GREEN INVESTING FOR SDGS: EU EXPERIENCE FOR DEVELOPING COUNTRIES

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ABSTRACT
The paper devoted to the analysis of the main principals of green investments as the alternative recourse to finance the achievement of the Sustainable Developments Goals 2030. Besides, the obtained result of the analysis of green investments dynamic proved the snowballing effect of green finance market developing in the world. The results of analysed showed: that emerging and developed countries influence on climate with different power; had unequal financial potential to achieve Sustainable Development Goals. In the paper, the authors tried to check hypotheses: linking between the country's contribution to the international commitment on climate-related expending, the volume of climate finance (as a type of green investments) and the country's rating on the Sustainable Development Index. The objects of the investigation were European and developing countries in the period 2015-2017 years. Under this research, the authors used the dataset from World Data Bank, Eurostat, Reports of OECD, European Investment Bank, Climate Bonds Initiative, Sustainable Development Index. The findings showed the correlation between the volume of green investments (for two types: international commitment on climate-related expending, the volume of climate finance) and country's efficiency on the way to achieve the SDGs 2030. Thus, the country with the higher volume of green investments occupied the higher position on the Sustainable Development Index. On the basis of the findings and results of the analysis of the EU experience, the authors allocated the most attractive direction to develop green investments market for emerging countries.
Keywords: investments, green economy, expenditure, green bonds

1. INTRODUCTION
All world leader countries have already accepted and started to implement activities for achieving the Sustainable Developments Goals 2030 (SDGs 2030). Noticed, that the SDGs 2030 is a logical continuation of "Millennium Declaration" for 200–2015 years. So, new action plan consists of 17 goals (comparison with previous 8 goals) and 169 tasks which contribute the huge financial recourses and supporting. Thus, in most countries especially developing countries, this process isn't so quickly as the community and the experts wished. Firstly, it is connected with the lack of financing. The developing countries don't have a sufficient volume of financing and they have to attract additional financial resources which are corresponding to the ongoing features of market economy functioning. So, in this case, is necessary to analyse the modern financial resources which could be directed for achieving the SDGs goals.

2. LITERATURE REVIEWER

The results of the EU and the USA experience the most effective way to attract additional financing to the green goals implementation is to develop and to activate the green investment market. Thus, (Chan et al., 2018) proved that green investment is a catalyst promoting of a clean environment for future generation. In this direction, the first steps have already been done by the EU countries. Thus, they accepted the "Action Plan: Financing Sustainable Growth" (European, 2018) which are explained the finance strategy for the EU counties in the framework of achieving the indicated SDGs 2030. Noticed, that the experts suggested that existence is not enough for achieving SDGs 2030. According to the "Action Plan: Financing Sustainable Growth" annual financial gap between existence and necessary green investment is 180 billion EUR. From the other side, the experts from European investment bank estimated such gaps as 270 billion EUR. Thus, the boosting of green investment market is actually at the ongoing level of economic development. It should be highlighted, that the main restrict factors of green investment market is a misunderstanding among investors what is mean green investment and green activities. Besides, the main principles, calcification, universal account system haven't been developed yet. According to the "Action Plan: Financing Sustainable Growth" the experts defined green investment as a sustainable investment and supposed that they relate on sustainable activities (from energy efficient project to the education activities on green growth). According to the EU declaration Sustainable finance consists of a strong green finance component that aims to support economic growth while:

- decreasing negative impact on the environment;
- decreasing greenhouse gas emissions and the volume of pollution;
- minimising waste and increasing efficiency of natural resources using (Sustainable, 2018).

The similar assumption made the scientists from Cambridge Institute for Sustainability Leadership indicating that green investment is a capital which invests in 'green' assets (the funds, the companies, the infrastructures, the projects and etc.) for solving environmental problems. Walter Kahlenborn (2018) indicated that no clear-cut definition of green investment and understandable selection criteria of green assets remain the developing of the green investment market. The authors in the paper (Martinez-Oviedo, Medda, 2018) also made the conclusion that it is no standard definition of green investment and green assets which remain the developing of the green investment market. In their paper, the scientists Martinez-Oviedo and Medda defined green investment as follows: capital which invests in low carbon and climate resilient initiatives, clean technologies, renewable energy, or natural capital that can be considered environmentally beneficial (Martinez-Oviedo, Medda, 2018). The scientists in the paper (Adeel-Farooq et al., 2018) allocated the greenfield investment and associated it with the capital which finances the green projects. The authors Eyraud L., Clements B., Wane A., Martin P. and Moser D. in the papers (Eyraud et al., 2013; Martin, Moser, 2016) analysed green investment as the investment which direct to the decreasing of CO2 emission. The authors in the paper (Hagspiel et al., 2018) analysed green investment as an investment in renewable energy. Mielke, J., and Steudle, G. A. (2018) analysed green investment as capital in technologies and projects for climate change mitigation. Thus, the main difficulty is to determine and to identify the green assets. The EU commission in the "Action Plan: Financing Sustainable Growth" declared the creation of the EU system of sustainable classification activities as a first step by the end of 2019.Noticed, that the experts in the document (European, 2018) supposed that sustainable finance should base on two milestones: increasing volume of financing in sustainable and inclusive growth through the funding society's need in long-term period; achieving the financial stability through the consolidation environmental, social and governance (ESG) factors into investment decision-making (European, 2018). Therefore, in the paper (Eyraud et al., 2013) green investments were classified by the authors into three groups:

investment to provide low-emission energy supply; investment to provide the increasing of energy efficiency; investment to provide the changes in the forest and agricultural management (Eyraud et al., 2013). Noticed that the authors focused on renewable or green technologies excluding the investment in green education, green actions, carbon sequestration and etc. They explained such chosen by the lack of dataset and difficult to estimate. The authors in the investigation (Martinez-Oviedo, Medda, 2018) classified green investment into two groups relate on tangibles of assets: real (green technologies, green product and etc.) and non-real green investment (property rights for green technologies and product, green stocks and green bonds). The results of the analysis of the scientific papers justified that green investment's classification isn't so different from the traditional approach to classifying the general investment. In the report (Inderst, 2012) the experts underlined, that green investment is closely connected with the type of investing and allocate investment approaches which shown in table 1.

Table 1: Approaches to classifying the green investment (Compiled by the authors on the basis (Inderst et al., 2012)

APPROACHES	TYPES
Green investing	eco-friendly, carbon, climate change investing and etc.
The E in ESG	environmental, social and governance investing.
Thematic investing	in green sectors or themes such as water, agriculture
SRI	socially or sustainable responsible investing
Impact investing (including microfinance)	which provide a positive impact on the environment
Long-term investing	which oriented not for the short-term profit, so orient on stable profit and long-term results.
Universal ownership concept	Investment in the wide range of green asset classes distributed among economic sectors that the organization effectively owns a slice of the broad economy.
Double or triple-bottom-line investing	During making decisions on green investing considering not only economic but social and ecological goals; based on the sustainable development concept.

From the other side, the authors in the works (Vyshnickaya, 2013; Kvaktun, 2014; Heinkel, 2003) highlighted that green investment involves all abovementioned investments in table 1 and these are types of green investment. So, as the universal definition of green investment isn't accepted the universal classification of green investment hasn't existed yet. The results of the analysis of the scientific papers (Inderest et al., 2012) showed that green bond is the most popular type of green investment. Besides, the experts from UBS Wealth Management assumed that 93% from investors who invest in green economy sure that green investment is more profitable than traditional (Yiu, Choi, 2018). From the other side, the stereotype that green investment is non-profitable still exist. Firstly, it is the consequences of that such investments have the huge payback period which negative influence on making decision invest or not.

Thus, the boosting of green investment market contributes to overcoming some barriers as follows:

- develop the fundamental theory of green investment market with allocation the main players and their role and duties;
- develop the legislative base of green investment market;
- develop a universal system of accounting green investment;
- develop the policy to support the green investors with indicating the advantages and perspectives of green investment.

The authors in the paper (Adeel-Farooq et al., 2018) proved the correlation between greenfield investment and the country's environmental performance which is a basis of the sustainable economic growth. The authors used the Environmental Performance Index as an indicator of the country's environmental performance.The Chinese scientists in the work (Wang et al., 2018) proved the positive relationship between government policy and green investment. In the paper (Eyraud et al., 2013) the scientists proved the linking between economic growth, interest rates, fuel prices and volume of green investment. Therefore, they made the conclusion that economic growth, low-interest rates, and high fuel prices have a positive impact on green investment market. The authors in the works (Azhgaliyeva et al., 2018) investigated the correlation between green investment and fiscal policy to support renewable energy. The findings showed that feed-in tariff and loans had a positive effect on private green investment, so the grants, subsidies, taxes and government spending on R&D have not a significant impact on private green investment. In the paper (Afni et al., 2018) the scientists proved that green investment had a positive influence on the disclosure of carbon emissions. In their work   Green investment was analysed through the Social Responsible Investing Index. Besides, they assumed that green investment could come from the additional investing or from green Foreign Direct Investment as a source of private sector financing and transfer of technology between countries (Afni et al., 2018). In this case, according to the traditional economic theory, the volume of foreign direct investment could be higher if country demonstrated the stable economic growth and had the positive and stable investment climate which could be characterized by the special indexes. In the framework of the sustainable development concept and green investing, the green investing climate could be characterized by the indexes as follows: Environmental Performance Index, Social Responsible Investing Index, Sustainable Development Goals Index, Global Sustainable Competitiveness Index. Therefore, the Sustainable Development Goals Index (SDGs Index) and Global Sustainable Competitiveness Index (GSCI) described the country's positions on the way for achieving the SDGs 2030. The main goal of this paper is analysing the linking between the country's contribution to the international commitment on climate-related expending, the volume of climate finance (as a type of green investments) and the country's rating on the GSCI as the indicator of achieving the SDGs 2030.

3. METHODOLOGY

Under this research for analysis, the authors used the software Stata 14.0. As a type of green investment used the country's contribution to the international commitment to climate-related expending and volume of climate finance. The dataset of GSCI was obtained from the official reports. GSCI consists of 111 indicators obtained from reliable sources, such as the World Bank, the IMF, and different UN agencies. All indicators are grouped into 5 sub-indexes:

- Natural Capital;
- Resource Efficiency & Intensity;
- Intellectual Capital;
- Governance Efficiency
- Social Cohesion.

Thus, in the paper the authors checked hypotheses:

- H1: linking between the country's contribution to the international commitment on climate-related expending(CM)and the country's rating on the GSCI;
- H2: linking the volume of climate finance (GFI) and the country's rating on the GSCI.

At the first step authors of the analysis, the cluster analyses were used which based on Ward's agglomerative hierarchical clustering procedure (which based on the principal component analysis).

With the purpose to check the correlation between indicators, the authors proposed to use regression analysis. The authors used a matrix of Pearson's correlation coefficients (r) (formula 1).

$$r = \frac{n(\sum xy) - (\sum x)(\sum y)}{\sqrt{[n\sum x^2 - (\sum x)^2][n\sum y^2 - (\sum y)^2]}} \qquad (1)$$

For checking abovementioned hypnosis, the authors used the databases as follows: World Data Bank, Eurostat, Reports of OECD, Reports of European Investment Bank, Reports of Climate Bonds Initiative, Sustainable Development Index. For the analysis, the European countries were chosen.The dataset of CM was taken from Eurostat, the climate finance was estimated though indicator which characterised the value of greenfield investment on green projects which obtained from UNTCAD (2018).

4. RESULTS

The results of the analysis showed that emerging and developed countries influence on climate with different power. Thus, the world-leader countries on GNI per capita have higher CO_2 emission than countries with less GNI. The classifications of the county are presented in table 2.

Table 2: Classification of the countries according to the World Data Indicators
(World Bank, 2018)

GROUP OF COUNTRIES	GNI PER CAPITA IN 2017
High-income	$12,056 or more
Upper-middle-income	$3,896 and $12,055
Lower-middle-income	$996 and $3,895
Low-income	$995 or less

Figure 1 showed that high-income countries have been producinga huge volume of CO_2 emission compare with Low-income countries. From the other side, the tendency of CO_2 emissions in high-income countries could be described as decreasing. Thus, in 2014 the CO_2 emissions were less compared with the 1990 year. Besides, the decreasing of CO_2 emissions has started in 2007 among high impact countries. On the other hand, the world tendency of CO_2 emissions has been continuing to increase compared with the 1990 year. Firstly, it was a consequence of the rapid developing of upper-middle-income countries. Therefore, the low income and low middle-income countries haven't declined the volume of CO_2 emissions yet.
The results of comparative analysis of CO_2 emission showed (figure 2) that compare to the 1990 year in 2016 the emissions in the world-leader countries increased by 100–300%, particularly China by 353% in 2016 compare to 1990, the USA – 101%, India – 287%. From the other side, in 2016 some countries have already decreased their CO_2 emission to the environment: Moldova – by 74%, Ukraine by 70%, Lithuania and Latvia 60%, Romania – 58%, United Kingdom – 36% and etc.
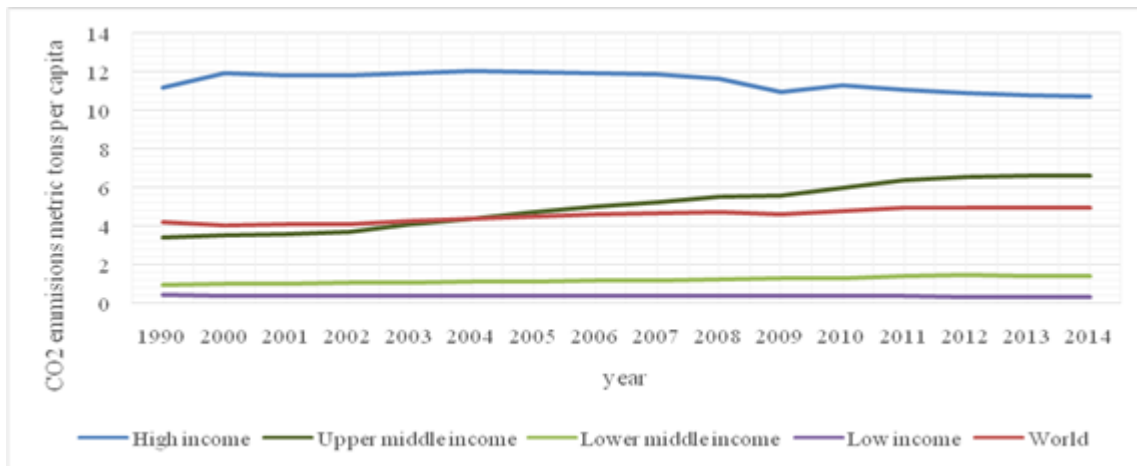
Figure following on the next page

Figure 1: CO2 emissions under the country's group (metric tons per capita)
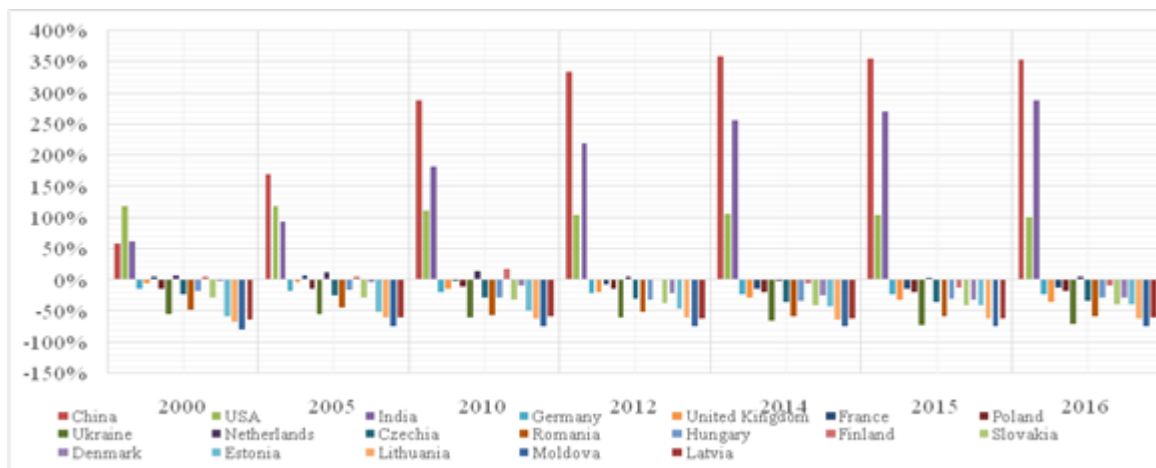*(World Bank, 2018)*

Figure 2: The changing of share in the world CO2 emissions among analysed countries
(compare to 1990) (developed by authors on the basis of Fossil CO2, 2017)

Noticed, that at the 21st Conference of the Parties the developed-country declared to increase their level of financial support, providing USD 100 billion annually by 2020 with a concrete roadmap to achieve the SDGs (European Environment, 2018).The results analysis of spending from budget among EU countries proved the positive growth of green finance volume in 2016 compared with 2014 and 2015 years. Thus, the leader in contribution to the international 100bn USD commitment for climate finance among EU countries is Denmark, Germany, France, United Kingdom. The abovementioned results of analysis proved that decreasing of CO2 emissions contribute the additional financial recourses. Thus, countries with high GNI have more financial recourses to decline the negative impact on the environment. At the same time, low-income countries don't have significance financial recourses to finance the greening of the economy. In this case, we received the vicious cycle: low-income countries produced less CO2 emissions, but CO2 emissions tendency has been still increasing and these countries don't have enough financing to decline this tendency. Thus, for low-income countries is more actual to attract additional green investment. The main indexes which characterized the country's efficiency on achieving of SDGs are SDG Index and Global Sustainable Competitiveness Index (GSCI). Thus, according to the official report SDG Index (Sachs et al., 2018), the first ten positions was also occupied by the high-income countries: Denmark, Germany. Besides, according to the dataset in table 3, the countries in the first position on SDG Index made a higher contribution to the international commitment on climate-related expending.

According to the report of GSCI (The Sustainable, 2017), the countries form high-income group have a high ranking on GSCI. The experts proved the correlation between Sustainable Competitiveness score and GDP per capita or income levels (The Sustainable, 2017). With the purpose to estimate the sufficient level of green investing in achieving the SDG, the cluster analysis was done. At the first step, the results of the cluster analysis showed that dividing into four clusters wasn't adequate, because in two clusters only by one country was (table 3): cluster 3 – France and cluster 4 – Germany.

Table 3: The findings of cluster analyses (four clusters) (the authors' calculations)

Cluster	CM	GFI	GSCI
1	464.0129	8613.711	51.92429
2	25.578	2505.653	50.792
3	3334.84	14119.66	51.78
4	8534.08	13617.44	52.06

At the next step, two clusters were allocated. The finding of cluster analysis showed in table 4. In the second cluster, the following countries were Germany, France, Poland, United Kingdom and Spain. The minimum volume of CM – 143,79 and GFI – 359,04 mln EUR for that cluster. Thus, if the developing countries (such as Ukraine) wish to move to the first cluster should spend in average 165,08 mln EUR of CM (5934.46 mln EUR for the second cluster) and 16182.43 mln EUR of GFI (16182.43 mln EUR). Besides, such volume of green investment corresponds to the average score of GSCI – 51,15 (for the second – 51,92).

Table 4: The findings of cluster analyses (four twoclusters) (the authors' calculations)

Cluster	CM	GFI	GSCI
1	165.08	2352.932	51.15227
2	5934.46	16182.43	51.92429

With the purpose to check the correlation between CM, GFI and GSCI the Pearson's correlation analysis was done. The finding presented in table 5.

Table 5: The matrix of Pearson correlation coefficient for EU countries
(the authors' calculations)

	CM	GFI	GSCI
CM	1		
GFI	0.7774* 0.0000	1	
GSCI	0.6692** 0.0294	0.7518** 0.0490	1

*Note: *, ** represents significance at the 1% and 5% levels.*

The obtained results of Pearson's correlation analysis between GSCI, greenfield investment and country's contribution to the international commitment on climate-related expending proved the relation between abovementioned indicators. The correlation between GSCI and CFI exist with probability 75% and correspond significance 5%. The correlation between GSCI and CM exist with a probability of 67% and correspond significance 5%. With the purpose to check the statistical significance of the correlation between GFI, CM and GSCI the econometric method was used (table 6).

*Table 6: The results of the analysis the linking between GFI, CM and GSCI
(the authors' calculations)*

Independent variables	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
GFI	.0033569	.0009793	3.43	0.002	.0013311	.0053828
CM	.0093161	.0053054	1.76	0.092	-.0016589	.0202912
Depended variables – *GSCI*						

Thus, the findings (table 6) showed the statistical significance relation between GSCI, greenfield investment and country's contribution to the international commitment to climate-related expending. Therefore, the increase by one point of GFI leads to increasing of GSCI score by 0,034 points, the increasing of CM by one point lead to increasing of GSCI score by 0,093 points.

5. CONCLUSION

The results of analysis of EU experience showed that green investment is a perspective alternative recourse to finance the achieving of SDG 2030. However, the obtained results allocated the problems which restrict green investment market development: no universal normative and legislating bases, statistical accounting, lack of knowledge and information. From the other side, the investigation results of EU experience on developing and supporting of green investment market showed that adequate incentive mechanism stimulates the increase of greenfield investment and contribution to the international commitment on climate-related expending. The obtained results showed that countries, which try to develop green projects and allocate for that purpose additional financing were more effective in achieving the SDGs 2030 and hada higher position on GSCI. Besides, the obtained results proved the researcher's hypotheses, but the impact of chosen indicators CM and GFI were not so huge. In this case, for further research, it is necessary to allocate and analyse other more impactful indicators.

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