

Gender Stereotypes and Green Banking Toward Carbon-Free Economy

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Abstract

The concept of modern world ideology accepts that sustainable development goals couldn't be achieved without green restructure and gender equality. That is the base of the new green economy focused on the social welfare of living and future generations due to increasing the eco-efficiency. This paper summarizes the arguments and counterarguments within the scientific discussion on gender stereotypes in society and green banking. Systematization of scientific sources and approaches concerning the investigated issues showed that only several international financial funds and organizations established in response to climate change focus on the gender aspects towards empowering women with more opportunities to participate in green projects. The primary purpose of the research is to determine how finance and gender determinants influence the carbon-free economic transformation. To gain the research goal, this study applied the modified Cobb-Douglas function that utilizes cross-sectional data on green finance and gender determinants. The methodological tool of this research is the method of least squares. The research object is Ukraine and the Visegrad countries (Poland, Slovak Republic, Czech Republic, and Hungary). The empirical results showed that the women employed in services, GDP, the share of female population, and level of female unemployment have statistically significant impacts on carbon-free economic development. In contrast, foreign direct investment and women in national parliaments are insignificant. Therefore, the research empirically confirmed and theoretically proved that gender equality impacts carbon-free economic development. The main research limitation is the lack of open-access data to monitor the green financial activity under gender equality consideration.

Keywords: green energy transformation, gender equality, financial organizations, sustainable development, carbon-neutrality

JEL Classification: M31, M37, M38, G21, J16.

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Introduction

The modern world has faced the threat of snowballing growth of surface temperature resulting in adverse climate change. Figure 1 demonstrates that in 2018, the annual world temperature increased by 0.84 points since 1991, while in Ukraine – by 1.91 times. However, it stands to mention that an appreciable decrease in temperature was in 2009 that could result from the economy slowing down after the global financial crisis. Having regard to several studies (Us et al., 2020; Chygryn and Scherbak, 2011) devoted to climate change, the scientists stated that the average temperature in the world would increase by above three degrees Celsius until 2100 if no radical measures towards reducing carbon emissions were adopted (Bilan et al., 2020). In turn, the carbon emission growth would aggravate the extreme weather conditions and change the climate situation on the regional levels. Despite the absence of accurate scenarios of evolving climate changes in different world regions, climate change would affect the vulnerable firstly. Therefore, there is an urgent need to create a carbon-free economy under the sustainable development goals (SDGs) announced in 2012 at the UN Conference on Sustainable Development in Rio de Janeiro (Akhundova et al., 2020; Pimonenko et al., 2017). Indeed, the world community agrees that sustainable development can be achieved only if the economic, social, and ecological targets are considered to be interrelated. Besides, it is believed the issues of gender equality have a decisive role since the human could accelerate or slow down upon the achievement of SDGs. Therefore, gender equality and carbon-free development are inextricably connected.

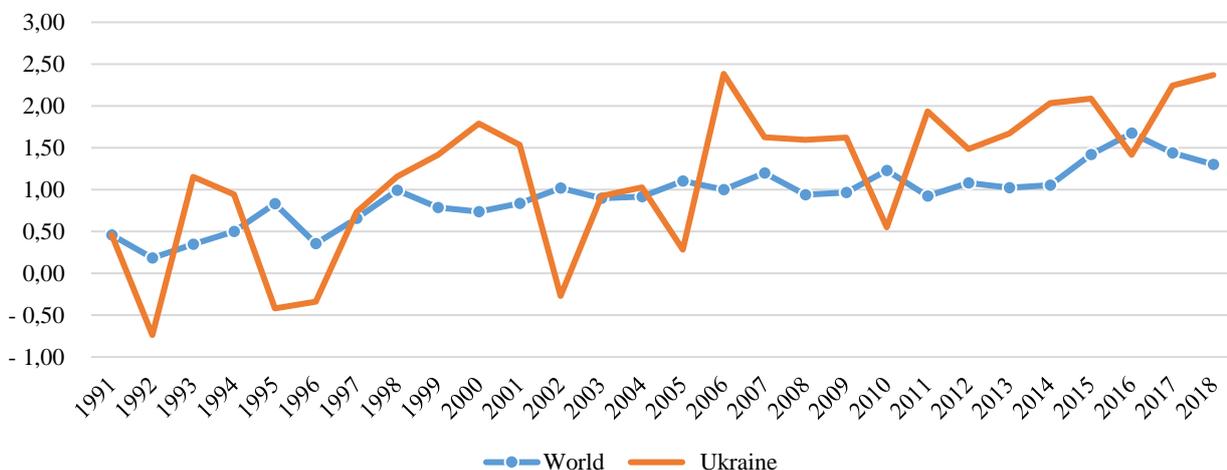


Figure 1. Annual surface temperature changes, 1991-2018

Sources: compiled by the authors based on (OECD.Stat, 2021).

The systematization of scientific sources indicated that the term "gender" refers to the social pattern of feminine and masculine essence (Pimonenko et al., 2020; Lyeonov et al., 2021; Hussain et al., 2020). Gender means more than biological differences between women and men. It includes methods for assessing and applying the real or imagined sex differences to classify women and men and assign them social roles. Therefore, the women's and men's life and their interaction with the financial system are carried out within the framework of a complex set of social and cultural expectations and stereotypes.

Gender stereotypes are the simplified, conceptualized, and emotion-laden established women and men images applied to a particular community. It is believed that gender stereotypes provoke gender inequality and affect social development.

Generally, women are more intended to follow the principles of sustainable development as a way of living (Pimonenko et al., 2018; Kolosok et al., 2020). They are more aware of environmental aspects and active in environment-oriented actions. Besides, women consume more organic food and consume fewer foods of animal origin (especially meat), use public transport, etc. Indeed, many factors (including income and social status of women, etc.) influence the female choice to behave pro-environmentally. However, the most critical factors are the reproduction function and their expectation of how their choice affects the family's long-term welfare (Johnsson-Latham, 2007).

On the other hand, women are ready to change their lifestyles and make decisions intuitively, while men use technology. Women spend more time increasing their awareness of sustainable consumption and healthy

lifestyle. They buy more products and prefer environmentally-friendly products, while men buy less, but it is expensive and prestigious products (such as cars, electronics, real estate, etc.).

Following the above, gender equality is considered to be one of the most critical aspects of labor market development because it ensures fair competition between both sexes, increases the economic potential and taxable base, etc. Recently, civil society has been drawing more attention from the international financial organizations (IFOs) to gender issues since gender equality is a precondition for sustainable development and fighting against poverty. Following gender equality is one of the UN Sustainable Development adopted in 2015 (SDG, 2021). If women occupy the central positions in the economy would contribute to achieving better and more sustainable results in global sustainable development. Herewith, gender gap reduction contributes to developing a stable and flexible banking system, accelerating economic growth, and enhancing the efficiency of monetary and fiscal policies (Mursalov, 2020; Dubina et al., 2020).

Therefore, the intentions to reduce gender inequality require financial aid and credit for transition to the new gender-equal model. It stands to mention that IFOs have developed policies and strategies for fighting against gender inequality and increasing women's potential in developing countries. IFOs and International Funds finance countries in cross purposes. However, a priority is the programs and projects concerning improving living conditions and climate change.

Despite the above, the IFOs' financial aid may still have a negative impact on financially disadvantaged women. Women could be victims of the neoliberal reforms (s.a., trade liberalization, state privatization, reduction of spending on safety-net programs, financial reforms, etc.). On frequent occasions, women are the first who lose jobs, suffer from bad (or absence of) medical services and education. In addition, most women have to stop working to take care of family and children.

Sometimes it is possible to identify gender issues in the early project stages. Conversely, it could require careful study of the project documentation to understand the likely results, prevent negative impacts and stimulate a turn for the better. Note that any project with environmental and socio-economic implications also has gender implications, which can be very serious if not adequately addressed early in the project.

The international practice shows that green projects addressing the gender aspects are part of IFO's environmental and social policy (Chygryn, 2017; Pimonenko et al., 2019b). For instance, in the Environmental and Social policy of the European Bank for Reconstruction and Development (EBRD), the social aspects of green projects cover the labor standards and working conditions (s.a., occupational health, and safety), impact on the society (including public health and safety, gender equality, heritage, violent uprooting, etc.), and access to essential services. The above involves the Departments on the environmental issues and sustainable development to ensure the mitigation of gender impact (ESP, 2014). The social and ecological policy requires changes in the mechanisms and principles of management to consider the negative consequences in the context of gender aspects and gender-based discrimination among the employees and society under the EU requirements.

The EU legislation considers gender equality as the critical aspect to ensure and protect fundamental human rights. It stands to mention that general instruments for ensuring gender equality are provisions of the Agreements and Directives concerning employment assistance, wage equality, rights of expectant mothers, social welfare, self-employment, etc. However, despite the EU being an active promoter of infrastructure projects, relatively little money is allocated to dealing with environmental issues and gender equality outside the EU.

On the other hand, the environmental and social principles and standards of the European Investment Bank (EIB) include the labor standards providing the equal treatment and opportunities for all people despite the nationalities, religion, originality, sexes, gender identity, political commitments, age, etc. Even though EIB follows the EU legislation on anti-discrimination and protects minority rights, it doesn't determine the specific ways in eliminating gender inequalities. In turn, to ensure gender integration, it is recommended to use different tools (including gender-based assessment, beneficiary assessment, etc.) to determine the necessary budget support to address the gender-based challenges (UN, 2021). The governments should integrate the gender aspects into their national strategy to provide budget support (Palienko et al., 2017; Pimonenko et al., 2019a).

The study (Gunther and Grimm, 2020) stated that increasing the level of educated and employed women, expanding their economic and political rights are some of the most perspective strategies to mitigate and overcome climate changes under economic growth. Thus, women are considered to be the main drivers of

sustainable development. The evidence showed that the countries with a low gender gap in education and employment access have better economic growth indicators. The above allows assuming that the complex approach to economic carbon-free development requires more investments towards overcoming gender inequality and providing more opportunities for their development.

Therefore, this study determines the impact of green financing and gender factors on carbon emission in the Visegrad countries and Ukraine.

Literature Review

The scientific background analysis showed that perception of gender value in the public environmental and economic awareness has begun from the 90th of the previous century (Figure 2). The scientists acknowledged that gender issues have an essential value in the relationship between economic development and ecology. Besides, Figure 2 shows that signing the Paris climate agreement in 2015 and declaring the European Green Deal were powerful triggers for scientists to provide in-depth analysis in the triangle economy-ecology-gender.

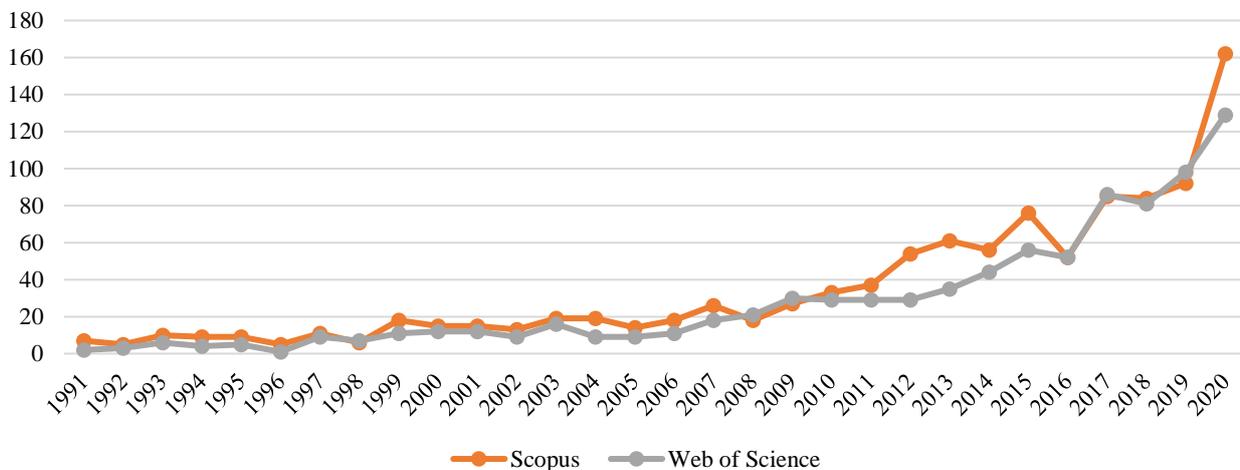


Figure 2. Dynamic of publication activity addressed the relationships in gender, ecology, and economy 1991-2020

Sources: compiled by the authors based on (Scopus, 2021; Web of Science, 2021).

The systematization of scientific sources showed that the linkages between the gender gap, carbon-free development, and green banking had been hardly investigated. At the same time, Prügl (2016) noted that the World Bank is the leading international driver in solving gender problems towards sustainable development. Then, Kelly (2020) considered the World Bank's strategy 2000-2023 and its partner's women's empowerment program named Hindustan Unilever concerning women empowerment under environmental footprint. The researcher highlighted the feminism contributions to sustainable development.

Mohapatra and Sahoo (2016) devoted their study to determining the role of microfinance programs in female environmental behavior. The scholars decided that microfinance participation empowers women and allows improving the social status of women. As a result, it increases women's engagement in green projects and provokes their interest in green products. On the other hand, the experimental research by De Medeiros et al. (2016) showed that the perceived value of green products and ecological appeal increases willingness to pay, on average, 10% more.

Bektur and Arzova (2020) highlighted the necessity to investigate more profound the linkage between the share of women on the board of directors and company performance. The authors analyzed how integrated reporting (including the ecological, financial, social, etc. indicators) contributes to the company's sustainability. Besides, special attention was paid to the influence of gender diversity on the company's board of directors on the integrated reporting and company progress.

Nyantakyi-Frimpong (2019) indicated that the gender gap and male domination in agriculture prevent sustainable development since it disreputes the local seeds banks. In the study (Sebestyén, 2019), the scientists applied the network-based model for the World Bank data to estimate the relationships among the social, economic, environmental, economic, and ecological issues. The authors found that intentions towards gaining

SDG No.5 accelerate economic development and contribute to green growth.

Ergas et al. (2021) involved data for 1995-2013 to determine the impact of gender equality on the ecological efficiency of 70 nations. Based on the findings of a series of Prais-Winsten regression models, the authors determined that the bigger share of women in the parliament and women's education reduce the carbon intensity of well-being.

Based on the theoretical findings, Maleta (2018) and Hanaček et al. (2020) highly recommended intensifying the scientific investigations towards analyzing the women's impact on ecological performance by increasing the scholarships for feminists worldwide.

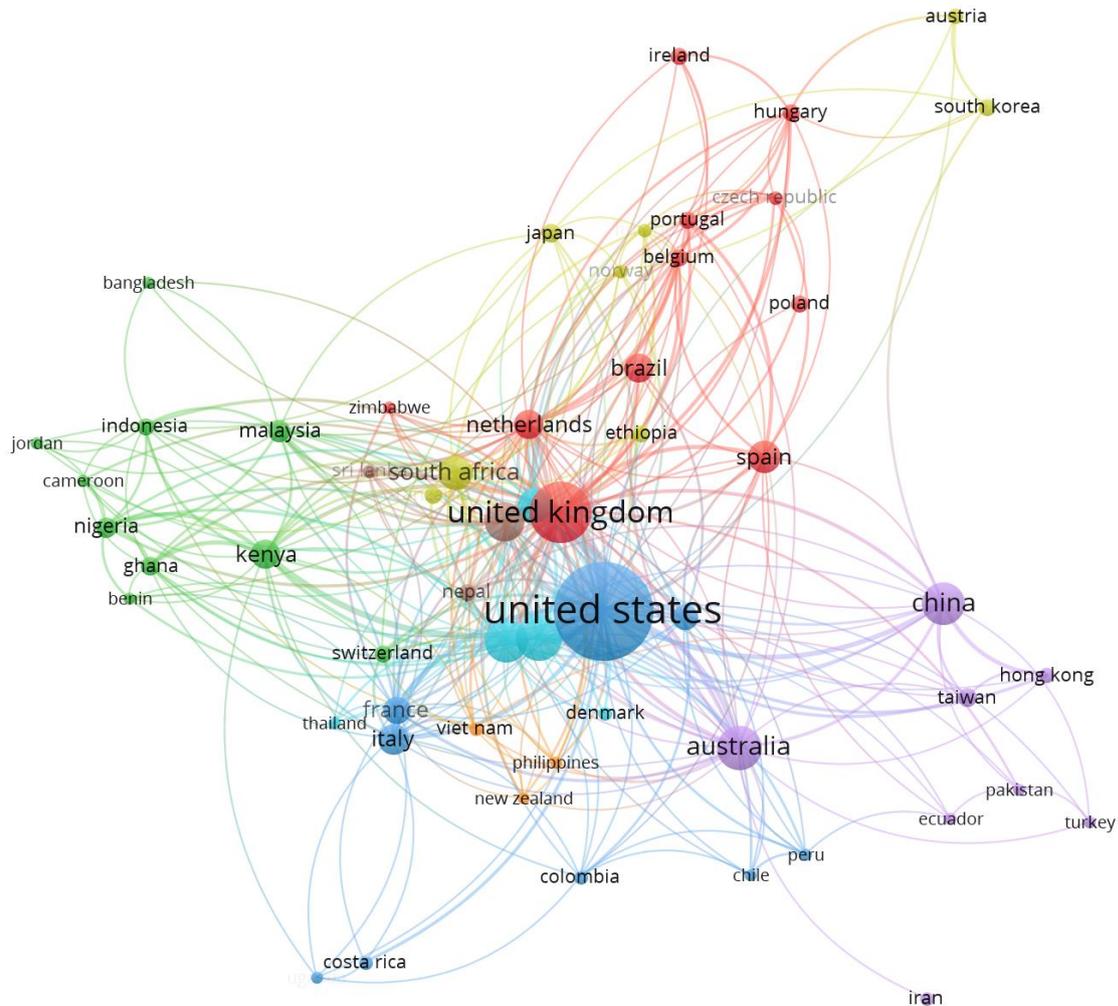


Figure 3. The network map on the countries contributions concerning the research topic, 2000-2020

Sources: compiled by the authors based on (Scopus, 2021).

The findings on bibliometric analysis through the method of visualizing similarities indicated that the top-5 productive countries were the USA, United Kingdom, Germany, Sweden, and Canada. On the other hand, Figure 3 visualizes eight clusters of co-authorship worldwide. Thus, the biggest (red) cluster shows the close co-authorship between the scientists from the EU (Belgium, Czech Republic, Hungary, Poland, Portugal, Spain, Netherlands), Brazil, Ireland, United Kingdom, and Zimbabwe. The second cluster (green) mainly combines the researchers from African countries such as Ghana, Kenya, Nigeria, Switzerland, Malaysia, Bangladesh. The third cluster (blue) is formed with the South American countries (including Chile, Colombia, Costa Rica, Mexico, Peru), the USA, France, and Italy. The fourth cluster (yellow) shows the tight work between South Africa, South Korea, Japan, Norway, Finland, and Austria researchers. The fifth cluster (purple) indicates the co-authorship among the scientists from China, Hong Kong, Taiwan, Turkey, Pakistan, Iran, Ecuador, and Australia.

Methodology and research methods

The core research hypothesis is:

H1: Green financing and gender equality positively influence carbon emission.

To check the above hypothesis on the contribution of green finance and gender equality to carbon-free economic development, this study applied the Cobb-Douglas production function (Lyulyov et al., 2021). Sadiq et al. (2021) used the modified Cobb-Douglas production function to estimate the influence of green finance on sustainable achievements, while Zhang et al. (2021) investigated the impact of investments on economic growth. Yamaguchi (2019) confirmed that female empowerment positively influences the macroeconomic situation in OECD countries.

Therefore, this study involved the two-factor modified Cobb-Douglas function (1) that utilizes cross-sectional data on green finance and gender:

$$CO_2 = f(FEP; GDP; FDI; FES; WNP; FUN; FEL), \quad (1)$$

The research objects are the Visegrad countries (Czech Republic, Slovak Republic, Hungary, and Poland) and Ukraine. Data were retrieved from the World Data Bank (GDP per capita, foreign direct investment (net inflows), employment in services, female, the proportion of seats held by women in national parliaments, unemployment (female), female labor force, and Our World In Data database (Population (female) and annual CO₂ emissions) for 2000-2019.

Table 1. Variables interpretations

Source	Variables	Denotation	Unit
Our World In Data	Annual CO ₂ emissions	CO ₂	tonnes per capita
	Female population	FEP	% of total population
World Data Bank	GDP per capita	GDP	current US\$
	Foreign direct investment, net inflows	FDI	BoP, current US\$
	Employment in services, female	FES	% of female employment
	Proportion of seats held by women in national parliaments	WNP	%
	Unemployment, female	FUN	% of female labor force
	Female labor force	FEL	% of total labor force

Source: compiled by the authors based on (World Bank Open Data, 2021; Our World In Data, 2021).

All data were linearized by taking logarithm to use for the least square method. Table 2 presents the descriptive statistic of all data conducted using the EViews12SV software tools.

Table 2. The descriptive statistic of the analyzed variables

	CO ₂	FDI	FEL	FEM	FES	FUN	GDP	WNP
Mean	1,998	22,502	2,674	3,952	4,46	2,157	9,088	2,674
Median	1,974	22,461	2,793	3,942	4,478	2,115	9,446	2,793
Maximum	2,527	25,247	3,357	3,986	4,561	3,029	10,064	3,357
Minimum	1,492	19,71	1,674	3,928	4,307	0,867	6,455	1,674
Std. Dev.	0,274	1,115	0,415	0,018	0,062	0,462	0,842	0,041
Skewness	0,219	-0,107	-0,468	0,686	-0,641	-0,139	-1,207	-0,468
Kurtosis	2,223	3,307	2,233	2,135	2,442	2,958	3,775	2,233
Jarque-Bera	3,268	0,585	6,111	10,96	8,149	0,331	26,796	6,111
Probability	0,195	0,747	0,047	0,004	0,017	0,847	0,000	0,047
Sum	199,839	2250,335	267,403	395,208	446,005	215,665	908,82	267,403
Sum Sq. Dev.	7,422	123,171	17,064	0,03	0,376	21,167	70,223	17,064
Observations	100	100	100	100	100	100	100	100

Source: compiled by the authors.

Results

To check the stationarity of the analyzed variable, the Panel Unit Root Test was applied. In the panel contest, the analysis was conducted through the panel unit root tests such as Levin, Lin & Chu; Im, Pesaran and Shin W-stat; ADF-Fisher Chi-square; PP-Fisher Chi-square. Table 3 demonstrates the only FDI and GDP variables are stationary.

Table 3. The stationarity analysis of the analyzed variables by panel unit root tests in level

Tests	Statistic Param.	Variables						
		Unit root in level						
		CO2	FDI	FEL	FEM	FES	FUN	GDP
Levin, Lin & Chu	Statistics	0,275	-1,735	0,796	-9,569	-2,189	0,596	-5,255
	Probab.	0,609	0,041	0,787	0,000	0,014	0,724	0,000
Im, Pesaran and Shin W-stat	Statistics	0,953	-2,27	0,193	-9,130	0,234	1,152	-2,978
	Probab.	0,829	0,01	0,577	0,000	0,592	0,875	0,001
ADF-Fisher Chi-square	Statistics	7,496	21,365	13,406	79,995	7,079	6,764	26,641
	Probab.	0,678	0,019	0,202	0,000	0,718	0,748	0,003
PP-Fisher Chi-square	Statistics	4,531	35,660	13,985	6,545	12,270	4,874	46,987
	Probab.	0,92	0,000	0,174	0,768	0,267	0,899	0,000

Source: compiled by the authors.

Based on the above, the Panel Unit Root Test was applied in the 1st difference. The obtained results stated that CO2, FEL, FEM, FES, and FUN are stationary in the 1st difference (Table 4).

Table 4. The stationarity analysis of the analyzed variables by panel unit root tests in 1st difference

Tests	Statistic Param.	Variables						
		Unit root in level						
		CO2	FDI	FEL	FEM	FES	FUN	GDP
Levin, Lin & Chu	Statistics	-3,019	-5,357	-2,483	-7,009	-4,817	-2,266	-3,926
	Probab.	0,001	0,000	0,006	0,000	0,000	0,011	0,000
Im, Pesaran and Shin W-stat	Statistics	-3,107	-5,457	-4,557	-6,828	-4,886	-1,752	-2,461
	Probab.	0,000	0,000	0,000	0,000	0,000	0,03	0,00
ADF-Fisher Chi-square	Statistics	27,324	46,646	39,467	58,39	42,081	18,173	22,235
	Probab.	0,002	0,000	0,000	0,000	0,000	0,05	0,007
PP-Fisher Chi-square	Statistics	46,904	46,646	92,166	11,355	72,227	22,067	25,913
	Probab.	0,000	0,000	0,000	0,331	0,000	0,015	0,004

Source: compiled by the authors.

Table 5. The findings of least square methods

Variable	Coefficient	Standard Error	t-statistic	Probability
FES	-0,69	0,362	-1,907	0,059
FDI	0,029	0,019	1,536	0,128
GDP	-0,205	0,004	-4,652	0,000
FEM	-17,754	1,023	-9,232	0,000
WNP	0,027	0,072	0,372	0,711
FUN	-0,109	0,004	-2,696	0,008

Source: compiled by the authors.

Table 5 shows that women employed in services, GDP, the share of female population, and level of female unemployment are statistically significant. Thus, the growth of the share of females employed in services decreases the CO2 by 0.69 units, GDP – 0,205 items, the share of the female population – 17,754, and female unemployment – 0,109. On the other hand, the findings showed that the impact of foreign direct investment and women in national parliaments are insignificant. Therefore, the obtained results concluded that gender equality contributes to green economic transformation, especially reducing carbon emission from economic activity.

Conclusions

These research findings showed that many different international financial funds and organizations were established in response to climate change. However, only several of them focus on the gender aspects towards empowering women with more opportunities to participate in green projects. Furthermore, the results showed that green financing has an insignificant impact on carbon-free development, while the role of women is essential. Therefore, it allows suggesting the necessity to increase the share of women in the green finance sphere to accelerate carbon-free growth. To gain that, it is appropriate to consider gender equality as a guiding principle and goal in the establishment and operation of green funds; elaborate on the gender-sensitive budgeting regulations; support staff training in gender issues; include gender indicators to regulate financial disposition; conduct regular gender audits of all green fund allocations; ensuring the participation of women

as stakeholders and beneficiaries at all stages of green project implementation; developing best practices with social, gender and environmental safeguards under conventions on human and women's rights, labor standards, and environmental law; dispel the common gender stereotypes concerning the unprivileged female role in society, etc. In turn, strengthening the gender role in green financing would improve the structure, system, and functional mechanisms of green investing. As a result, the above measures would increase women's green involvement and ensure gender equality in getting financial resources to implement eco-friendly activities towards developing a carbon-free economy.

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