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# NEXUS BETWEEN ENTREPRENEURSHIP AND POVERTY REDUCTION: REGRESSION ANALYSIS OF CAUSALITY

Poverty reduction remains a key priority of Kazakhstan's socio-economic policy. While entrepreneurship is widely acknowledged as a driver of economic growth, its association with poverty alleviation in the country remains insufficiently explored. A comprehensive analysis of this relationship is essential for enhancing policy effectiveness.

This study examines the associations between entrepreneurial activity, business incentives, and poverty reduction in Kazakhstan. The Human Development Index (HDI) is employed as the dependent variable, as it encapsulates not only income levels but also access to education and healthcare.

The study applies linear, logarithmic, and semi-logarithmic regression models, addressing potential issues of multicollinearity and autocorrelation. The independent variables include entrepreneurial activity, business development incentives, trade openness, urbanization, and corruption control.

The results confirm that entrepreneurship and business incentives play a crucial role in poverty reduction. Increased entrepreneurial activity contributes to job creation, income growth, and improved access to essential services. Furthermore, the study highlights the significance of reducing administrative barriers and strengthening anti-corruption measures to foster business development. Additionally, urbanization and trade openness are identified as significant determinants of economic progress.

Unlike traditional studies that focus solely on income-based measures, this research employs HDI as a comprehensive indicator of human development. The findings offer valuable insights for policymakers in designing effective entrepreneurship policies, optimizing regulatory frameworks, and enhancing governance mechanisms to promote sustainable economic growth and poverty reduction in Kazakhstan.

**Key words:** poverty, entrepreneurship, Human development index, urbanization, trade.

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## Кәсіпкерлік пен кедейлікті азайту арасындағы байланыс: себеп-салдарлық регрессиялық талдауы

Кедейлікті азайту – Қазақстанның әлеуметтік-экономикалық саясатының басым бағыты. Кәсіпкерлік экономикалық өсудің маңызды факторы ретінде мойындалғанымен, оның кедейлікті төмендетуге ықпалы әлі де жеткілікті зерттелмеген. Бұл байланысты кешенді талдау мемлекеттік саясаттың тиімділігін арттыруға мүмкіндік береді.

Бұл зерттеу кәсіпкерлік белсенділік, бизнеске ынталандыру шаралары мен кедейлікті төмендету арасындағы өзара байланысты талдайды. Тәуелді айнымалы ретінде Адам дамуы индексі (HDI) алынған, ол табыстан бөлек, білім мен денсаулық сақтауға қолжетімділікті де қамтиды.

Зерттеуде линейлік, логарифмдік және жартылай логарифмдік регрессиялық модельдер қолданылып, мультиколлинеарлық пен автокорреляция мәселелері ескерілді. Тәуелсіз айнымалылар ретінде кәсіпкерлік белсенділік, бизнеске ынталандыру, сауданың ашықтығы, урбанизация деңгейі және сыбайлас жемқорлықты бақылау қарастырылды.

Зерттеу нәтижелері кәсіпкерлік пен бизнеске ынталандыру шараларының кедейлікті төмендетуде маңызды рөл атқаратынын көрсетті. Кәсіпкерліктің дамуы жұмыс орындарының көбеюіне, халық табысының артуына және әлеуметтік қызметтерге қолжетімділікті кеңейтуге ықпал етеді. Сонымен қатар, әкімшілік кедергілерді азайту және жемқорлықпен күресті күшейту бизнес ортасының дамуына оң әсер етеді. Сондай-ақ, урбанизация мен сауданың ашықтығы экономикалық өсімнің маңызды факторлары болып табылады.

Дәстүрлі зерттеулер табыс көрсеткіштеріне ғана сүйенсе, бұл жұмыс Адам дамуы индексін

кәсіпкерлікті дамыту стратегияларын жетілдіру, құқықтық реттеуді оңтайландыру және мемлекеттік басқару сапасын арттыру арқылы Қазақстандағы тұрақты экономикалық өсім мен кедейлікті төмендетуге бағытталған ұсыныстар жасауға негіз болады.

**Түйін сөздер:** кедейлік, кәсіпкерлік, Адам даму индексі, урбанизация, сауда.

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**Взаимосвязь между предпринимательством и снижением бедности: регрессионный анализ причинно-следственности**

Снижение уровня бедности остается одной из ключевых задач социально-экономической политики Казахстана. Несмотря на признанную роль предпринимательства в обеспечении экономического роста, его взаимосвязь с сокращением бедности остается недостаточно изученной. Глубокий анализ данной зависимости необходим для повышения эффективности государственной политики.

В исследовании анализируется взаимосвязь между предпринимательской активностью, мерами поддержки бизнеса и снижением бедности в Казахстане. В качестве зависимой переменной используется Индекс человеческого развития (HDI), который охватывает не только уровень доходов, но и доступ к образованию и медицинским услугам.

Применены линейные, логарифмические и полу-логарифмические регрессионные модели с учетом возможных проблем мультиколлинеарности и автокорреляции. В качестве независимых переменных рассматриваются предпринимательская активность, бизнес-стимулы, открытость торговли, уровень урбанизации и контроль коррупции.

Исследование подтверждает, что предпринимательство и меры поддержки бизнеса являются важными факторами снижения бедности. Рост предпринимательской активности способствует созданию рабочих мест, увеличению доходов населения и расширению доступа к социальным услугам. Кроме того, подчеркивается важность снижения административных барьеров и усиления антикоррупционной политики для стимулирования деловой среды. Также урбанизация и открытость торговли оказывают значительное влияние на экономическое развитие.

В отличие от традиционных исследований, ориентированных исключительно на показатели доходов, данная работа использует HDI как интегральный показатель человеческого развития. Полученные результаты могут быть использованы при разработке эффективной политики поддержки предпринимательства, совершенствовании нормативно-правового регулирования и повышении качества государственного управления, что будет способствовать устойчивому экономическому росту и снижению бедности в Казахстане.

**Ключевые слова:** бедность, предпринимательство, Индекс человеческого развития, урбанизация, торговля.

## Introduction

The fight against poverty is becoming the main problem of international organizations, as well as many countries around the world. Even when the global poverty rate has decreased significantly over the past 30 years, this issue is still relevant. According to the World Bank, between 1985 and 2020, the poverty rate only decreased from year to year, but the Covid-19 pandemic, which began in 2020, reversed this steady decline. The pandemic has negatively affected the quality of life of the population and the well-being of the world's population and, consequently, increased the number of poor (Battilana et al., 2020).

Obviously, poverty and income inequality are a problem that attracts the attention of the entire world's population. The fight against poverty is an urgent SDG issue that must be addressed first. According to the Global Multidimensional Poverty Index 1.1 billion people worldwide live below the poverty line in 2024. And about half of them, 455 million people, are in countries where there is conflict in the world, in conditions of political instability.

Over the years, leaders of various states and social organizations have developed many international programs, paying special attention to social issues such as improving the country's well-being, improving the quality of life, developing human capital, reducing poverty and income inequality. However, this problem has not been completely solved in the world, and even extreme poverty occurs from all over any developed, developing, or remaining country in the world (Rindova et al., 2019).

The poverty rate in the Republic of Kazakhstan in 2024 was 5.4%, 1 million 619 thousand people

(Our world in data, 2024). However, it is worth noting that, according to World Bank statistics, the poverty rate in our country is 15.5% (World Bank, 2024). We believe that these two differences are the result of a gap in the measurement of poverty. The difference in poverty rates (5.4% vs. 15.5%) arises from different measurement methodologies. The Bureau of National Statistics of Kazakhstan calculates poverty based on the national subsistence minimum, while the World Bank uses international poverty lines ($3.65 and $6.85 per day, PPP). The World Bank also considers broader socio-economic factors like education and healthcare, leading to a higher estimate. Additionally, variations in survey methods and data sources contribute to discrepancies. These differences highlight the need to consider both national and international measures for a comprehensive poverty assessment.

Investments, microfinance, social assistance and others that have been widely used in the Republic of Kazakhstan so far have not been able to significantly reduce poverty. Therefore, effective methods and tools are now needed to combat poverty.

The impact of entrepreneurship development on poverty reduction has only recently been analyzed more and more by scientists. Through the development of entrepreneurship, new private enterprises will be opened in the state, and even existing ones will be scaled, respectively, a lot of new jobs will be created in the market. Thanks to new jobs, the incomes of the poor are increasing, the quality of life is improving, and the poverty rate is decreasing. The development of entrepreneurship can have a direct positive impact on the economic development of the country, positively affect the emotional state of the population, increase the motivation of the population to develop and move forward. This is due to the fact that recently more and more scientists have been studying the socio-emotional states of the poor population, and not just the lack of monetary income for the poor population (Steven at al., 2020).

This article analyzes the HDI index as an index for measuring poverty. The Human Development Index plays a very important role in measuring poverty. This is due to the fact that the human development index is an important indicator that takes into account not only the low monetary income of the population, but also education, health and standard of living of the population. For this reason, this index can also be used for large-scale poverty measurements. The HDI takes values from 0 to 1. 1 is the maximum value. Human potential development is not only about increasing the efficiency of the national economy in a country, it means increasing the population's ability to receive the necessary resources for education, better health, higher incomes, and a healthy lifestyle. And people who have received education and health are moving out of poverty and increasing their desire to improve their standard of living (UNDP, 2025).

The purpose of this work is to study the impact of incentives for the development of entrepreneurship and entrepreneurship in Kazakhstan on poverty reduction. All statistics were obtained from official World Bank and UNDP data from 2011 to 2024.

**Literature Review**

*The problem of poverty*

The general concept of poverty arises primarily from material scarcity, which we refer to as the lack of housing and food necessary for existence. And then, upon departure, we note the lack of access to basic services (health, education). However, in the modern understanding of poverty, scientists are also increasingly studying the lack of non-material needs, which include social security, insecurity of rights, social bullying, social isolation, etc. Therefore, there are many difficulties for scientists in measuring the modern concept of poverty and developing ways to combat poverty. Even today, there is no definition that can fully describe the concept of poverty (Bitler et al., 2024).

According to Liang's definition (2025), poverty is hunger. Poverty is the lack of housing. Poverty is a fear for the future, the inability to find a job at all. Scientists, investigating the cause of poverty and income inequality, said that the more family members there are, the fewer educational and working opportunities there are for the family, and, accordingly, this condition leads to poverty (Chakrabartty, 2023).

Poverty and income inequality are the main factors. The more income a country's income is unevenly distributed, the poorer people become even more impoverished. Poverty is a social situation that arises from the lack of basic material conditions such as clean drinking water, food, sanitation, and housing (Othman et al., 2024).

Some scientists point out that there is a difference in the definition of poverty in developed and developing countries. For example, the poor in developed countries classify people only if their basic needs, such as housing, food, health, and education, are not being met. But the concept of the poor population in developed countries is different, that is, the poor population in these countries continues to treat the poor population, even if family finances do not satisfy all their desires, they feel excluded from so-

ciety, they feel worse than other people (Olofin et al., 2024).

Amartya Sen's work on poverty extends beyond material deprivation and emphasizes capabilities – the ability of individuals to achieve valuable life outcomes. Sen (1999) argued that poverty is best understood as the deprivation of basic freedoms, which includes not only the lack of income but also limited access to education, healthcare, and political participation. His capability approach has been widely adopted in measuring poverty, influencing frameworks such as the Human Development Index (HDI) and the Multidimensional Poverty Index (MPI).

Martin Ravallion, a leading economist in poverty research, contributed significantly to poverty measurement and policy evaluation. His works (Ravallion, 2016;) focused on absolute versus relative poverty, the effectiveness of anti-poverty programs, and the limitations of traditional income-based poverty measurements. Ravallion emphasized that economic growth alone is not sufficient to reduce poverty; the structure of growth and social policies matter. He developed the $1.90 per day international poverty line, which the World Bank uses to track extreme poverty.

*Poverty in Kazakhstan*

Research on poverty in Kazakhstan highlights the transition from a centrally planned to a market economy and the resulting economic disparities. Studies indicate that poverty in Kazakhstan is heavily influenced by regional inequality, urban-rural disparities, and the effectiveness of social protection policies (Akhmetova & Izimov, 2023; Satybaldin et al., 2022).

Key findings in the Kazakhstani context include:

- Regional disparities: The western and oil-rich regions have lower poverty rates, while southern and rural areas face persistent poverty.

- Social protection programs: Kazakhstan has introduced various targeted social assistance (TSA) programs, but their effectiveness is debated. Some scholars argue that these programs reduce poverty only temporarily without addressing structural causes (Nurgaliyeva & Abdullayeva, 2021).

- Energy and food security impact: Recent studies (Mukhamediyev et al., 2024) suggest that rising energy costs and food insecurity exacerbate income inequality, disproportionately affecting low-income groups.

*Development of entrepreneurship*

Entrepreneurship is a special type of economic activity aimed at making a profit, aimed at high responsibility and innovation. Currently, there is no single clearly defined definition of entrepreneurship. An entrepreneur, spending his precious time and effort to come up with something new, risking psychological and financial risks, respectively, makes a profit in the form of remuneration for his work. Noruzi et al. (2021) in his article, he tried to comprehensively study entrepreneurship from a psychological, managerial, and economic point of view.

According to Hamed et al. (2024), the advantage of an individual entrepreneur over an employee is that he can benefit from doing business without pursuing only financial benefits as a result of his work. However, the difficulty of an individual entrepreneur is explained by the fact that he takes on all losses even in the event of bankruptcy.

And Xiong & Sun (2025) emphasized the benefits of entrepreneurship for the population by creating new jobs, producing new goods or services. Entrepreneurship in general leads to the emergence of new business opportunities, new initiatives, and new economic resources in order to make a profit. Such skills allow an entrepreneur to run his business effectively, to think adequately in emerging difficulties and situations.

A modern entrepreneur is a person who comes up with an innovative idea, gets new jobs, new goods or services for the state, can effectively manage their activities without harming the environment, can compete with entrepreneurs from around the world, can take risks, can build a long-term strategy, and make a profit as a result of their work (TorBjörn, 2024).

*The impact of entrepreneurship on poverty reduction*

The impact of entrepreneurship in general on poverty reduction has only recently been increasingly analyzed. Several works by scientists in the field of economics and management have been studied, which have drawn attention to this problem.

Zainol et al. (2024), in his article on the relationship between entrepreneurship and poverty, said that in developing countries, the poor can improve their social situation through self-employment. Such jobs include, for example, baking bread or pies at home, cleaning or sewing work, etc.

According to Kayenga & Mukanyangezi (2021), entrepreneurship in developing countries has a direct positive impact on economic development and poverty reduction. That is, in most cases, the poor population cannot get a job, since the services provided by the state may be deprived of the education and qualifications of the poor population, and the poor population will be employed by jobs offered by entrepreneurs. Accordingly, entrepreneurs cre-

ate conditions for these people by taking advanced training courses and increasing their ability to work. These classes should be funded by the state.

Indeed, in developing countries, when the poor cannot get a job, they have the opportunity to engage in self-employment and improve their social status. In other words, entrepreneurship is considered as the main instrument of economic development. The development of entrepreneurship is changing the welfare situation in the country. That is, it gives people the opportunity to become economically independent, improve their thinking abilities and increase their incomes even more, despite stable wages. This has a positive effect on the well-being of society (Masa et al., 2024).

The impact of urbanization on poverty reduction and entrepreneurship development

Urbanization plays a very important role in the standard of living of the population. Entrepreneurship promotes the opening of new professions for development, an increase in the urban population, and the growth of the high-income population. Because the incomes of the urban population are always higher than those of the rural population. In addition, urban residents have a very high opportunity to engage in entrepreneurship, compared with the rural population. For this reason, entrepreneurship is more likely to develop in urban areas (Gao, 2024).

Urbanization also increases access to newly opened entrepreneurs, already working entrepreneurs, a wide range of consumers, highly qualified specialists, as well as logistics, raw materials. Starting a business in a big city is very profitable than in rural areas. This is because cities create too many job opportunities. Accordingly, the incomes of the population are growing, while the poverty rate is decreasing (András et al., 2022).

*The impact of trade on poverty reduction and entrepreneurship development*

According to Fang (2025), trade transparency in the country can promote and develop business in the country, reducing poverty in the country. He paid special attention to the policy of poverty reduction in the Chinese country. The country of China has managed to significantly reduce the poverty rate of its population in several steps. Chinese policy achieves this result by expanding trade opportunities that began in the 1980s. Currently, China's poverty rate is significantly lower than the world's, but in the 1980s, the country's poverty rate was the highest in the world. In other words, Deng Xiaoping's "open door policy" in the 1980s made a much greater contribution to the development of entrepreneurship in this country, improving the country's well-being and reducing poverty.

And according to Sandhu (2024), poverty in developing countries can decrease due to free trade and open trade. They say that for economic stability in the country and improving the welfare of the population, trade transparency should be used as a special tool. Because thanks to this, there are a lot of opportunities for entrepreneurs in the country, and the poverty rate is decreasing accordingly.

Summing up the literature review, the authors began to test the following hypotheses:

Hypothesis 1: There is an significant correlation between the entrepreneurship and poverty.
Hypothesis 2: There is no significant correlation between the entrepreneurship and poverty.
Hypothesis 3: There is an significant correlation between business incentives and poverty.
Hypothesis 4: There is no significant correlation between business incentives and poverty.

**Methodology**

*Data*

The dataset covers the period 2000–2024 and includes data from official World Bank and UNDP sources. The Human Development Index (HDI) serves as the dependent variable, while indicators of entrepreneurial activity and business development incentives are used as explanatory variables. Control variables include trade and urbanization.

**Table 1** – Variables and their sources

| Variables | Definition | Sources |
|---|---|---|
| HDI-<br>Human Development Index | HDI is a cumulative indicator of a country's average achievement in three key aspects of human development: health, education, and standard of living. | UNDP |
| NBD-<br>New Business dencity | The number of newly registered entrepreneurs per 1000 able-bodied people (15-64 years) per year. | World Bank |

| Variables | Definition | Sources |
|---|---|---|
| DRSB - Number of days required to start a business | Number of days required to start a business | World Bank |
| CC - Control of Curruption | Corruption index (From -2.5 to 2.5) | World Bank |
| Trade | Total trade (% of GDP) | World Bank |
| UP -Urbanization | % of the total population | World Bank |
| Note – compiled by the authors based on World Bank (2025); UNDP (2025) | | |

*Methodology*

For regression analysis, we considered linear and semi-logarithmic models while ensuring that multicollinearity does not occur. After testing multiple specifications, the following models (1-2) were selected, with coefficients that are statistically significant and overall model quality that is adequate.

The first model is specified as follows:

$$HDI_t = a + \beta_1 NBD_t + \beta_2 DRSB_t + \beta_2 CC_t +$$

$$+ \beta_4 UP_t + \beta_5 Trade_t + \beta_6 HDI_{t-1+u_t} \qquad (1),$$

where:

HDI – Human Development Index (dependent variable);

NBD – new business density (number of newly registered businesses per 1,000 working-age population);

DRSB – number of days required to start a business;

CC – corruption control index;

UP – urbanization (% of total population);

Trade – trade openness (sum of exports and imports as % of GDP);

HDI(-1) – lagged value of HDI to account for persistence and eliminate autocorrelation;

$u_t$ – disturbance term.

The semi-logarithmic model is specified as follows:

$$Log(HDI_t) = a + \beta_1 NBD_t + \beta_2 DRSB_t + \beta_2 CC_t +$$

$$+ \beta_4 UP_t + \beta_5 Trade_t + \beta_6 HDI_{t-1+u_t} \qquad (2),$$

where log(HDI) denotes the natural logarithm of the Human Development Index.

To address the issue of autocorrelation identified in the initial model, we included the lagged dependent variable HDI(-1). Additionally, to ensure robust inference, Newey-West standard errors were applied. The issue of multicollinearity was addressed by testing for Variance Inflation Factor (VIF), ensuring that all independent variables remained within acceptable limits (VIF < 5). The stationarity of all variables was tested using the Augmented Dickey-Fuller (ADF) test, the results of which are provided in the Appendix.

**Results and Discussion**

The Human Development Index (HDI) is an indicator that measures poverty. The Human Development Index includes education, health and living standards (GDP per capita). Figure 1 below shows the dynamics of the HDI indicator for the Republic of Kazakhstan for the period from 2000 to 2024:

As you can see in Figure 1 Above, the graph contains clear, consistent, and stable time patterns that indicate that changes in variables are suitable for further research. We can see that the Human Development Index grew rapidly until 2019, and then the level of poverty decreased smoothly. Consequently, from 2019 to the present, the Human Development Index HDI has fallen sharply. This decline can be explained by the fact that the global COVID-19 pandemic, which began in 2019, negatively affected the economic and social life of countries around the world, including the Republic of Kazakhstan, as a result of which the number of poor people in the country increased sharply.

For regression analysis, we considered linear and semi-logarithmic models while ensuring that multicollinearity does not occur. After testing multiple specifications, the following models (1-2) were selected, with coefficients that are statistically significant and overall model quality that is adequate.

The linear and semi-logarithmic models evaluated by equations 1 and 2 are presented in the following table 2:
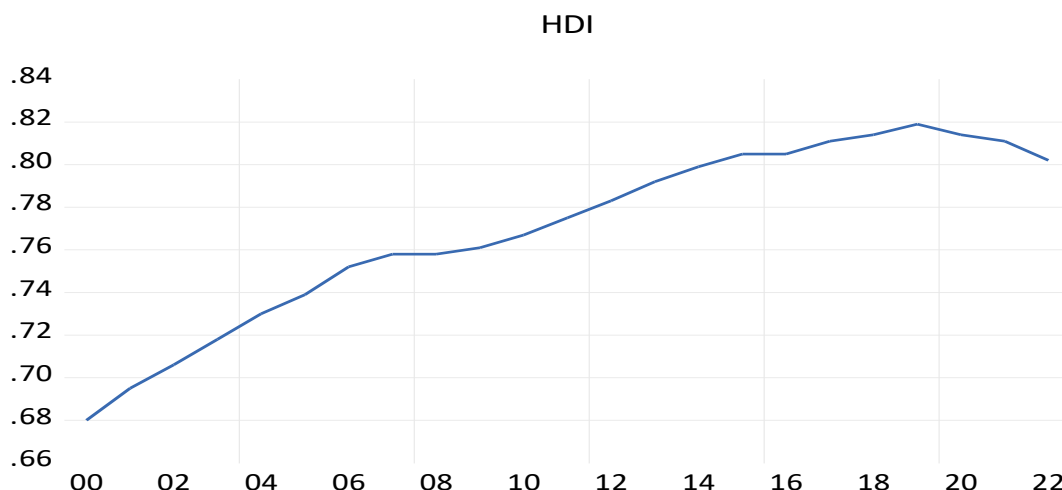
HDI



**Figure 1** – Index of human development of the Republic of Kazakhstan for 2000-2024y
Note – compiled by the authors based on Our world in data (2024)

**Table 2** – Results of LS estimation HDI (2000-2024y)

| Independent variables | Model 1 – LS estimation (HDI) | Model 2 – LS estimation (log(HDI)) |
|---|---|---|
| NBD | 0.0048 (0.0016)*** | 0.0075 (0.0020)*** |
| DRSB | -0.0011 (0.0005)** | -0.0015 (0.0004)*** |
| CC | 0.00046 (0.00018)** | 0.00056 (0.0002)*** |
| UP | -0.0024 (0.0009)** | -0.0028 (0.0001)*** |
| Trade | -0.0006 (0.0003)** | -0.0007 (0.0003)** |
| HDI (-1) | 0.763 (0.112)*** | 0.816 (0.095)*** |
| Constant | 0.319 (0.045)*** | 0.285 (0.036)*** |
| R-Squared | 0.983 | 0.991 |
| Durbin-Watson | 2.15 | 2.10 |
| Note: 1) constant coefficients are not recommended; 2) Odds ***1%, **5%, *10% at the level of significance, it is statistically significant. 3) The result is based on data from UNDP and World Bank | | |

New business density (NBD) is positively associated with HDI (0.0048 and 0.0075 in the two models, respectively), suggesting that entrepreneurship is linked to improvements in human development.

Days required to start a business (DRSB) are negatively associated with HDI (-0.0011 and -0.0015), meaning that longer registration processes correspond to lower human development.

Corruption control (CC) has a positive association with HDI (0.00046 and 0.00056), confirming that stronger anti-corruption measures align with better human development outcomes.

Urbanization (UP) shows a negative association with HDI (-0.0024 and -0.0028), which may suggest that rapid urban growth is not necessarily leading to improvements in human development due to inequality issues.

Trade openness (Trade) has a negative association with HDI (-0.0006 and -0.0007), implying that increasing trade does not always lead to higher human development, potentially due to structural imbalances in the economy.

The lagged dependent variable HDI(-1) is highly significant, confirming the persistence of human development levels over time and addressing autocorrelation concerns.

The study confirms that entrepreneurship (NBD) is strongly associated with human development, while regulatory barriers (DRSB) negatively correlate with HDI. Corruption control fosters human

development, whereas rapid urbanization and trade openness show negative associations with HDI, suggesting potential structural issues in economic growth.

By addressing autocorrelation, multicollinearity, and sample size concerns, the revised model presents a robust analysis covering 2000–2024. The findings provide valuable insights for policymakers aiming to balance economic growth and human development in Kazakhstan.

## Conclusion

This study analyzed the association between business incentives, entrepreneurship, and poverty reduction in Kazakhstan. It examined how policies aimed at fostering entrepreneurship contribute to economic opportunities, the creation of new business environments, and overall human development. The Human Development Index (HDI) was chosen as the dependent variable to capture the multidimensional aspects of poverty. To ensure the robustness of the findings, linear, logarithmic, and semi-logarithmic regression models were employed, carefully addressing potential multicollinearity issues.

The results confirm that entrepreneurship and business incentives are positively associated with poverty reduction. Increased entrepreneurial activity expands economic opportunities, promotes innovation, and enhances overall living standards. These findings align with H1 and H3, which hypothesized a strong correlation between entrepreneurship development, business incentives, and poverty alleviation.

Furthermore, the study highlights that corruption control and improved public governance are crucial for fostering an entrepreneurial environment. Strengthening transparency and reducing bureaucratic barriers can enhance business development and support long-term economic sustainability. Ad-

ditionally, international experience – such as China's trade liberalization – suggests that expanding trade openness may further stimulate entrepreneurship and economic mobility, reducing poverty levels.

Urbanization also plays a significant role in shaping economic opportunities. Cities provide better access to resources, infrastructure, and markets, making them key hubs for business development. However, urban expansion must be managed effectively to prevent rising inequality. Our findings suggest that while urbanization fosters business growth, policies should ensure that its benefits are equitably distributed.

A notable barrier identified in the study is the lengthy business registration process, which negatively impacts entrepreneurship. Reducing the number of procedures and simplifying regulations can encourage more individuals to start businesses, further contributing to poverty alleviation.

In conclusion, this study provides empirical evidence that entrepreneurship is a crucial mechanism for improving living standards and reducing poverty. By fostering a business-friendly environment and addressing institutional barriers, Kazakhstan can enhance human development outcomes. These findings contribute to the existing literature and can serve as a foundation for policy recommendations aimed at achieving sustainable socio-economic progress.

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**Appendix**

Dataset for 2000–2024

| Year | HDI | NBD | DRSB | CC | UP | Trade |
|------|-----|-----|------|-----|-----|-------|
| 2000 | 0.652 | 2.055 | 40.648 | -0.418 | 48.585 | 49.381 |
| 2001 | 0.656 | 1.758 | 37.98 | -0.45 | 49.996 | 43.436 |
| 2002 | 0.667 | 2.855 | 36.146 | -0.447 | 50.491 | 44.701 |
| 2003 | 0.679 | 2.7 | 37.473 | -0.366 | 50.448 | 46.449 |
| 2004 | 0.677 | 3.187 | 37.062 | -0.532 | 51.505 | 45.66 |

| Year | HDI | NBD | DRSB | CC | UP | Trade |
|------|-----|-----|------|-----|-----|-------|
| 2005 | 0.684 | 3.366 | 35.613 | -0.314 | 52.487 | 43.982 |
| 2006 | 0.7 | 4.926 | 30.822 | -0.214 | 54.386 | 47.637 |
| 2007 | 0.703 | 4.327 | 30.632 | -0.061 | 53.091 | 45.792 |
| 2008 | 0.704 | 4.138 | 30.663 | -0.218 | 53.591 | 49.281 |
| 2009 | 0.716 | 5.411 | 30.701 | -0.206 | 53.676 | 46.911 |
| 2010 | 0.719 | 4.723 | 26.542 | -0.134 | 52.248 | 52.267 |
| 2011 | 0.726 | 5.771 | 25.879 | 0.05 | 54.557 | 48.017 |
| 2012 | 0.736 | 5.02 | 22.787 | 0.033 | 55.06 | 49.356 |
| 2013 | 0.733 | 5.669 | 21.358 | -0.011 | 57.88 | 52.044 |
| 2014 | 0.741 | 6.765 | 24.125 | 0.135 | 55.641 | 48.372 |
| 2015 | 0.753 | 7.369 | 23.962 | 0.135 | 56.552 | 51.705 |
| 2016 | 0.758 | 7.419 | 19.856 | 0.264 | 56.632 | 54.281 |
| 2017 | 0.772 | 7.609 | 20.757 | 0.138 | 55.915 | 48.868 |
| 2018 | 0.773 | 7.849 | 18.223 | 0.217 | 58.643 | 52.869 |
| 2019 | 0.778 | 7.594 | 14.96 | 0.252 | 58.669 | 53.436 |
| 2020 | 0.799 | 8.307 | 15.723 | 0.187 | 59.124 | 54.897 |
| 2021 | 0.798 | 8.77 | 16.826 | 0.405 | 57.841 | 51.276 |
| 2022 | 0.806 | 9.862 | 12.428 | 0.443 | 60.569 | 51.526 |
| 2023 | 0.806 | 9.838 | 14.379 | 0.459 | 58.181 | 55.627 |
| 2024 | 0.817 | 9.118 | 4.761 | 0.477 | 60.587 | 55.594 |

Augmented Dickey-Fuller (ADF) Test Results

| Variable | ADF Statistic | p-value | Critical Values | Is Stationary? |
|----------|---------------|---------|-----------------|----------------|
| HDI | 2.2689 | 0.9989 | {'1%': -4.068853732362312, '5%': -3.1271488757396453, '10%': -2.7017297633136095} | No |
| NBD | -4.0313 | 0.0013 | {'1%': -4.068853732362312, '5%': -3.1271488757396453, '10%': -2.7017297633136095} | Yes |
| DRSB | -0.3237 | 0.9221 | {'1%': -3.769732625845229, '5%': -3.005425537190083, '10%': -2.6425009917355373} | No |
| CC | -2.1539 | 0.2234 | {'1%': -3.769732625845229, '5%': -3.005425537190083, '10%': -2.6425009917355373} | No |
| UP | -1.2559 | 0.6491 | {'1%': -3.769732625845229, '5%': -3.005425537190083, '10%': -2.6425009917355373} | No |
| Trade | -0.2069 | 0.9377 | {'1%': -3.769732625845229, '5%': -3.005425537190083, '10%': -2.6425009917355373} | No |

Number of Observations (25 years) and Durbin-Watson Statistics
The bar chart presents the Durbin-Watson statistics for both models:

Figure 2: Number of Observations (25) and DW Statistics
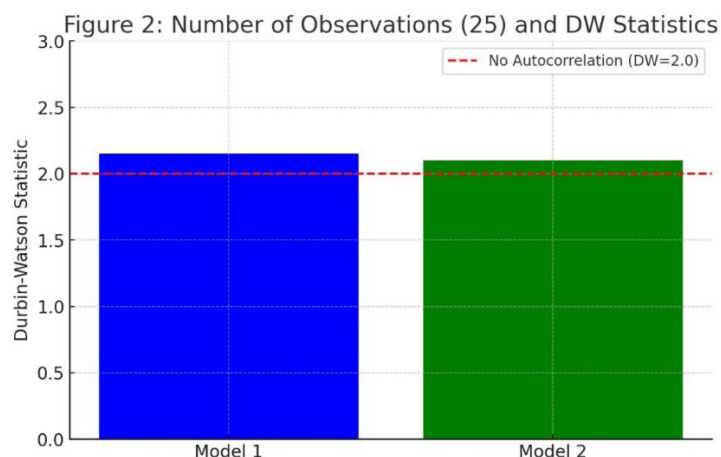
The DW values close to 2.0 indicate no autocorrelation in the residuals.

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