

# Exploring green loans: effects on household financial habits compared to conventional loans

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**Abstract.** Central Asian countries, such as Kazakhstan, are demonstrating their interest in protecting the environment and conserving natural resources by introducing ESG principles in the financial sector and supporting the global green economy course. The steady growth of household borrowing and increased attention to the environmental component at the state level prompted a study of the impact of income inequality (Gini index) on the use of renewable energy sources. According to the authors of the study, increasing inequality may lead to a decrease in public and political support for renewable energy policies. This idea formed the basis of the hypothesis and served as the purpose of the study. The hypothesis testing was based on secondary data from official sources using correlation and regression analysis. The results of the analysis showed a weak relationship between the two variables, which did not confirm the hypothesis of the study, indicating the need for further study of this issue with the coverage of Central Asian countries and the introduction of additional factors (energy prices, GDP per capita, unemployment rate and others) into the proposed model. The results of the study will serve as a basis for the development of further research on this topic for the countries of Central Asia due to its insufficient study.

## 1 Introduction

Green loans, a key component of green finance, have a significant long-term impact on household financial stability and sustainable development. Research shows that the implementation of green finance, such as green credit policies and green banking practices, can lead to lower loan default rates in banks, ultimately contributing to financial sustainability [1-2]. Green finance, including green loans, plays a crucial role in promoting environmental protection, sustainable development and investment in renewable energy, thereby improving overall financial stability and household resilience [3-5]. By encouraging the adoption of green practices and investments, green loans not only mitigate environmental impacts, but also support economic growth and stability in the long term, ensuring a more sustainable future for households and the economy as a whole.

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With ongoing climate change and growing awareness of the need to adopt sustainable practices, green loans are becoming an increasingly topical tool to encourage environmentally responsible behavior. However, traditional loans remain the main source of finance for households. This research aims to comparatively analyze green loans and traditional conventional loans in order to capitalize on their role in promoting sustainable practices and to understand the relationship between the two.

## 2 Materials review

In the global scientific community, research in the field of green finance is of interest due to the lack of disclosure of the concept of green finance and mechanisms for its implementation [6]. According to O. Miroshnichenko and N. Mostova. [7], the concept of “green” loans is still at the stage of development. Despite the existing theoretical problems, there is research that contributes to the understanding of the concept and considers green loans as an innovative tool for implementing sustainable economic development policy [8-9].

Green loans are designed to finance projects aimed at improving the environmental situation [10]. They are also considered as a tool for green finance [7], which aims to achieve a balance between economic growth and environmental conservation [11, 12]. Thus, green loans are a mechanism for implementing green finance policies to promote sustainable development while protecting the environment.

The key difference between green loans and traditional loans is that they focus on promoting sustainable growth for borrowers committed to preserving the environment and natural resources. The features of green loans include [13]:

- financing projects that promote environmental protection,
- compliance with certain standards and classifications,
- use of funds exclusively for environmental purposes,
- regular reporting on the environmental impact of financed projects,
- lower interest rates or longer loan repayment periods,
- increased awareness of environmental issues increases attention to green loans,
- alignment with Sustainable Development Goals.

Considering the principles of green loans in the context of Central Asian banking systems is important due to the lack of research in the region. An interesting issue is the perception of this concept by households in Central Asia, given their socio-economic characteristics. In addition, it is crucial to study how green loans contribute to risk mitigation in the financial sector [2].

Paul [14] emphasizes that green loans significantly influence household behavior by increasing interest in environmentally friendly practices. The combination of behavioral and non-behavioral interventions significantly increases the effectiveness of household actions to level climate change. In addition, research in the green energy sector shows that presenting renewable energy as a standard option receives widespread support among households, indicating the potential for non-financial incentives to encourage environmentally responsible behavior [15].

Several research studies investigated the significant impact of green loans on household behavior in terms of making sustainable and environmentally conscious decisions [16-18]. Thus, despite the research results demonstrating the significant impact of green loans on household behavior, the development and implementation of policies using green economy principles, potential barriers to their implementation in Central Asian countries and the need for in-depth studies to reduce the risks associated with green loans require further studying.

### 3 Research methods

Increasing inequality may lead to a decrease in public and political support for policies aimed at developing renewable energy. This idea formed the basis of the hypothesis: “Income inequality (Ginny index) has a negative effect on renewable energy utilization”.

MS Excel was used to test the hypothesis. The analysis was based on secondary data from the Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan with correlation and regression analysis.

Dependent variable - the share of electricity produced by renewable energy sources (RES) in the total volume of electricity produced (in percent). The independent variable is the income concentration ratio (Gini index). Due to limited environmental data, the analysis was conducted for the period from 2013 to 2022.

The data on the share of electricity produced by RES in the total electricity generated (%) and the income concentration factor (Gini) are presented in Table 1.

**Table 1.** Statistical data for hypothesis testing.

Period	Income concentration ratio (Gini index)	Share of electricity generated by RES in the total volume of electricity generated, %
2013	0.276	8.1
2014	0.278	8.7
2015	0.278	10.3
2016	0.278	12.7
2017	0.287	11.3
2018	0.289	10.2
2019	0.290	10.4
2020	0.291	11
2021	0.294	10.9
2022	0.285	11.8

Source: Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan

### 4 Results

According to the results analysis, the correlation coefficient is 0.33, which indicates a moderate positive correlation between the Gini index and the share of renewable energy. This means that as the Gin index increases, the share of renewable energy also tends to increase. The correlation between the variables is not strong enough and the hypothesis that higher income inequality has a negative effect on the use of renewable energy is not confirmed.

Additionally, regression analysis was performed to confirm or reject the hypothesis, and the test data are summarized below (Table 2-4).

**Table 2.** Regression analysis.

Multiple R	0.33346953
R-squared	0.111201927
Normalized R-squared	0.000102168
Standard error	0.006568953
Observations	10

**Table 3.** Analysis of variance.

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>F Value</i>
Regression	1	4.31908E-05	4.31908E-05	1.000919607	0.346384294
Excess	8	0.000345209	4.31511E-05		
Total	9	0.0003884			

**Table 4.** Results of regression analysis. Test data

	Coefficients	Standard error	t-statistics	P-value	Bottom 95%	The top 95%	Bottom 95,0%	The top 95,0%
Y-intersection	0.2676	0.0171	15.6820	2.72856E-07	0.22829	0.30701	0.22829	0.30701
Variable X 1	0.0016	0.0016	1.0005	0.34638	-0.00209	0.00531	-0.00210	0.00531

*Gini index coefficient (0.001607998)*. The small positive coefficient indicates a slight increase in the share of renewable energy with increasing Gini index. However, given the high p-value (0.346384294) and confidence interval including zero, this relationship is not statistically significant.

The p-value of Gini index (0.346) is greater than 0.05, indicating that the coefficient of Gini index is not statistically significant at 5% significance level. There is insufficient evidence that the Gini index significantly affects the share of renewable energy sources [19-30].

## 5 Discussion

Based on the regression analysis, there is no significant evidence that the Gini index affects the share of renewable energy. The difference is significant, indicating a baseline level of renewable energy share that is independent of the Gini index. Other factors may have an impact on the share of renewable energy, which is subject to further research.

Further work on improving financial literacy of the population remains relevant [19], which is also evidenced by the data of the financial market regulator. In particular, there is a stable trend of growth in the volume of loans to households. According to the data of the Agency of the Republic of Kazakhstan on Regulation and Development of the Financial Market, loans to individuals as of 01.06.2024 increased from the beginning of the year by 7.7 %, amounting to KZT 17,985.9 billion with a share of 57.6% of the loan portfolio (at

the beginning of 2024 - KZT 16,698.2 billion or 55.9% of the loan portfolio). Consumer loans for the period under review increased from KZT 10,312.7 billion to KZT 11,282.7 billion, which is 9.4% growth. At the same time, the growth of overdue loans with overdue debt from 1 to 30 days by 47%, from 31 to 60 days by 41.5%, from 61 to 90 days - 41.9%, over 90 days - 24.6% is a cause for concern. Due to the observed stable dynamics of growth of loans by households, the financial market regulator decided to strengthen behavioral supervision of borrowers.

According to the authors of the research, the growth of household lending is dictated by a number of factors, such as reduced requirements to borrowers, on the one hand, and, on the other hand, socio-economic factors that push to cover the gap in the family budget with a loan. According to the Bureau of National Statistics of Kazakhstan, the reasons for the low and below average level of households' provision, respondents noted more often: low wages (92.7 %), low pension (1.4%) and the lack of any paid work (0.9%).

With regard to the environment, the authors of this research note, according to the official statistical data of the Bureau of National Statistics of Kazakhstan, an increase in the amount of environmental protection costs. In the structure of costs by 15.2 % increased costs for air protection and climate change problems, costs for wastewater treatment increased by 74 %, for waste management increased by 62.5%. Simultaneously with the above mentioned acts, the attention to the introduction of ESG principles in the financial sector, "green" financing, "green" bonds is increasing [31-58].

## 6 Conclusions

The research suggests that green loans are a mechanism for implementing green finance policies to promote sustainable development while protecting the environment. The key difference between green loans and traditional loans is that they focus on promoting sustainable growth of borrowers committed to preserving the environment and natural resources.

Based on the data obtained, the hypothesis is not confirmed. A weak relationship has been established between the variables. To further develop the research topic, it is recommended that consideration be given to the possibility of including additional variables that would make it possible to provide a more extensive explanation for the share of renewable energy such as GDP per capita, government policies, energy prices and technological advances.

Despite research results demonstrating the significant impact of green loans on household behavior, the development and implementation of policies using green economy principles, potential barriers to their implementation in Central Asian countries, and the need for in-depth research to mitigate the risks associated with green loans require further studying.

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