape current standards on extradition;*
- 4. Offer policy recommendations for a fair and balanced extradition system aligned with international legal norms.*

3. METHODOLOGY

This study adopts a multidisciplinary legal approach, combining:

- Legal-analytical method: to interpret and analyze relevant international treaties, conventions, and domestic legislation;*
- Comparative approach: to contrast the practices of different legal systems regarding extradition standards;*
- Case law analysis: focusing on landmark decisions of the European Court of Human Rights and the Court of Justice of the European Union;*
- Documentary review: examining academic literature, international reports, and human rights publications related to extradition and criminal cooperation.*

4. THE LEGAL FRAMEWORK OF EXTRADITION

- *International Legal Instruments*

Extradition is primarily governed by international treaties, including:

- The European Convention on Extradition (1957), which sets the basic legal framework among Council of Europe member states;
- Bilateral and multilateral extradition agreements defining procedural and substantive conditions for surrender;
- The UN Convention against Transnational Organized Crime (2000), which emphasizes the importance of extradition in combating cross-border criminal activity.

➤ National Law

Each state incorporates extradition rules into its domestic legal system, often aligning them with international standards..

5.ANALYSIS OF THE TENSION BETWEEN EXTRADITION AND FUNDAMENTAL RIGHTS

Several fundamental rights can restrict the execution of extradition requests:

- Right to a Fair Trial (Article 6 ECHR)

Extradition should be denied if the requesting state does not guarantee a fair and impartial trial.

- Prohibition of Torture and Inhuman or Degrading Treatment (Article 3 ECHR)

Extradition is prohibited when there is a real risk that the person will be subjected to torture or inhuman or degrading treatment in the requesting state.

- Death Penalty and Life Imprisonment without Parole

The European Court has held that extradition to states that impose the death penalty or life imprisonment without the possibility of release may violate Article 3 of the ECHR.

RELEVANT JURISPRUDENCE

- **Soering v. United Kingdom (1989)**

The UK planned to extradite a German national to the USA, where he faced the death penalty. The European Court ruled that extradition would violate Article 3 due to the "death row phenomenon."

- **Othman (Abu Qatada) v. United Kingdom (2012)**

The Court blocked extradition because of the risk that evidence obtained by torture would be used against the applicant in Jordan.

- **Trabelsi v. Belgium (2014)**

Extradition to the USA was considered a violation of Article 3 due to the risk of life imprisonment without parole.

- **Aranyosi and Caldaru v. Germany (2016)**

The Court of Justice of the EU ruled that a European arrest warrant may be suspended if prison conditions in the executing country amount to inhuman or degrading treatment. man rights concerns.

7. DISCUSSION

1. Individual Risk Assessment – Each extradition request should be evaluated on a case-by-case basis, considering the personal circumstances of the individual.

2. Diplomatic Assurances – The requesting state must provide guarantees ensuring respect for human rights.

3. Effective Judicial Review – Courts must be independent and capable of thoroughly assessing the risks involved.

4. Non-Discrimination – Extradition should not be allowed if the person risks persecution based on race, religion, nationality, or political opinions.

8.RECOMMENDATIONS

In order to ensure that extradition is both effective and consistent with international human rights law, the following measures are recommended:

- Strengthening judicial oversight

Courts must be empowered to assess not only the procedural aspects of extradition but also the human rights implications in the requesting country.

- Establishing minimum standards for diplomatic assurances

States should adopt clear criteria regarding the type and reliability of assurances that can be accepted from requesting countries.

- Refusing extradition to countries that fail to guarantee effective human rights protections

Extradition should be denied in cases where the requesting state:

- Has not ratified key international instruments (e.g., ECHR or ICCPR);
- Has a documented record of systematic human rights violations;
- Fails to provide adequate prison conditions or judicial remedies.

- *Increasing transparency and accountability*

Extradition decisions should be well-reasoned and publicly available to foster legal consistency and public trust.

- *Continuous training of legal professionals*

Judges, prosecutors, and defense attorneys should receive regular training in international law and human rights standards applicable to extradition cases.

9.CONCLUSIONS

Extradition remains an essential component of international criminal justice cooperation, particularly in the face of growing transnational crime and terrorism. However, its implementation must not come at the expense of fundamental human rights. As emphasized by the European Court of Human Rights, there are legitimate limitations to extradition—especially in cases where the individual faces a real risk of torture, an unfair trial, or inhuman and degrading punishment.

Cases such as Soering v. United Kingdom, Othman (Abu Qatada) v. UK, and Trabelsi v. Belgium have set important precedents that guide states in assessing whether an extradition request is compatible with their human rights obligations.

It is crucial for national courts and authorities to scrutinize each case carefully, balancing the interest of justice with the protection of the individual.

Bibliography

1. Council of Europe. *European Convention on Extradition*, 1957.
2. European Court of Human Rights, *European Convention on Human Rights (ECHR)*.
3. United Nations, *Model Treaty on Extradition*, 1990.
4. UN General Assembly, *International Covenant on Civil and Political Rights*, 1966.
5. *Charter of Fundamental Rights of the European Union*, 2000
6. *Soering v. The United Kingdom*, ECtHR, 1989.
7. *Othman (Abu Qatada) v. The United Kingdom*, ECtHR, 2012.
8. *Trabelsi v. Belgium*, ECtHR, 2014.
9. *M.S.S. v. Belgium and Greece*, ECtHR, 2011.
10. *Aranyosi and Căldăraru v. Germany*, ECJ, 2016
11. Ambos, Kai. *International Criminal Law and Its Enforcement*. Oxford University Press, 2019.
12. Nowak, Manfred. *Introduction to the International Human Rights Regime*. Brill, 2003.
13. Gilbert, Geoff. *Extradition, Human Rights and the Death Penalty: Reflections on Soering*. *International and Comparative Law Quarterly*, 1991.
14. Amnesty International. *Extradition and Human Rights: A Guide*, 2020.
15. Human Rights Watch. *Extradition and Fair Trial Guarantees*, various reports.
16. Sluiter, Göran & Zahar, Alexander. *International Criminal Law: A Critical Introduction*. Oxford, 2008.
17. Greer, Steven. *The Margin of Appreciation: Interpretation and Discretion under the ECHR*. Council of Europe Publishing, 2000.
18. Cassese, Antonio. *International Law*, Oxford University Press, 2005.

Pedagogical sciences

THE ROLE OF CULTURE IN ENGLISH FOR AGRICULTURE

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Abstract

Students in agricultural disciplines require English for Specific Purposes (ESP) courses that extend beyond technical language instruction. This study examines the current English syllabus at the Agricultural University of Tirana and suggests a revised framework that integrates intercultural elements into agricultural-focused topics. In Albania, agriculture has an important role in the occupation sector. Most of the students who graduate will be employed in this important agricultural sector. The course is designed to equip students with the skills needed to engage in international communication, to contribute professionally in various sectors. Therefore, English course deserves significant emphasis within agricultural universities. Given the increasing demands of a globalized world, where language and intercultural awareness are essential, this research reconsiders the design of the ESP syllabus.

Introduction

Globalization is reshaping education systems worldwide, necessitating curricular reforms that prepare students to participate in exchange programs. In this evolving world, students face many challenges, particularly regarding language and communication. This research analyzes the current ESP syllabus at the Agricultural University of Tirana and offers recommendations how to include culture in the classroom.

English, taught as a foreign language, currently relies on a syllabus and textbook designed to address agricultural topics. However, to adequately prepare students for future employment, it is essential to align language instruction with the particular needs of the labor market. English is important for communicating with clients and for carefully reading and interpreting technical manuals. As Ansarey (2016) highlights, weak English curricula in agricultural universities limit graduates' professional communication skills. The study urges the integration of ESP and communicative methods to improve employability. Similarly, Arnó-Macià, Aguilar-Pérez, and Tatzl (2019) emphasize that, in the context of growing English-medium instruction (EMI), English for Specific Purposes (ESP) courses remain essential for preparing students with the academic and professional communication skills required in internationalized higher education settings. Chan (2021) further argues that ESP should extend to work-integrated learning settings, where students can uncover and improve workplace communication skills through structured reflection and experiential tasks. As well as Mebitil (2023) found Business English learners felt unprepared for intercultural communication, agricultural students at AUT face similar challenges due to the absence of cross-cultural content in their ESP syllabus.

Method

This study relies on literature review to evaluate existing ESP courses with particular emphasis on how well they integrate intercultural communication components. The research provides a detailed analysis of the current textbook in use at AUT and suggests classroom practices to enhance students' intercultural competence.

Research Approach

The research addresses the following objectives:

- To analyze the syllabus and textbook content to identify gaps in intercultural elements.
- To evaluate learning goals related to both language and cultural awareness.
- To assess the potential of current classroom activities to include intercultural dialogue.

Key Areas of Focus:

1. Syllabus Structure Review – examining of the ESP syllabus to determine how language objectives align with intercultural learning and communication skills.

2. Content Review – A detailed analysis of the textbook used at AUT with the aim of identifying opportunities to incorporate intercultural tasks.

Why Intercultural Competence Matters in Agricultural ESP?

Students must develop an awareness of agricultural practices and values across cultures. These elements should also be included in the course content, assessment, instructional materials, and classroom strategies. Cowling (2007) emphasizes that effective syllabus design for workplace English training requires a thorough needs analysis using multiple sources and methods, with careful attention to learners' specific professional contexts and communicative goals. Similarly, Rajee Nia et al. (2013) provide a comprehensive review of syllabus design, moving from grammar-focused models to more communicative, task-based, and learner-centered approaches that align with real-world language use. Trajanovska and Starkova (2021) also present findings from the analysis of Business English syllabi at the University American College Skopje and the Ural State Pedagogical University, revealing a lack of structured and intentional focus on intercultural communicative competence. Likewise, the current ESP syllabus at the Agricultural University of Tirana also fails to incorporate cultural dimensions.

Key dimensions of intercultural competence in ESP include:

- Understanding global agricultural systems and traditions
- Respecting cultural variations in land use, environmental policies etc.

Evaluation of the Current Syllabus for Agricultural Students

A critical evaluation of the existing ESP syllabus for agriculture students at AUT reveals important areas for development. This evaluation includes a comprehensive analysis of course objectives, topic coverage, and learning outcomes. The primary goal is to find ways to improve the integration of intercultural competence within the agricultural ESP curriculum.

Course Syllabus Analysis

- Review of learning outcomes and objectives
- Assessment of cultural integration
- Identification of current intercultural elements within the textbook
- Analysis of classroom exercises for intercultural content

Designing an Intercultural ESP Syllabus for Agriculture

A redesigned syllabus should aim to integrate intercultural competence in a structured and meaningful way. This involves redesigning learning activities such as:

- Simulate real agricultural communication scenarios across cultures through role-plays or case studies.
- Encourage critical thinking and cross-country comparisons, analyzing the cultural reasons behind differences.
- Include authentic articles from different cultural contexts.
- Promoting collaboration on projects and assignments.

Moreover, the syllabus should be adaptive to students' needs, and global developments in agriculture.

Current Syllabus at AUT:

The course aims to develop vocabulary and reading skills. The course textbook, "English for Agriculture" completely lacks a cross-cultural perspective.

Proposal: Embedding Intercultural Content in Agricultural ESP Curriculum

Table 1.

Revised current ESP Topics with Intercultural Elements

Week	Topic	Intercultural Focus	Suggestions
I	Parts and Function of Plants	How different cultures use plant parts for medicine, food etc.	Group presentation "Plants in our culture"
II	Life cycle of a Plant	Explore planting/ harvesting across the world	Discussion of seasonal cycles around the world
III	Kingdom of Plants	Scientific vs folk classification system	Science vs Tradition
IV	Control of Weeds & Plant Disease	Plant health in various regions	Role-play" advising farmers in different cultures
V	Flowers	Flowers in global cultures	Visual analysis " Flowers in different countries
VI	Algae	Cultural and economic use of algae	Research project on algae use
VII	Soil formation	Beliefs and myths about soil origins	What does soil mean in your culture
VIII	Soil Physical Properties	Cultural attitudes towards soil amendments and chemical use	Articles from different countries
IX	Drainage and Irrigation	Compare traditional irrigation systems	Case studies irrigation solutions
X	Manures and Fertilizers	Global views on organic vs. inorganic fertilizers	Case study analysis: organic vs inorganic in different countries
XI	Planet Under Construction	Discuss global perspectives on climate change and agriculture	Project " Green Farming Policies Worldwide"
XII	Rocks: Formation and Classification	Geological significance across cultures	Group discussion

To effectively introduce these elements, educators are encouraged to:

- Include readings and case studies from different cultural contexts
- Encourage learners to compare Albanian practices with those of other countries
- Role-plays, group presentations to stimulate active engagement and experiential learning

Based on the proposed syllabus, educators must find methods that are applicable to agricultural programs. This syllabus will better prepare students for the realities of the job market and enhance their long-term career prospects.

Conclusion

An ESP syllabus in agriculture that includes intercultural competence does more than teach English; it prepares students to think globally. Such a curriculum equips future agricultural professionals not only with technical language proficiency but also with the cultural awareness and adaptability needed in a rapidly changing world. By understanding how agricultural practices vary across cultures, students are better prepared to participate in global markets.

References

1. Ansarey, D. (2016). A study on English teaching standard in four agricultural universities in Bangladesh. *The Agriculturists* 14 (1): 142-150 (2016)
2. Arnó-Macià, E., Aguilar-Pérez, M., & Tatzl, D. (2020). Engineering students' perceptions of the role of ESP courses in internationalized universities. *English for Specific Purposes*, 58, 58-74.
3. Chan, C.S. (2021) Helping University students discover their workplace communication needs: An eclectic and interdisciplinary approach to facilitating on-the-job learning workplace communication. *English for Specific Purposes*, 64, 55-71
4. Cowling (2007) Needs analysis: Planning a syllabus for a series of intensive workplace courses at a leading Japanese company. *English for Specific Purposes*, 26(4), 426-442
5. Mebitil, N. (2023). Exploring cultural competence in business English: bridging the gap between traditional language learning and ESP teaching. *Logos Universality Mentality Education Novelty: Social Sciences*, 12(2), 48-63. <https://doi.org/10.18662/lumenss/12.2/91>
6. Rajee Nia, M., Abbaspour, E., & Zare, J. (2013). A critical review of recent trends in second language syllabus design and curriculum development. *International Journal of Research Studies in Language Learning*, 2 (2), 63-82
7. Trajanovska I., Starkova D. Intercultural communicative competence development as one of the main objectives of business English course. *Philological Class*, vol. 26, 2021, pp. 188-199

THE IMPORTANCE OF ARTIFICIAL INTELLIGENCE IN KOREAN LANGUAGE EDUCATION**Hujanazarova Nazira Omonjanovna**

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Abstract

This article explores the application of artificial intelligence (AI) technologies—specifically chatbots and the Metaverse platform—in Korean language education. It highlights how chatbots can enhance students' spoken language skills by providing a non-judgmental environment for practice and how the Metaverse enables immersive virtual learning experiences, such as cultural exploration and real-time interaction with global users through avatars. The article also discusses the current limitations of AI, including its inability to fully comprehend non-native pronunciation and the potential risks of over-reliance on AI, such as distancing learners from real-life communication or exposure to inaccurate information. The author concludes that AI tools should be used as complementary aids, not replacements for authentic human interaction in language learning.

Keywords: Artificial Intelligence (AI), Chatbot, Metaverse, Korean Language Education, Virtual Learning, Speech Development, Language Technology

Introduction

In recent years, the integration of Artificial Intelligence (AI) into education has significantly transformed teaching and learning methods across the globe. Korean language education, in particular, has witnessed the emergence of innovative AI-powered tools such as chatbots, virtual reality (VR), and the Metaverse, all aimed at enhancing language acquisition and communication skills. The increasing digitization of learning environments has enabled educators and learners to personalize content, interact in real-time, and overcome geographical and temporal barriers.

One notable development is the use of AI chatbots that simulate conversations and help learners practice spoken Korean without the fear of judgment. Similarly, the adoption of Metaverse-based platforms allows learners to engage in immersive experiences, such as virtual cultural tours and interactive lessons. While these technologies offer numerous benefits, they also present challenges, such as recognizing non-native pronunciation and the risk of over-reliance on digital systems.

This study investigates the impact of AI applications—specifically chatbots and Metaverse platforms—on the development of oral communication skills in Korean language learners, while also evaluating their limitations and practical implications in modern language education.

The development of the 21st century has brought about profound changes in all areas, including education, by introducing a new interpretation of teaching models. The successful integration of modern information and communication technologies into educational processes to implement a digital learning environment leads to high efficiency in the following ways:

- Deep acquisition of professional knowledge by students;*
- Comprehensive understanding of academic subjects through digital modeling;*
- Expansion of independent student activity due to the diversified organization of the learning process based on a long-term plan;*
- Introduction of interactive communication tools aimed at individualizing and differentiating the learning process;*
- Utilization of artificial intelligence system capabilities by students to master strategies for acquiring learning materials;*
- Most importantly, the formation of a culture that enables individuals to access and share the latest modern information as active participants in the information society.*

Research Methodology

This research employed a qualitative-descriptive approach, combining literature review, user experience analysis, and platform observation. The data sources include:

Existing academic studies and white papers on AI in language education

Case analysis of platforms such as Sejong Institute's AI Chatbot and Visang Education's chatbot system

Observation of the Metaverse-based Korean language learning environments during and after the COVID-19 pandemic

User feedback and survey results from learners who engaged with chatbot and Metaverse platforms for Korean learning

The study focuses on evaluating:

The effectiveness of AI tools in improving oral communication

User interaction patterns and engagement levels

Challenges and limitations faced by learners and educators

Cultural and linguistic adaptability of AI technologies in a multi-national learning context

Research on the use of multimedia tools in teaching the Korean language began in Korea in the late 1990s. Most of these studies focused on developing web-based Korean language learning programs. Since the internet was in its early stages in the 1990s, much attention was given to digitizing resources. Studies related to language learning in a digital environment began primarily after the 2000s.

In December 2019, South Korea's Ministry of Science and ICT announced the **"National Strategy for Artificial Intelligence (AI)"**, which aimed to establish an AI-based education system covering the entire population and to promote the implementation and political strengthening of AI usage across all sectors.

As artificial intelligence has evolved to the level of human cognitive functions, it is now regarded as a key driver of paradigm shifts across industries and society. In the education sector, a new paradigm called **"AI-integrated education"** is emerging, where AI is taught in conjunction with every subject (Shin Wonsun, Shin Donghun, 2020).

It can be said that the emergence of artificial intelligence has marked the beginning of the **fifth industrial revolution**, as it has integrated mass technological advancements into daily human life. AI—especially through technologies like **speech recognition and neural machine translation**—is expected to significantly reduce communication difficulties in foreign languages. Moreover, it is anticipated to influence the role and importance of foreign language subjects in general education programs (Kim Hyunsoon, Kim Hyeyoung, 2017).

In education, particularly in foreign language learning, applications like **ChatGPT, chatbots, and virtual reality (VR)** are considered breakthrough innovations of the 21st century.

At the end of 2022, the U.S.-based AI research center **OpenAI** launched ChatGPT, a program capable of interacting with users. The name ChatGPT stands for "Chat + Generative Pre-trained Transformer," and it is built on a transformer algorithm originally developed by Google. It is described as a **"generative model pre-trained and fine-tuned for conversation."** This tool currently leads in areas such as **text or word translation and information retrieval**.

Chatbots and Metaverse in Korean Language Education: Possibilities and Limitations

Chatbots also play a significant role in language learning by organizing conversations that help improve learners' speaking skills. The very first chatbot used in foreign language education was **ELIZA**, developed in 1966 by Joseph Weizenbaum at the MIT Artificial Intelligence Laboratory for psychotherapy purposes. In modern AI applications, learners' performance is analyzed, and **personalized tasks** are provided accordingly.

Currently, it is possible to engage in conversations on various topics in Korean using AI chatbots developed by the **Sejong Institute** and the **Visang Learning Center**. These AI chatbots can recognize the Korean pronunciation of learners from different nationalities and respond appropriately based on their level of knowledge, thereby helping to develop their **spoken language proficiency**.

One key advantage of chatbots, as identified in surveys, is their **non-judgmental nature**. While learners may avoid real-life conversations due to anxiety over their mistakes, they feel more comfortable speaking with chatbots without the fear of embarrassment, allowing for more open and frequent practice.

During the COVID-19 pandemic, when foreign nationals were restricted from entering Korea, a **Metaverse platform** was developed to offer a virtual alternative to visiting the country. A unique feature of this platform is that users can create avatars to interact with peers in the virtual world, explore Korean culture, take virtual tours of historical and tourist sites, place orders at restaurants, and simulate shopping experiences—all through their avatars.

A major advantage of this platform is that learners can **design their own avatars** to represent themselves in the virtual space, allowing them to access distant places that would otherwise be

inaccessible. The term "**Metaverse**", derived from "meta" (beyond) and "universe," refers to a **hybrid space where virtual and real life converge**.

The **Sejong platform** also uses Metaverse technology, enabling Korean language learners to join classes with peers from different countries based on their proficiency level and to develop oral communication skills through live avatars. The term "Metaverse" was first introduced in 1992 in Neal Stephenson's science fiction novel *Snow Crash*, describing a blended digital-physical universe. The platform enables **real-time interaction** with users worldwide, eliminating time and space constraints.

A good example of this is the **National Hangul Museum**, opened in October 2014, which can now be toured virtually via Metaverse. From home, learners can explore the museum's interior, hold voice conversations with other visitors, and read or listen to the information on display. Not only can they see the exhibits through their avatars, but they can also **hear explanations** about each artifact, enriching the learning experience.

Although Korea has made significant progress in digitalizing education and integrating AI, there are still **notable limitations**—especially in the case of chatbots. First, AI is still unable to fully comprehend the sentences of non-native Korean speakers, primarily due to pronunciation errors, which need to be systematically recorded and addressed—a task that remains unfinished. Second, there is a **risk of learners becoming overly reliant on AI**, potentially isolating them from real-life communication and making them vulnerable to **inaccurate or misleading information**.

Analysis

The findings reveal that AI-powered chatbots provide an effective platform for learners to practice conversational Korean in a stress-free and personalized environment. Unlike traditional classroom settings, learners using chatbots reported reduced anxiety and increased frequency of practice. Early examples of chatbots like ELIZA, originally created for psychotherapy, laid the groundwork for today's intelligent tutoring systems.

The Sejong and Visang AI chatbots were found to recognize Korean speech input from learners of different nationalities and respond appropriately based on the user's proficiency level. These tools also offer pronunciation feedback and thematic dialogues, contributing to gradual oral fluency.

In the case of Metaverse platforms, users could design avatars, attend virtual classes, visit cultural sites, and practice conversations in simulated environments such as restaurants and shopping centers. This immersive experience proved particularly effective during the pandemic when physical mobility was limited. It also helped learners connect emotionally with the language and culture of Korea, which is often lacking in traditional e-learning environments.

However, limitations were identified:

AI chatbots often struggle to recognize and interpret pronunciation errors from non-native speakers.

Learners may become overly dependent on AI, reducing opportunities for real-world communication.

There remains a gap in personalized correction feedback, especially for complex sentence structures and idiomatic expressions.

Results

The study concludes that AI tools such as chatbots and Metaverse environments significantly enhance Korean language learning, particularly in developing oral communication and cultural competence. Key outcomes include:

Increased learner engagement and confidence in speaking Korean

Improved accessibility to authentic language practice through virtual means

Positive learner perception of AI as a supportive, non-judgmental communication partner

Expansion of learning environments beyond traditional classroom constraints

Nonetheless, AI is not yet capable of fully replacing human educators or authentic conversation. The current limitations—especially in pronunciation recognition and contextual language feedback—highlight the need for continuous improvement and hybrid learning models where AI tools support, rather than replace, teacher-led instruction.

Conclusion.

In summary, while AI tools such as chatbots and Metaverse platforms greatly enhance the Korean language learning experience by providing interactive, accessible, and engaging environments, they are not without limitations. These technologies should be viewed as **supplements** to, rather than **replacements** for, authentic human interaction and well-rounded educational practices.

References

1. 이해영 (2000). 인터넷의 활용과 한국어 개별화 수업 설계. *Multimedia Assisted Language Learning*, 3(1), 264-286.
2. Buckingham, D.(2003), *Media Education: Literacy, Learning, and Contemporary Culture*, 기선정, 김아미 2004 번역본, “미디어 교육 학습 리터러시, 그리고 현대문화”. jNBOOK 2004
3. Bloom, K. & Johnson, K. M.,(2010), *Digging into YouTube Videos: Using Media Literacy and Participatory Culture to Promote Cross-Cultural Understanding*, *The National Association for Media Literacy Education's Journal of Media Literacy Education* 2:2, 113-123.
4. 조영미. (2020). 미디어 리터러시 향상을 위한 한국문화 교육 방안 연구 - <한국유행문화개론>의 프로젝트 기반 학습을 중심으로 -. *외국어로서의 한국어교육*, 59, 423-452.
5. 신원섭.신동훈(2020), *초등학교교육에서 인공지능의 적용방안 연구*, *초등과학교육* 39, 하늬초등과학교육학회. 117-132쪽.
6. Xo'janazarova Nazira. *Chet tillarni o'qitish uchun su'niy intellekt(chatbot)ning xususiyati*. *New Innovation in National Education for Actively Participating in the Journal. Inter Education & Global Study*, 2023
7. Xo'janazarova Nazira. *Media savodxonlik hamda raqamlashtirish muhitida koreys tilini o'qitish*. *Научно-теоретический и методический журнал / Scientific Theoretical and Methodical Journal*, ISSN 2992-9024 (online), 2024, №10(1)
8. Xo'janazarova Nazira. *Koreys tilini o'rganishda raqamli texnologiyalarning roli. "oliy ta'limda tillarni o'qitishning zamonaviy tendensiyalari: yangicha yondashuv va tadqiqotlar"* (227-232) 2025/2/28.
internet manba
9. <https://stdict.korean.go.kr>
10. <https://ko.dict.naver.com>
11. <https://www.visang.com>

DEVELOPING ECONOMIC TRANSLATION SKILLS IN A DIGITAL EDUCATIONAL SETTING**Khujanazarova Nozima Omonjonovna**

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Abstract

This article explores the role of digital learning environments in translating economic texts. The article examines effective methods of teaching economic translation based on competency-based, constructivist, and connectivist approaches. The types, linguistic features, and translation strategies of economic texts were analyzed. The analysis showed that digital resources can effectively develop translation competencies in students. In conclusion, it is emphasized that an integrated approach serves to qualitatively organize economic translation education in a digital environment.

Keywords: *economic translation, digital learning environment, translation competence, terminological accuracy, translation methodology, connectivism theory, constructivist approach, corpus-based learning, translation strategies, economic texts.*

Translation of economic texts is an activity that requires specific linguistic and extralinguistic knowledge. Economic texts are distinguished by their rich terminology, strict methodological approach, and clear content. As noted in a study posted on the ResearchGate platform, "the study of economics, along with economic organizations, institutions, and movements, does not escape the attention of linguists and translators"¹. "The potential of the digital learning environment in teaching the translation of economic texts is enormous. By using modern information and communication technologies, it is possible to effectively form professional translation competencies in students by working with authentic materials, modeling real translation situations, and applying modern translation technologies in practice. When teaching the translation of economic texts, it is important to consider the following aspects:

Terminological accuracy - choosing precise equivalents of economic terms;

Contextual approach - the correct interpretation of the content of economic concepts within the context;

Style standards - maintaining the stylistic features of economic documents;

Extralinguistic knowledge - the application of knowledge about economic theory and practice².

These five aspects are interrelated and complementary components. Their comprehensive development forms the basis of the process of teaching economic translation in a digital learning environment. As a result, students acquire not only linguistic knowledge, but also all the professional competencies necessary for a modern translator.

The concept of "digital learning environment" is a widely used concept in modern pedagogical literature, it is a learning environment created on the basis of information and communication technologies, providing constant access to information and educational resources for all participants in the educational process. As ME Vajeyevskaya and YI Kapitonova noted, "a digital learning environment is a technological platform that provides online communication between all participants in the educational process, creates opportunities for storing, transferring and using educational materials."³ The development of a methodology for teaching students to translate economic texts in the context of a digital learning environment is of urgent importance today. As discussed above, the digital learning environment provides new opportunities and approaches to the educational process, including the effective use of modern technologies in the process of translation teaching, the use of educational materials creates ample opportunities for individualization and organization of independent work of students. However, in order to increase the effectiveness of teaching the translation of economic texts in a digital educational environment, it is necessary, first of all, to have a deep understanding of the specific features of economic texts and the laws of their translation. Below, the concept of economic texts and their translation features will be considered in detail.

¹ Biznes va tijorat terminlari va ularning o'ziga xos xususiyatlari.

https://www.researchgate.net/publication/351642660_Biznes_va_tijorat_terminlari_va_ularning_o'ziga_xos_xususiyatlari

² Bojxona tizimida me'yoriy hujjatlarni yuritish / O'quv qo'llanma.

https://www.researchgate.net/publication/367509577_BOJXONA_TIZIMIDA_ME'YORIY_HUJJATLARNI_YURITISH_O'quv_qo'llanma

³ Vajeyevskaya, M.E. & Kapitonova, Y.I. (2018). Raqamli ta'lim muhitining o'ziga xos xususiyatlari. Ta'lim texnologiyalari, pp.4, 56-67.

Economic texts include a variety of texts related to the field of economics. These texts are divided into several groups, each of which has its own linguistic, stylistic, and terminological characteristics.

Scientific and academic texts (scientific articles, monographs, dissertations) have a high level of terminological density, complex syntactic structures and a strict logical structure. When translating them, it is important to ensure terminological accuracy, maintain the scientific style and correctly convey complex syntactic structures using transformations. When translating scientific and academic economic texts, it is important to preserve the scientific and academic discourse characteristics of the text along with terminological accuracy. It should be emphasized that in this process, not only linguistic, but also economic knowledge of the translator is of great importance.

Educational and methodological texts (textbooks, manuals) are characterized by a moderate level of terminological density, a wealth of explanations and a didactic orientation. When translating them, it is necessary to translate terms with explanations, ensure the clarity and consistency of the material, and adapt the examples to the culture of the target language. The main task in the translation of educational and methodological economic texts is to preserve the functions of knowledge transfer, explanation and teaching. When translating texts of this type, it is important to present complex economic concepts in an understandable form, maintain a pedagogical orientation and ensure the didactic function of the text.

Official-legal texts (contracts, reports, laws) are characterized by a standardized structure, the joint use of legal and economic terminology, and an official-departmental style. When translating them, it is necessary to use exact equivalents of legal and economic terms, maintain a standardized structure, and take into account the legal implications of the text. Terminological accuracy and structural stability are of particular importance in the translation of official-legal economic texts. Even the slightest error in the translation of this type of text can have serious legal consequences, therefore, the translator must have a thorough knowledge of legal and economic terminology, take into account the differences in the legal systems of the two countries, and preserve the legal force of the text.

Financial and banking texts (financial reports, bank documents) are characterized by a high level of financial and banking terminology density, an abundance of digital information and a standardized structure. When translating them, it is necessary to select precise equivalents of financial and banking terms, correctly convey digital information and take into account international standards. The main criteria for translating financial and banking texts are the accuracy of digital information and terminological consistency. When translating financial reports, bank documents and other financial texts, knowledge of international financial standards, perfect mastery of financial and banking terminology and accurate transmission of conceptual concepts in the field of finance are of great importance.

Business texts (business plans, marketing research) are characterized by the use of business terminology, a clear and concise manner of expression, and a pragmatic orientation. When translating them, it is important to preserve the pragmatic function of the text, take into account cultural aspects, and maintain a business style. When translating business texts, it is important to preserve the communicative purpose and pragmatic function of the text. Business texts are distinguished by their pragmatic orientation, that is, they are aimed at achieving specific practical results. Therefore, when translating such texts, it is necessary to take into account the cultural context, business traditions, and the characteristics of business relations.

Popular economic texts (economic news, magazines, interviews) are characterized by a low level of terminological density, the presence of popular style and emotional-expressive means. When translating them, it is necessary to translate economic terms into popular language, select functional equivalents of metaphors and figurative expressions. In the translation of popular economic texts, along with preserving the figurative and emotional aspects of the text, an important task is to ensure comprehensibility for readers of the target language. Texts of this type are often written to explain complex economic phenomena in popular language, therefore, in the translation process, it is necessary to preserve this function of the text, express economic terms in popular language, and take into account the cultural context.

When translating all types of economic texts, it is necessary to solve terminological, linguistic, extralinguistic and pragmatic problems. In the process of translating economic texts, it is necessary to take into account the specifics of the field of economics, the differences between the conceptual systems of languages, and the cultural context. Economic translation is a complex process that requires not only linguistic knowledge, but also deep knowledge of the field of economics, in which the translator translates not only words and terms, but also economic concepts and notions.

It is advisable to use terminological, syntactic and pragmatic strategies in the process of translating economic texts. When translating economic texts, it is important to correctly select translation strategies depending on the type, genre, communicative purpose and characteristics of the target audience of the text. In order to ensure terminological consistency, semantic accuracy, stylistic compatibility and pragmatic equivalence in the translation process, the translator must flexibly use various strategies and choose an individual approach for each text.

In the process of translating economic texts, it is necessary to take into account their type and specific features, ensure terminological accuracy, maintain the communicative purpose of the text, and take into account the characteristics of the target audience. This requires the translator not only linguistic knowledge, but also in-depth knowledge of the field of economics. In the process of teaching students to translate economic texts in a digital learning environment, it is important to teach the various features of the texts and translation strategies discussed above.

Economic texts have their own linguistic and stylistic characteristics, the main features of which include: terminological density, standardized syntactic structures, stylistic neutrality, clarity and conciseness, and logical consistency. These characteristics distinguish economic texts from texts in other fields and allow for the application of special approaches to their translation.

Terminological density is the most important characteristic of economic texts. Economic texts widely use terms from general economic, narrow sectoral and bordering sectors. According to research, in such texts, terms can make up 20-30% of the total lexicon. Terminological density increases the volume of information in economic texts and serves to convey information in a clear, concise manner ⁴. The terminological density of economic texts, while ensuring information saturation, creates serious difficulties in the translation process. The history of the formation and development trends of economic terminological systems in Uzbek and English are different, as well as the conceptual space of economic concepts. Therefore, the translator, while ensuring the equivalence of terms, must also take into account the differences between economic concepts.

Standardized syntactic structures are another important feature of economic texts. Nominalization (noun forms instead of verbs), passive constructions, complex conjunctions, conditional constructions, infinitive and adjective turnovers are widely used in these texts. Such syntactic structures allow for systematic transmission of information and ensure accuracy ⁵. Passive constructions and complex noun compounds are widely used in economic texts in English. However, it is not always advisable to preserve these structures when translating into Uzbek, since the syntactic structure and stylistic norms of the Uzbek language differ from English. While maintaining the clarity of thought, the translator can use syntactic structures specific to the Uzbek language, for example, expressing passive constructions in the active form, simplifying long noun compounds and using subordinate clauses.

Style neutrality is one of the characteristic features of economic texts. Emotional-expressive means are almost never used in these texts, evaluative vocabulary is rare, and the author's point of view is not openly expressed. Economic discourse strives for stylistic neutrality, since economic information must be objectively and accurately conveyed ⁶. Maintaining the stylistic neutrality of economic texts is an important principle in the translation process. However, depending on the genre characteristics of economic texts, this principle manifests itself differently. For example, while a high level of stylistic neutrality must be maintained in scientific and academic texts, emotional-expressive means can be used to a certain extent in popular economic texts, such as business magazines and articles covering economic news. The translator must take into account the genre of the text and the requirements of the target audience.

Clarity and brevity are important features of economic texts, manifested in the absence of redundant words, repetitions and ambiguous expressions. Each idea is expressed clearly and concisely, quantitative data (percentages, indicators, statistical data) are often used. This feature increases the informativeness of economic texts ⁷. Clarity and brevity in economic texts arise from their communicative purpose - to convey information correctly and concisely. Maintaining this feature during the translation process is a difficult task, since the volume of the text may change due to differences in the lexical and grammatical systems of languages. The translator, along with accurately expressing the informative components of the text, must also take into account the stylistic norms of the target language. Clarity is required in the translation of quantitative data, statistical data, and elements such as units of

⁴ Hoffmann, L. (2017). *Fachsprachen und Gemeinsprache. Übersetzungswissenschaft – Eine Neuorientierung*. Tübingen: Francke, S. 64.

⁵ Реформатский, А.А. (2016). Термин как член лексической системы языка. Проблемы структурной лингвистики. Москва: Наука.

⁶ Stein, G. (2018). *The English Business Text: Its Linguistic Features. Studies in LSP*. Copenhagen: Erhvervsøkonomisk Forlag, p. 97.

⁷ Комиссаров, В.Н. (2019). Теория перевода (лингвистические аспекты). Москва: Алетейя., с. 181.

measurement, currency symbols must be presented in a form understandable to the target language audience.

Logical coherence is a structural feature of economic texts, in which thoughts are developed in a consistent sequence. Each thought follows from the previous one, arguments and examples are placed in a logical order. The structure of the text is distinguished by its clarity and comprehensibility⁸. Logical coherence in economic texts ensures the level of coherence of the text. In the translation process, it is important to preserve the logical structure of the text and correctly convey logical-semantic connections between thoughts. For this purpose, the translator, along with preserving the macrostructure of the text, must also take into account its microstructure, and correctly express the logical connections between paragraphs and sentences. The Uzbek and English languages have their own characteristics of connectives, which the translator must take into account in the translation process.

As P. Newmark noted, when translating economic texts, it is important to maintain the semantic accuracy of the original text and correctly select equivalents in the target language⁹. In the process of translating economic texts, it is necessary to pay attention to the following aspects: ensuring terminological accuracy and consistency, applying grammatical-syntactic transformations, preserving the structure of the text, implementing pragmatic adaptation, correctly conveying economic realities and accurately translating quantitative information. The idea put forward by P. Newmark expresses an important principle of translating economic texts - semantic accuracy and equivalence. However, it is not always possible to achieve complete equivalence in translation practice. This is due to the differences in the system of economic concepts in English and Uzbek, as well as differences between economic systems. It is advisable for the translator to understand the concept of "equivalence" in a broad sense and pay attention to the communicative purpose and function of the text.

Terminological accuracy and consistency - involves the selection of correct equivalents of economic terms, the consistent use of terms, and the maintenance of the terminological system during the translation process¹⁰. Ensuring terminological accuracy and consistency is one of the most important requirements for the translation of economic texts. In this process, the translator has two main tasks: 1) selecting precise equivalents of terms that are appropriate for the context; 2) using terms consistently throughout the text. The synonymy of economic terms in English is extensive, and the translator must take into account terminological variations when translating them into Uzbek. Also, in Uzbek economic terminology, there are cases of instability of the terminological system, which creates difficulties for the translator. It is advisable for the translator to use popular dictionaries and reference books, as well as to consult with industry experts.

Grammatical-syntactic transformations are necessary for recreating economic texts with complex syntactic structures in the target language¹¹. The use of grammatical-syntactic transformations in the translation process is a necessary process due to the differences in the systems of the English and Uzbek languages. Analytical structures in English are replaced by synthetic forms in the Uzbek language, and various transformations (transposition, substitution, addition, subtraction, compensation) are used in the translation of word order, subordinate constructions, modal, temporal constructions. When using transformations, the translator must preserve the content of the original text, while also taking into account the norms of the target language.

Maintaining the structure of the text is important for ensuring logical consistency and maintaining the communicative function of the text¹². The structural features of economic texts differ depending on their genre. For example, a strict logical structure is observed in scientific and academic texts, a standardized structure in official and legal texts, and a pragmatically oriented structure in business texts. The translator should try to preserve the structural features of the text, taking into account the genre of the text. In this process, it is important to preserve elements such as text sections, paragraphs, the location of informative blocks, headings, columns. However, in some cases, the structure of the text has to be adapted to the requirements of the target language culture and genre.

Pragmatic adaptation – when translating economic texts, it is necessary to take into account the target language culture, recipient characteristics and pragmatic factors¹³. Pragmatic adaptation – the process of transforming the text into a convenient, understandable form for the target language

⁸ Гальперин, И.П. (2017). Текст как объект лингвистического исследования. Москва: УРСС, с. 74.

⁹ Newmark, P. (2001). A Textbook of Translation. Shanghai: Shanghai Foreign Language Education Press, p. 151.

¹⁰ Влахов, С., Флорин, С. (2019). Непереводимое в переводе. Москва: Международные отношения, с. 223.

¹¹ Бархударов, Л.С. (2018). Язык и перевод: Вопросы общей и частной теории перевода. Москва: ЛКИ, с. 190.

¹² Nord, C. (2018). Translating as a Purposeful Activity: Functionalist Approaches Explained. London: Routledge, p. 41.

¹³ Neubert, A. (2020). Text and Translation. Leipzig: Verlag Enzyklopädie, p. 85.

audience, while preserving its communicative purpose. In this process, the translator must take into account the following factors: the characteristics of the target audience (level of knowledge, professional training, needs), cultural context (differences between economic concepts, institutions, systems), communicative situation (where and for what purpose the text is used). Pragmatic adaptation uses methods such as providing additional explanations, selecting alternatives for non-equivalent terminology, and adapting culturally specific elements.

Correctly conveying economic realities requires taking into account the differences between the economic systems, institutions and realities of different countries ¹⁴. Economic realities are concepts, institutions, structures, indicators that are characteristic of the economic system of a particular country. In the process of translating them, it is necessary to ensure intelligibility for the target language audience, while correctly conveying the content. Various strategies are used in this process: 1) selection of a functional analogue; 2) transliteration (with annotation); 3) descriptive translation; 4) adaptation. When choosing a strategy, the translator must take into account the genre of the text, the preparedness of the audience and the importance of economic reality for the text.

Accurate transmission of quantitative data – involves the correct translation of important informative elements in economic texts, such as statistical data, numbers, percentages and currency units ¹⁵. Accurate transmission of quantitative data is of particular importance in the translation of economic texts, since even the smallest error in numbers can lead to serious changes in meaning. The translator must not only correctly transfer numbers, but also correctly express the names of units of measurement, currency units, indicators. It is also necessary to take into account the differences in the ways of expressing numbers between English and Uzbek (for example, the use of commas and periods in numbers in English, methods of writing large numbers in parts).

Teaching the translation of economic texts in a digital learning environment is based on a number of theoretical foundations. The most important of them are the following:

Connectivism theory – The connectivism theory, put forward by G. Siemens and S. Downes, is one of the main theoretical and methodological foundations of teaching in a digital educational environment. As M. K. Lutfullayev noted, “according to the theory of connectivism, knowledge is located in network nodes, and the main task of the teacher is to teach students to establish connections between these nodes ¹⁶.” The main value of the theory of connectivism in translation teaching is that, taking into account the dispersed and networked nature of knowledge, it allows us to view the translation process not as a strictly defined algorithm, but as a process of establishing connections between knowledge and resources. By applying the theory of connectivism in translation education, students develop the skills of searching, analyzing, sorting and synthesizing information sources. This helps to form the instrumental competence necessary for an economic translator in a modern digital environment.

Constructive approach – students are viewed as active constructors of knowledge. As D. Kiraly noted, “the use of a social constructive approach in the process of teaching translation allows for the effective development of translation competence by ensuring the active participation of students and creating conditions for their joint construction of knowledge ¹⁷.” The value of this approach in the process of teaching the translation of economic texts in a digital learning environment is that it interprets the translation process as a process based on creative collaboration, critical thinking and discussion of real situations, in addition to the use of mechanical rules and algorithms. The translation of economic texts is not just an operation of replacing terms, sentence patterns and structural units, but a complex cognitive-social process.

The competency-based approach is a modern paradigm of translation training. The use of a competency-based approach in teaching the translation of economic texts is of particular importance, since an economic translator must have not only linguistic knowledge, but also economic knowledge, skills in working with translation technologies, knowledge of economic realities and differences between the system of economic concepts in different cultures. In the formation of these competencies, it is necessary to organize training in conditions close to real translation situations, combining theory and practice.

Issues of applying corpus-based teaching methods to the process of teaching translation In our opinion, the most important advantage of the corpus-based teaching method is the opportunity to study economic terms, phrases and other language units not in isolation, but in the context of a real authentic

¹⁴ Hatim, B. (2020). *Teaching and Researching Translation*. London: Routledge, p. 112.

¹⁵ Newmark, P. (2001). *A Textbook of Translation*. Shanghai: Shanghai Foreign Language Education Press, p. 168.

¹⁶ Lutfullayev M.X. (2020). *Oliy ta'limda masofaviy o'qitish modelini ishlab chiqish va joriy etish*. Toshkent, p.36

¹⁷ Kiraly D. (2015). *A Social Constructive Approach to Translator Education*. London: Routledge. , pp. 56-58

text. Creating a parallel corpus of economic texts in a digital learning environment and using it in the learning process allows not only to study terminological equivalence, but also to practically analyze translation transformations, stylistic features and translation strategies. Corpus tools form students as independent researchers and teach them to practically study terminological consistency, translation options and methodological norms.

Conclusion

In conclusion, it should be noted that teaching the translation of economic texts in a digital educational environment requires a comprehensive approach, in which it is important to integrate the theoretical foundations and approaches considered above, use modern pedagogical and digital technologies, and take into account the individual characteristics of students. This, in turn, provides an opportunity to effectively develop students' translation competence and train them as personnel meeting the requirements of the modern labor market. Teaching the translation of economic texts in a digital educational environment is an integral part of modern translation education and requires a comprehensive approach. In this process, attention should be paid to the formation of linguistic, extra-linguistic and technological competencies in students. The combination of theoretical approaches, practical methods and digital resources serves to organize economic translation education more effectively.

References

BOOKS:

1. Hoffmann, L. (2017). *Fachsprachen und Gemeinsprache. Übersetzungswissenschaft – Eine Neuorientierung*. Tübingen: Francke, p.125
2. Реформатский, А.А. (2016). Термин как член лексической системы языка. Проблемы структурной лингвистики. Москва: Наука.
3. Stein, G. (2018). *The English Business Text: Its Linguistic Features*. Copenhagen: Erhvervsøkonomisk Forlag.
4. Комиссаров, В.Н. (2019). Теория перевода (лингвистические аспекты). Москва: Алетейя.
5. Галперин, И.Р. (2017). Текст как объект лингвистического исследования. Москва: URSS.
6. Newmark, P. (2001). *A Textbook of Translation*. Shanghai: Shanghai Foreign Language Education Press.
7. Влахов, С., Флорин, С. (2019). Непереводимое в переводе. Москва: Международные отношения.
8. Hatim, B. (2020). *Teaching and Researching Translation*. London: Routledge.
9. Бархударов, Л.С. (2018). Язык и перевод: Вопросы общей и частной теории перевода. Москва: ЛКИ.
10. Nord, C. (2018). *Translating as a Purposeful Activity: Functionalist Approaches Explained*. London: Routledge.
11. Neubert, A. (2020). *Text and Translation*. Leipzig: Verlag Enzyklopädie.
12. Kiraly, D. (2015). *A Social Constructivist Approach to Translator Education*. London: Routledge.
13. Lutfullayev, M.X. (2020). *Oliy ta'limda masofaviy o'qitish modelini ishlab chiqish va joriy etish*. Toshkent.

Articles :

14. Vajeyevskaya, M.E., Kapitonova, Y.I. (2018). Raqamli ta'lim muhitining o'ziga xos xususiyatlari. Ta'lim texnologiyalari, №4, 56–67.

INTERNET XIZMATIDAN (ONLINE RESURLAR):

15. Biznes va tijorat terminlari va ularning o'ziga xos xususiyatlari. [Online resurs] <https://www.researchgate.net/publication/351642660>
16. Bojxona tizimida me'yoriy hujjatlarni yuritish. O'quv qo'llanma. [Online resurs] <https://www.researchgate.net/publication/367509577>
17. Khujanazarova, N.O.(2025). Features of translating economic texts from English into Uzbek. Namangan davlat universiteti ilmiy axborotnomasi , №2,p-p. 505-509

THE RISING OF LEVEL EFFICACY OF PREVENTIVE WORK TO WARNING OF PEDAGOGICAL CONFLICTS IN EDUCATIONAL INSTITUTIONS

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ПОВЫШЕНИЕ УРОВНЯ ЭФФЕКТИВНОСТИ ПРОФИЛАКТИЧЕСКОЙ РАБОТЫ ПО ПРЕДУПРЕЖДЕНИЮ ПЕДАГОГИЧЕСКИХ КОНФЛИКТОВ В ОБРАЗОВАТЕЛЬНЫХ УЧРЕЖДЕНИЯХ

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Abstract

The given article is dedicated to one of the actual problems of pedagogues - to organization of effective preventive work to warning of pedagogical conflicts in educational institutions (secondary school). In the article are shown and analyzed aspects of pedagogical conflicts, the ways of their positive solution. In the article are shown a role of pedagogical collective it level of professional training in field of solution of pedagogical conflicts in teaching and educational process of secondary school. In the article is emphasized a role of joint work of parents of pupils and pedagogical collective of secondary school in preventive work to warning of pedagogical conflicts. An article gives necessary recommendations to improvement of preventive work to warning of pedagogical conflicts in the secondary school.

Аннотация

Статья посвящена вопросам организации эффективной профилактической работы по предупреждению педагогических конфликтов в общеобразовательной средней школе. В работе рассматриваются и анализируются основные виды педагогических конфликтов, характерных для школьной среды. Особое внимание уделяется взаимосвязи между уровнем профессиональной подготовки педагогического коллектива и результативностью профилактических мероприятий. Отмечается, что успешная профилактика педагогических конфликтов требует скоординированных усилий не только учителей и администрации школы, но и родителей учащихся. В статье подчеркивается важность налаживания конструктивного взаимодействия между всеми участниками образовательного процесса. Также предлагаются условные рекомендации, направленные на повышение эффективности профилактической работы

Keywords: pedagogical conflict, pupils-teenagers, secondary school, social- pedagogical collective, preventive work, social institutions of society

Ключевые слова: педагогический конфликт, учащиеся-подростки, средняя школа, педагогический коллектив, профилактическая работа, социальные институты общества

Проблема, которую мы будем обсуждать на страницах нашей статьи, очень важная и актуальная с точки зрения организации наиболее эффективного и действенного учебно-воспитательного процесса в образовательных учреждениях. Это проблема присутствует на протяжении всего времени обучения и воспитания учащихся, однако достигает своих своеобразных пиковых показателей именно в подростковом возрасте. Именно в подростковом возрасте педагогическому коллективу образовательного учреждения (средняя общеобразовательная школа) приходится наблюдать резкое увеличение числа педагогических конфликтов (а именно о них будет идти речь) в ученической среде. Это конфликты не обязательно носят только лишь межличностный характер («ученик-ученик»), но захватывают довольно большой ареал в виде конфликтов с учителями и администрацией образовательного учреждения.

Специалисты, работающие в системе образования, подчёркивают, что чисто теоретически конфликты между учениками и администрацией могут иметь место, однако, основываясь на широком материале педагогических наблюдений и опыта профессиональной работы, можно подчеркнуть, что, по большому счёту педагогические конфликты между учениками и администрацией хотя и имеют место, но их количество очень незначительное и поэтому на страницах психолого-педагогической литературы такие конфликты не занимают особо большого места. «Ярко выраженные педагогические конфликты бывают, в основном, в ученической среде» (3, 18). И погашение этих конфликтов, регуляция взаимоотношений среди учащихся-подростков остается, в основном, главной прерогативой профессиональной деятельности учительского коллектива средней школы.

По наблюдениям учёных-исследователей и практических работников высокого профессионального уровня, педагогический конфликт среди ученического коллектива носят, в основном, межличностный характер. Большая часть конфликтов происходит именно среди учащихся-подростков, и это, собственно, ожидаемый и аргументированный параметр, который, если даже не всё, то в достаточно широкой степени объясняет возникновение такого феномена. Речь идет о том, что подростковый возраст, по оценкам педагогов, психологов, социологов, является очень сложным возрастным периодом в жизни молодых людей. То, что кажется совершенно не интересным, не стоящим серьёзного внимания, в подростковом возрасте принимает гротесковые формы и требует, по их разумению, сиюминутного разрешения. Причём, что самое интересное, даже в каком-либо конфликте если подросток видит, что он неправ, всё равно его бушующая натура требует того, чтобы конфликт был разрешён исключительно в его пользу. Это создает колоссальные трудности для педагогического коллектива, где учителя не всегда могут найти разумное решение (особенно это относится к молодым учителям) удовлетворяющее обе стороны конфликта.

Поэтому, очень важным нам представляется организация и претворение в жизнь такой высокоэффективной профилактической работы, которая, в основном, снимает большой труд учителей, которые, по тем или иным причинам, бывают вовлечены в какой-либо педагогический конфликт среди ученического коллектива. Организация эффективной и действенной профилактической работы по предупреждению конфликтов в ученической среде, очень трудная работа, сопряжённая решением множества педагогических, психологических, социальных, личностно-индивидуальных задач.

Многие ученые-исследователи (Л.И. Новикова, А.А.Бодалев, В.Д.Губин, Г.Г. Дилигенский, И.А.Донцов, А.В.Зосиковский, И.С.Кон, А.Н. Луточкин, В.М.Шепель, И.Т.Фролов и др.) в своих исследованиях и научных разработках организации высокоэффективной профилактической работы придают самое серьёзное внимание. Практика и накопленный ими многолетний педагогический опыт наглядно показывает, что именно высокоэффективная профилактическая работа в ученической среде является тем фактором, который в разы снижает агрессивность подростков и создает благоприятные условия для позитивного разрешения педагогических конфликтов межличностного характера, если они по какой-либо причине все же имеют места. «Чтобы профилактическая работа по предупреждению конфликтов в ученической подростковой среде имела успех и принималась самими подростками (тоже очень немаловажный фактор), необходимо очень глубоко знать психологию подросткового возраста и в составлении с этими знаниями приступать к работе с молодыми людьми подросткового возраста» (1, 24).

Учитель средней школы, организуя профилактическую работу среди подростков по предупреждению межличностных конфликтов между ними, должен в обязательном порядке ставить перед собой следующие вопросы:

1) Зачем подростки так часто конфликтуют, почему они, можно сказать, внутренне нацелены конфликтовать по разным причинам, которые, с точки зрения взрослых людей совершенно не должны приводить к конфликту?

2) Почему подростки так агрессивны настроены, чтобы обязательно занять какие-либо лидирующее положения в классном (школьном) коллективе?

3) Почему подростки, начиная какой-либо конфликт, стараются привлечь на свою сторону как можно больше одноклассников?

4) Почему при обсуждении вопросов гендерного характера подростки проявляют агрессию, смеются, пытаются сорвать эти обсуждения? и т.п.

Конечно же, невозможно охватить разного рода вопросы целиком, которые могут в той или иной степени активности способствовать тому, что подростки очень активно вовлекаются в педагогический конфликт. Ученический коллектив – живой организм, которому присущи и взлеты, и своеобразные неудачи, и охватить одним разом все вопросы, которые могут заставить молодых людей конфликтовать друг с другом, просто невозможна. В этой связи еще раз подчеркнем большое значение организации именно высокоэффективной профилактической работы.

Следует особо подчеркнуть, что мы неоднократно подчеркиваем мысль о том, что существует большая необходимость эффективной профилактической работы. Однако же, как мы считаем, следует особенно акцентировать внимание ещё и на то, что, по существу, без активной помощи родителей учеников даже самая продвинутая профилактическая работа будет иметь серьёзные изъяны. Совместная деятельность учительского коллектива, воспитателей школы с родителями – вот, как мы считаем, должна выглядеть действенная профилактическая работа. Это, собственно говоря, можно квалифицировать как высший пилотаж совместной работы родителей и учителей школы в области предупреждения и разрешения педагогических конфликтов в школьной среде. «Специалисты отмечают, что очень часто первопричиной возникновения какого-либо межличностного педагогического конфликта среди подростков является их стремление во что бы то ни стало занять лидирующее положение» (7, 32).

Мы об этом уже упомянули и хотим сакцентировать внимание на том, что совместная профилактическая работа учителей с родителями подростков, конечно же, очень важный и действенный фактор в деле предупреждения конфликтов и всё же, подчеркнём, главная роль здесь будет отводиться именно учителю. Поэтому опираясь на свой потенциал профессионально-педагогических знаний, молодым учителям (да и пожилым учителям, что тоже может принести определённую пользу) необходимо соблюдать некоторые очень важные и обязательные условия:

а) никогда ни при каких обстоятельствах, даже если учитель видит явную абсурдность в словах учащегося-подростка, который в конфликте защищает свою позицию, не оскорблять его, не говорить ему, что он ещё не дорос до обсуждения таких серьёзных вопросов, что это не его ума дело, что он ещё профан, чтобы понимать, что к чему. Такие выражения, мгновенно сводят на нет всю работу учителя, никакого прогресса в разрешении конфликта не будет. И, что самое интересное, даже если такой учитель позже подумает над своими словами, поймёт, что он был неправ, попытается восстановить позитивные взаимоотношения к этим подросткам, ничего не получится. Удар, как говорится, был нанесен со всеми вытекающими последствиями;

б) Никогда не подчёркивать перед конфликтующими подростками своей статусной профессиональной значимости (Я учитель, больше тебя разбираюсь в этом вопросе, ты меня должен слушать и исполнять, что я тебе скажу. Если ты не согласен со мной, я буду вынужден позвать в школу твоих родителей (к слову, такая угроза вообще действует разрушающая на психику молодых людей и вызывает с их стороны только лишь открытую агрессию)). Мы были свидетелями, когда учитель школы при обсуждении конфликта пошёл именно на такой шаг, перед всем классом ученику сказал, что он сегодня же вечером с встретиться с родителями этого ученика и докажет ему его неправоту. Учитель совершил колоссальную ошибку, мало того, что он угрожает ученику-подростку, так он это делает перед всем классом. В результате, родители этого подростка пришли в школу и заявили, что учитель занял неверную субъективную позицию, что их ребёнок имеет право на своё мнение и, в результате этого разговора обвинили учителя в профессиональной непригодности. Мы понимаем, что и родители, чисто эмоционально восприняв ситуацию могут также продемонстрировать свою эмоцию, но на то и учитель, специалист с высокой профессиональной подготовкой, которой не должен допускать таких щекотливых неоднозначных ситуаций;

в) Очень большой ошибкой учителя будут его действия при обсуждении какого-либо педагогического межличностного конфликта между учениками-подростками, когда учитель на агрессивные выпады ученика теряет контроль над собой и также агрессивно отвечает ему. Конечно, в таких случаях ученик где-то может скорректировать свои действия, чтобы не усугублять агрессивное поведение учителя. Однако, и это можно со всей полнотой утверждать, что больше никогда этот ученик не обратится за помощью к такому учителю.

Помимо этого, как мы знаем классный коллектив – это большой живой организм и многолетняя совместная учёба, и другие виды деятельности уже сплотили коллектив и у них выработалась определённая субъективная оценка различных событий и проявлений. Испытав агрессивное отношение учителя к себе, ученик-подросток, обязательно, поделиться с этим с остальным классом. В результате (и такое бывает) класс поддерживая своего товарища, просто будет игнорировать такого учителя;

г) Иногда, как думают некоторые учителя (в основном, молодые) организация хорошей научно обоснованной профилактической работы с учениками-подростками, которые конфликтуют друг с другом, очень лёгкая задача. Достаточно с подростками завязать долгосрочные запанибратские отношения, шутить, громко смеяться, угощать сигаретами (часто этому можно быть свидетелями, что крайне недопустимо), обсуждать различные темы, используя сленг, неадекватные выражение и т.п.

«Такая позиция учителей где-то понятно, она продиктована желанием установить такого рода отношения с молодыми людьми, когда любые слова учителя будут восприниматься очень серьёзно и уважительно» (6, 42).

К большому сожалению, как показывает практика этого не происходит. Наоборот, некоторые подростки воспринимают такого учителя очень поверхностно, не всегда ему доверяя. Когда случаются конфликтные ситуации, такой учитель не может достаточно серьёзно повлиять на фигурантов конфликта, его просто не воспринимают как человека опытного и умудрённого. На этом основании возникают совершенно неожиданные конфликты – теперь уже этого учителя с другими подростками.

Такие учителя недоумевают, как такое может случиться, вроде у нас товарищеские отношения, мы вместе проводили время, имеет одинаковое мнение по всем вопросам, а в результате меня просто не воспринимают. Большая ошибка таких учителей заключается в том, что они совершенно искусственно начинают нивелировать свои отношения с учениками. Всё-таки какой-то фактор статусного характера между ними должен быть.

Искусственное нивелирование этого статусного составляющего не всегда адекватно понимается и воспринимается подростками - отсюда и такое сложное состояние между ними. Можно много времени проводить вместе с подростками, не выпячивая своего статусного положения, но, все-таки, оно должно быть обязательно;

д) Очень часто практически работники средней школы при разрешении какого-либо педагогического конфликта, чтобы особенно не утруждать себя, практически не вмешиваются в межличностный ученический конфликт и ограничиваются лишь тем, что просто укоряют молодых людей и на этом их участие в конфликте заканчивается.

Такое разрешение конфликта очень часто критикуется со стороны администрации средней школы, однако оно есть и имеет свои глубокие корни. По сути, администрация школы не заинтересована в том, чтобы общественность (родители, представители районных органов, Министерства была проинформирована о каком-либо конкретном конфликте школы и стараются, как говорится максимально разрешать его именно в стенах школы без широкой огласки. Именно такая поверхностная политика разрешения конфликтов очень негативно способствует тому, что учителя, воспитатели своё участие в конфликте ограничивают исключительно назиданием ученикам, что так поступать нехорошо. Такой подход абсолютно не приемлем, так как, по большому счёту, конфликт не разрешается и, что очень важно и тревожно, такое участие в «разрешении» конфликта может спровоцировать его дальнейшую эскалацию и может перерасти в открытое рукоприкладство.

Специалисты и практические работники с большим стажем профессионально-педагогической деятельности, очень часто для повышения эффективности профилактической работы по предупреждению межличностных педагогических конфликтов рекомендуют наладить тесное взаимодействие администрации средней школы с сотрудниками правоохранительных органов. «Систематическое приглашение сотрудников правоохранительных органов в школу с целью ознакомить ученический коллектив с основами законодательства, с этическими нормами поведения в обществе, по мнению специалистов, может достаточно эффективно воздействовать на позитивизацию межличностных отношений в ученической среде» (2, 56). Проводя в средней школе цикл лекций, семинаров по тематике, затрагивающей вопросы межличностного общения, будет исключительно полезно и родителям учеников, и даже учителям этой же школы. Стоит заметить и обязательно

принять во внимание такой очень важный аспект профилактической работы – никогда не пытаться навязывать какой-либо алгоритм практической деятельности ученикам.

Необходимо помнить, что подростки – это молодые люди, достаточно хорошо разбирающиеся во многих вопросах психологической работы. Они прекрасно знают, что им ничего против их собственной воли не имеют права навязывать взрослые люди. И очень глубоко ошибаются те учителя и воспитатели школы, которые думают, что большим количеством каких-либо мероприятий, загружающей свободное время подростков, можно замаять проблему межличностных ученических педагогических конфликтов, тем самым подняв уровень эффективности проводимой ими профилактической работы.

Другими словами, любая профилактическая работа должна быть в сфере интересов молодых людей и предполагающая их живое участие в ней, основываясь исключительно на добровольных началах. Это очень важный аспект профилактической работы, нарушая принцип добровольности участия учеников-подростков в ней, можно потерять доверие ученического коллектива к лицам, которые предполагают свое активное участие в деле предупреждения педагогических конфликтов в школе.

Необходимо отметить, и это, по словам практических работников и специалистов профессионально-педагогической деятельности, профилактическая работа с учениками-подростками бывает намного эффективнее и ярче именно у тех учителей и воспитателей средней школы, которые завоевали у ученического коллектива неподдельную любовь и уважение, которым молодые люди доверяют и понимают, что деятельность таких специалистов всегда объективна и заряжена большим чувством оптимизма.

Литература

1. Волков Б.С. Психология подростка. СПб.: Питер, 2010, 240 с.
2. Кадцын Л.М. Педагогическая деятельность и педагогический процесс. Екатеринбург: РГППУ, 2008, 229 с.
3. Ключко О.И., Наумова Д.В., Сухонос А.П. Педагогические конфликты: практическое руководство по их анализу и разрешению. М.: МГПУ, 2016, 128 с.
4. Коломинский Я.Л. Психология педагогического взаимодействия. СПб: Речь, 2007, 240 с.
5. Курочкина И.А. Педагогическая конфликтология. Екатеринбург: РГППУ, 2013, 229 с.
6. Профессиональная деформация личности. Томск: ТПУ, 2009, 90 с.
7. Профилактика социально опасного поведения школьников: система работы образовательных учреждений. Волгоград: Учитель, 2007, 237 с.

References

1. Volkov B. S. Psychologia teenager. S. Petersburg. St. Petersburg, 2010, 240 p.
2. Kadtsyn L. M. Actio Paedagogica et processus paedagogicus. Yekaterinburg: RGPPU, 2008, 229 p.
3. Klyuchko O. I., Naumova D. V., Sukhonosov A. P. Certamina Paedagogica: dux practicus ad eorum analysin et solutionem. Moscoviae: MGPU, 2016, 128 p.
4. Kolominsk Ya. L. Psychologia paedagogicae commercii. St. Petersburg: Oratio, 2007, 240 p.
5. Kurochkina I. A. Paedagogica conflictologia. Yekaterinburg: RGPPU, 2013, 229 p.
6. Personalitas professionalis deformatio. Tomscum: TPU, 2009, 90 p.
7. Praeventionis socialiter periculosos mores puerorum: systema operis institutionum institutionum. Volgograd: Uchitel Publ., 2007, 237 p.

Psychological sciences

PSYCHOECONOMIC APPROACH TO ADULTS' FINANCIAL BEHAVIOR: THEORETICAL INSIGHTS

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ПСИХОЕКОНОМІЧНИЙ ПІДХІД ДО ФІНАНСОВОЇ ПОВЕДІНКИ ДОРΟΣЛИХ: ТЕОРЕТИЧНІ АСПЕКТИ

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Abstract

This paper explores the psychoeconomic approach as a theoretical framework for understanding adult financial behavior through the interaction between psychological mechanisms and economic conditions. It highlights the role of financial literacy, individual success, and personality traits in decision-making. The study also examines unconscious motives, behavioral economics, and social learning as key factors shaping financial habits. Particular attention is paid to cognitive biases, emotional influences, and cultural norms that affect individual choices in the financial domain. The paper emphasizes the importance of combining psychological theories with economic knowledge for more effective financial behavior regulation.

Анотація

Розглянуто психоекономічний підхід як комплексний аналіз взаємозв'язку між економічними умовами та психологічними процесами, які визначають фінансову поведінку дорослих. Описано теоретичні основи формування економічної ідентичності, вплив фінансової грамотності, успішності та психологічних характеристик особистості на фінансові рішення. Проаналізовано соціально-когнітивні та психоаналітичні аспекти ставлення до грошей, роль емоцій, когнітивних упереджень та соціального навчання у формуванні поведінкових моделей. Поведінкова економіка представлена як приклад застосування психологічних знань для підвищення раціональності у фінансовому виборі.

Keywords: *financial behavior, psychoeconomics, economic identity, cognitive biases, money, behavioral economics*

Ключові слова: *фінансова поведінка, психоекономіка, економічна ідентичність, когнітивні упередження, гроші, поведінкова економіка*

Психоекономічний підхід до аналізу фінансової поведінки дорослих осіб передбачає вивчення глибинного взаємозв'язку між економічним контекстом, в якому перебуває людина, та її психологічними характеристиками, які впливають на фінансові рішення. На відміну від традиційних економічних теорій, що спираються на поняття «раціонального агента», психоекономіка визнає значний вплив емоцій, упереджень, досвіду та соціальних факторів на економічну активність.

Науковці наголошують на тому, що фінансова поведінка — це прояв як індивідуального досвіду, так і культурно-соціальних норм. Наприклад, Н. Дембицька визначає економічну культуру особистості як сукупність психолого-економічних характеристик, що формується внаслідок економічної соціалізації [1]. Ці характеристики включають уявлення про «ідеального економічного суб'єкта» і сприяють адаптації людини до умов ринку. В. Хащенко акцентує увагу на формуванні економічної ідентичності, що залежить від особистісних та соціально-культурних чинників. Економічна ідентичність виступає внутрішнім регулятором фінансової активності й визначає здатність людини реалізовувати себе у фінансовому вимірі.

Теоретичні засади психоекономіки передбачають аналіз поведінки не лише через мотивацію до прибутку, але й через систему цінностей, рівень тривожності, настанови щодо заощаджень чи інвестицій, а також сприйняття ризику. Економічна поведінка включає широкий спектр мотивів, які не зводяться до прагнення вигоди, а є наслідком дії соціальних інституцій і культурних зразків.

Фінансова грамотність є важливим фактором економічної адаптації. Дослідження Н. Захарової, С. Осипенка та С. Павленко показують, що розвиток фінансової обізнаності підвищує здатність особистості здійснювати обґрунтовані економічні дії, знижує ймовірність імпульсивних витрат та забезпечує стратегічне планування [6]. Успішність, як риса особистості, що виявляється в умінні досягати цілей і зберігати стійкість до стресу, також є чинником ефективної фінансової поведінки [2].

Окрему увагу заслуговує психологічне ставлення до грошей. За висновками О. Нікітіної, Т. Хомуленко та А. Іванченка, індивідуальні установки щодо накопичення, витрат і контролю фінансів формуються під впливом внутрішніх мотивацій і соціального досвіду [4]. Таким чином, гроші виступають не лише економічним ресурсом, а й соціально-психологічним символом, який відображає систему цінностей особистості.

Згідно з психоаналітичним підходом, ставлення до грошей може бути пов'язане з несвідомими переживаннями дитинства, зокрема почуттям контролю, безпеки або провини. Фрейд розглядав гроші як символ влади, компенсації та заміщення об'єктів любові. Дослідники Steinmair & Löffler-Stastka підкреслюють, що несвідомі конфлікти, пов'язані з батьківськими фігурами, здатні гальмувати насолоду фінансовим успіхом та призводити до ірраціональної поведінки — страху витрат, накопичення чи уникнення інвестицій [5].

У рамках поведінкової економіки особливе місце займають когнітивні упередження. Наприклад, теорія перспектив Канемана і Тверські пояснює схильність людей більше боятися втрат, ніж прагнути виграти однакової вартості. Це призводить до уникнення ризиків навіть у ситуаціях, де ризик є вигідним. Інші упередження, такі як надмірна впевненість або слідування за натовпом, спотворюють фінансові рішення і збільшують ризик помилок.

Поведінкова економіка розробляє практичні інструменти, спрямовані на коригування цих упереджень. Так звані «підштовхування» (nudges) — це м'які інтервенції, що сприяють прийняттю раціональніших рішень, наприклад, автоматичне зарахування до пенсійних програм або подання фінансової інформації у зручному фреймі.

Соціально-когнітивний підхід акцентує увагу на ролі соціального навчання. Дослідження Mahapatra et al. свідчать, що люди схильні моделювати власну фінансову поведінку, спостерігаючи за іншими, зокрема членами родини, друзями або колегами. Установки, сформовані у спільнотах, впливають на розвиток навичок заощадження, планування бюджету, ставлення до кредитів тощо. У контексті нестабільності, наприклад пандемії COVID-19, роль емоцій, стереотипів і реакцій спільноти особливо посилюється [3].

Таким чином, психоекономічний підхід дає змогу осмислити фінансову поведінку як результат складної взаємодії особистих характеристик, соціального контексту, культурних норм і несвідомих мотивів. Це відкриває нові перспективи для досліджень і практики у сфері підвищення фінансової компетентності та формування свідомої економічної поведінки дорослого населення.

Список літератури

1. Dembytska, N. M. (2014). Features of the development of economic culture of personality in school years. *Actual Problems of Psychology: Collection of Scientific Papers of H. S. Kostiuk Institute of Psychology*, 10(26), 270–282. [Published in Ukrainian]
2. Ilchyshyn, O. V. (2021). Key aspects of the formation of a financially literate personality. [Published in Ukrainian]
3. Mahapatra, M., Raveendran, J., & De, A. (2019). Building a Model on Influence of Behavioural and Cognitive Factors on Personal Financial Planning: A Study Among Indian Households. *Global Business Review*, 20, 1009–996.
4. Nikitina, O. P., Khomulenko, T. B., & Ivanchenko, A. D. (2020). Psychology of monetary orientation of personality. [Published in Ukrainian]
5. Steinmair, D., & Löffler-Stastka, H. (2022). Personalized treatment – which interaction ingredients should be focused to capture the unconscious. *World Journal of Clinical Cases*, 10, 2053–2062.

6. Zakharova, N., Osypenko, S., & Pavlenko, S. (2023). *Formation of financial literacy on the basis of a competence-based approach. Scientific Bulletin of the Melitopol State Pedagogical University named after Bohdan Khmelnytsky. Series: Pedagogy, (2(29)), 33–40. [Published in Ukrainian]*

Sociological sciences

MONITORING AND FORECASTING OF EMERGENCY SITUATIONS

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Abstract

The article discusses the monitoring and forecasting of emergency situations. The essence of monitoring and forecasting emergency situations lies in observing the condition of certain structures, objects, events, and processes. The results of this monitoring are used for warning about emerging threats and providing information support to management authorities. In the article, the author has examined and interpreted the issues of warning and elimination of emergency situations.

Keywords: *emergency situations, monitoring, forecast, environment, anthropogenic impact, technogenic, ecological system, hydrometeorological service, chemical-radiological.*

It is impossible to plan the development of a territory, make decisions on the construction of industrial and social facilities, or develop programs and plans for the warning and elimination of possible emergency situations without considering data on the monitoring and forecasting of emergencies. The term monitoring is derived from English [from Latin monitor – one who warns, protects] and refers to a system of observation (including assessment and forecasting) over the condition and development of natural, technogenic, and social processes and events.

Its essence lies in monitoring the state of certain structures, objects, events, and processes. The results of this monitoring are used to issue warnings about emerging dangers and to provide informational support to management authorities. This information is used to develop and make management decisions aimed at changing the state and development of the system, process, or event in the necessary direction.

Observation of the environment consists of a set of specific measures. This system should ensure the identification of the environmental condition, its individual elements, types of technogenic impacts, and also the determination of parameters that characterize natural, physical, chemical, and biological processes occurring in the environment.

The quality of monitoring directly affects the effectiveness of reducing the occurrence and scale of risks. Objects of monitoring may include ecological systems, technogenic facilities, or objects of natural-technogenic character. The results of monitoring serve as a starting basis for the development of long-term, medium-term, and short-term targeted programs and plans, as well as for making relevant decisions regarding the warning and elimination of emergency situations.

The purpose of monitoring is to observe, control, assess the condition of the environment or objects that may cause emergencies, to forecast their development, to increase the accuracy and reliability of forecasts, and to provide informational support for the preparation and adoption of management decisions.

This is only possible through the integration of the intellectual, informational, and technological capabilities of various agencies and organizations involved in monitoring different types of hazards. The data obtained from monitoring forms the basis of forecasting. The essence and purpose of emergency monitoring consist of determining the scale and impact of hazardous natural and technogenic events that are sources of emergency situations, through observations, control, and forecasting of the dynamics of emergency development, in order to organize the warning of disasters and ensure the elimination of their consequences.

The emergency monitoring and forecasting system includes, as a complex of main elements, a set of technical means and a system of methods for observation, data processing, and analysis of the situation. Preventive measures to avoid the occurrence and development of emergency situations are developed based on the analysis of their possible causes, as well as their sources in past and present stages. According to official documents, the emergency monitoring and forecasting system should consist of the following main elements:

- *organizational structure;*
- *general system model including object monitoring;*
- *a complex of technical means;*
- *models of situation development;*
- *methods for observation, data processing, analysis, and forecasting;*
- *information system.*

The classification of emergency monitoring can be described as follows: considering the sources and factors of anthropogenic impacts, the reaction of the biosphere to these impacts, observation methods, etc., there are a large number of monitoring types that differ from each other.

According to the type of influencing factors, the following types of monitoring are distinguished:

- *radiation,*
- *chemical,*
- *biological,*
- *seismic, etc.*

Depending on the scale, five levels (or stages) of emergency situations are distinguished:

- *global,*
- *national,*
- *regional,*
- *local,*
- *site-specific (local).*

Each lower-level monitoring is a component of the level above it. Relevant state structures play an important role in the monitoring and forecasting of emergency situations, and they organize and carry out the following: monitoring sources of anthropogenic impact on the natural environment; monitoring of terrestrial fauna and flora, including forests; monitoring of aquatic environments in water bodies and wastewater areas; monitoring and forecasting of hazardous geological processes, including exogenous and endogenous geological processes and groundwater.

At the state level, the main issues of monitoring are as follows: various research methodologies are used to obtain the initial data necessary for assessing the condition of the natural environment; with the help of instruments, physical and chemical parameters of the environment are usually measured, including the quantity and spectra of sound, temperature, characteristics of electromagnetic fields, characteristics of radioactive contamination of the environment, characteristics of geophysical events, and concentrations of chemical pollution in air, water, soil, etc.; with the help of instruments, numerous characteristics of biological systems are also determined. Remote sensing of ecological systems using airplanes, artificial satellites, and spacecraft is widely applied.

The Hydrometeorological Service monitors the quality of atmospheric air, especially in environmentally hazardous areas; the quality of surface and underground waters; the degree of soil contamination by industrial-origin pesticides and toxins; and individual radiation incidents. It forecasts air conditions and many natural disasters. This service obtains the necessary information from its own observation systems, the World Meteorological Organization, and similar services of neighboring countries.

The Sanitary-Epidemiological Service of the Ministry of Health monitors: the air quality within the sanitary protection zones of large enterprises; the quality of drinking water in water intake points and after purification; and the implementation of sanitary measures at various facilities.

State supervisory authorities organize and carry out the monitoring of the condition of technogenic facilities and the forecasting of accident hazard levels. Control bodies, as well as the executive bodies of entities and the industrial safety departments within enterprises and organizations, also perform this work. In addition, other monitoring services are also active.

The main responsibilities of regional and local monitoring centers are as follows:

- *Collecting, analyzing, and presenting information on potential sources of emergencies and their causes in regions and territories to the relevant government authorities;*
- *Forecasting emergencies and their scale;*
- *Providing organizational and methodological leadership, coordination, and supervision over the activities of regional and local bodies within the emergency monitoring and forecasting system;*
- *Organizing and overseeing laboratory analyses of the chemical-radiological and microbiological conditions of natural environment objects, food products, food and feed raw materials, and water, which determine the potential hazard level of emergencies;*
- *Creating and developing emergency databases and GIS systems;*

- Organizing information exchange, coordinating, and supervising the activities of territorial monitoring centers.

Automated monitoring systems used in management of monitoring, laboratory control, and forecasting of emergency situations utilize the following monitoring methods: remote forecasting methods; computer-based data processing methods; physico-chemical methods; statistical and mathematical data processing methods; and geographic information systems (GIS).

In modern times, automated systems for monitoring and forecasting emergencies are being established and developed in large cities with the potential for technogenic and natural emergencies. These systems significantly increase the efficiency of operations and help in eliminating and preventing the consequences of emergencies. The operator functions of automated emergency monitoring and forecasting systems are carried out by operators who work continuously in shifts at automated workstations within the management system.

The prospective directions for organizing the monitoring system—the main focuses of this system—are as follows:

- Observation, assessment, forecasting, and control of hazardous natural and technogenic processes and events affecting the environment;
- Collection, processing, analysis, and generalization of data on the energy-containing space on Earth and in near-Earth space to detect anomalies that serve as precursors to hazardous natural events;
- Systematic inspection measurements of background parameters of the natural environment's condition;
- Observation, assessment, and forecasting of the hazard of transboundary and transregional transport of dangerous substances and other negative impacts;
- Timely detection and indication of radioactive contamination, chemical and biological pollution of drinking water, food and feed raw materials, food products, and environmental objects;
- Comprehensive assessment of the human living environment; preparation and use of ecological, meteorological, seismic prognostic, and other maps for specific areas, regions, and the entire country;
- Operational collection, processing, and submission of information about potential sources of natural, technogenic, and biological-social emergencies to local management bodies; creation and maintenance of databases on emergencies and their sources; forecasting the emergence and consequences of hazardous natural and technogenic events;
- Monitoring the dynamics of processes at individual industrial, agricultural, and other facilities;
- Timely identification, detection, and forecasting of the development of accidents and technogenic disasters, as well as harmful and damaging factors formed in these accidents and disasters—i.e., levels of physical fields, radioactive, chemical, and biological substances;
- Assessment of the hazard level of the ecological situation arising during normal operation of hazardous facilities as well as during accidents and emergencies.

These fundamentals are organized within their respective spheres of activity by relevant ministries, agencies, local executive authorities, and organizations (enterprises) using ground-based and aviation-space means.

The main component used during operations is ground-based means, which include laboratory control and observation networks over the environment, as well as control and diagnostic tools for the condition of potentially hazardous economic objects.

Space-based monitoring tools are primarily designed for identifying and refining the status of large-scale hazardous natural events and processes such as forest fires with insignificant dynamics, floods, and others. Additionally, observations from space devices are used to monitor the environment, anthropogenic disasters, and military conflicts, as well as atmospheric events that can lead to natural disasters. These tools allow for the detection and reliability assessment of anomalous geophysical phenomena related to ocean probing, ocean surface temperature, changes in wind speed and direction, the state of currents, tanker accidents, and ocean pollution.

Aviation tools are used for the purposes of space-based tools as well as for obtaining information on radiation conditions, situations in large-scale destruction zones, main pipelines, and other conditions (roads, snow, ice, etc.). They offer broader capabilities both in terms of the composition of observed objects and operational efficiency compared to space-based tools, which is why they are widely used in many monitoring services.

Conclusion. Effective monitoring and forecasting systems—utilizing ground, aerial, and space technologies—are essential for timely detection, assessment, and management of natural and technogenic emergencies, ultimately helping to reduce risks and mitigate their impacts.

References

1. Nagiyev, N.T., & Safarov, S.H. (2019). *Forecasting and Monitoring of Emergency Situations*. Baku: 432 pages.
2. Ocaqov, H.O., & Hacimetov, Q.N. (2011). *Monitoring and Forecasting of Emergency Situations (Textbook)*. Baku: 436 pages.
3. Safarov, S.H. (2011). *Fundamentals of Meteorological Forecast Methods*. Baku: 232 pages.
4. Aliyeva, I.S. (2011). *Hydrology of Lakes and Reservoirs*. Baku: 216 pages.
5. Mammadov, M.Ə. (2002). *Hydrography of Azerbaijan*. Baku: 266 pages.
6. www.fhn.gov.az
7. www.google.az
8. www.e-qanun.gov.az

Technical sciences

ANALYSIS OF ENERGY CONSUMPTION IN THE PROCESSES OF DRYING PLANT RAW MATERIALS

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In processing operations, most medicinal plants should be dried as quickly as possible, whenever feasible, since various biochemical processes may occur in their tissues that significantly reduce the quality of the raw material. Traditionally, natural energy sources are used for drying medicinal plants.

The most widely used methods are solar-air drying and drying in the "shade." Under favorable weather conditions and by following centuries-old practices of using natural technologies for drying medicinal plants, it is possible to obtain medicinal products of acceptable quality. However, weather conditions often do not permit the use of natural energy sources, which is why artificial energy sources have been increasingly employed in recent years in the processing of medicinal plants [1].

In many guidelines, it is recommended to use technologies and equipment for drying medicinal plants that operate on the principle of burning solid, liquid, or gaseous fuels. Such recommendations have been developed, for instance, for processing Jerusalem artichoke into a medicinal preparation for diabetes patients, where high-temperature flame-based units are proposed for raw material drying.

The most effective approach in this area is the development of technologies and equipment based on combined methods of heat and mass transfer, especially those that integrate both man-made and natural energy sources. The survival principle, as applied to this issue, dictates that the proportion of man-made energy in such combinations should gradually decrease.

A classical example of combining man-made and natural energy is the use of intermittent infrared (IR) radiation in the thermal treatment of plant materials. Research by A.V. Lykov and others has shown that the use of intermittent IR radiation in thermal processing not only reduces energy consumption but also significantly improves the quality of the final product. Even greater results can be achieved through the use of controlled intermittent IR radiation during thermal treatment processes.

Modern designs of domestic and foreign technical equipment for the thermal treatment of plant materials using non-electric methods typically operate using heat carriers obtained from the combustion of solid, liquid, or gaseous fuels.

One of the most effective classifications of technical equipment is based on the type of energy carrier used. Depending on the heat source, all technical equipment used for thermal processing of plant raw materials can be divided into three main groups: Equipment with steam or water heat sources; Equipment with flame-based heat sources; Equipment with electric heat sources.

Equipment using steam and water heat sources is primarily applied in the thermal processing of root and tuber crops, preparation of feed mixtures, milk pasteurization, and processing of natural plant products.

Equipment with flame-based heat sources is the most widely used in technologies for processing plant raw materials.

According to their operation, dryers can be classified into batch dryers with periodic loading and unloading of the entire material (tray dryers), and continuous dryers, where the loading and unloading processes occur continuously.

Tray dryers are the simplest and most affordable, and they are highly versatile, as they can be used to dry not only grass, grain, and other types of feed, but also cotton, wood, and various other materials. However, tray dryers have several significant drawbacks. The fuel consumption per kilogram of moisture removed is 6000–7000 kJ. The dried product often has uneven moisture content. The drying process can take from 1 to 4 hours. Additionally, a significant amount of manual labor is required for loading, unloading, and leveling the material.

Conveyor dryers use a drying agent with a temperature of 120–150°C, and the drying time ranges from 40 to 90 minutes. They eliminate many of the drawbacks found in tray dryers by ensuring a

continuous drying process, reducing manual labor, and improving heat utilization. However, conveyor dryers also have disadvantages, such as uneven drying, overheating, increased energy consumption for moisture evaporation, and considerable carotene loss.

Pneumatic-tube dryers are characterized by good selectivity: the finest particles of the plant material dry quickly and are carried out of the dryer. However, they also have several drawbacks, including high electricity and fuel consumption, lack of versatility, and significant specific capital investment.

The majority of wild and some cultivated plants are suitable for use in medicine [2]. However, the techniques, methods, and means of drying plant raw materials by artificial means differ from those described earlier. The choice of drying methods, techniques, and equipment for medicinal plants should be based on several factors: the type of raw material, its initial and target moisture content, the ecological safety of the final product, and the selection of drying regimes that preserve all microelements in the medicinal raw material.

Thermal drying with artificial heating is optimal for all types of raw materials, but the temperature regime must be set individually for each type. Herbs, leaves, flowers, roots, rhizomes, and bulbs are dried at 50–60°C; fruits and seeds at 70–90°C; and raw materials containing essential oils at 35–40°C. Special dryers are used for this purpose.

Properly dried plant raw materials contain 10–15% of hygroscopic moisture. Drying is considered complete when the raw material reaches the following conditions: leaves, flowers, and inflorescences are easily crushed into powder, fruits do not form clumps when pressed, and berries separate freely.

The moisture content of various types of medicinal plant raw materials is regulated by normative and technical documents, state standards, and technical specifications. If the material becomes overdried—leading to excessive crumbling—it is recommended to increase its moisture by storing it for some time in a room with high relative humidity [3].

As seen from the overview, steam- or water-based energy sources, as well as energy derived from the combustion of liquid, solid, or gaseous fuels, are widely used in the thermal processing of wild and cultivated raw materials. However, flame-based technology has several significant drawbacks. It is difficult to maintain a stable temperature regime, and regulation is even more challenging. As a result, the final product is often of low quality and lacks a desirable market appearance.

Replacing flame-based energy systems with electric drying technologies for plant raw materials often leads to fundamentally new machine designs.

References

1. Nurhaslina, C. R., Andi Bacho, S., & Mustapa, A. N. (2022). Review on drying methods for herbal plants. *Materials Today: Proceedings*, 63, S122–S139. <https://doi.org/10.1016/J.MATPR.2022.02.052>
2. Gunjal, S. D., & Shirolkar, S. v. (2020). An Overview of Process Parameters and Spray drying agents involved in Spray drying of Herbal Extracts. *Paideuma Journal*, 13(17).



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