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ASSESSMENT OF THE IMPACT OF SUSTAINABLE DEVELOPMENT GOALS INDICATORS ON THE SUSTAINABLE DEVELOPMENT OF FINTECH INDUSTRY

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Abstract. FinTech industry development creates the conditions for financial inclusion, which in turn enables the achievement of 8 out of 17 SDGs towards global sustainable development. Accordingly, to achieve sustainable economic development, full financial inclusion and the SDGs, it is crucial to achieve sustainable FinTech industry development and clarify its relationship with the SDGs, since research to date is limited and examines the connection in the narrow sense. Therefore, this paper presents the pilot study on the contribution of SDG indicators to the sustainable FinTech industry development, indicates the main drivers and provides recommendations for further development of FinTech industry in terms of sustainability. The pilot results of expert assessment show that SDG 8 "Decent Work and Economic Growth" contributes to the sustainable FinTech industry development the most, followed by SDG 9 "Industry, Innovation and Infrastructure", SDG 4 "Quality Education", SDG 16 "Peace, Justice and Strong Institutions". The pilot results of the multicriteria assessment show that out of 15 European countries, Lithuania has the most sustainable development in terms of FinTech industry, followed by Estonia, Denmark, Finland. These results suggest that Northern Europe is the most suitable European region for sustainable FinTech industry development.

Keywords: FinTech development, Sustainable Development Goals (SDG), Agenda 2030, multi-criteria decision methods, Simple Additive Weighting (SAW).

JEL Classification: O11, O32, Q01, Q55.

Introduction

The 2030 Agenda for Sustainable Development, adopted by 193 United Nations Member States in 2015, is a plan of action for people, planet and prosperity in order to achieve global sustainable development. At its heart are the 17 Sustainable Development Goals (SDGs), which are integrated and indivisible and balance the three dimensions of sustainable development: the environmental, social and economic. Therefore, sustained, inclusive and sustainable economic growth is essential for prosperity (UN General Assembly, 2015).

Financial inclusion provides an opportunity to have access to useful and affordable financial products and services, like credit, insurance, payments, savings and transactions, delivered in a sustainable and responsible way, and is a key enabler to boosting prosperity and reducing poverty (World Bank, 2018). Financial inclusion has been identified as an enabler for 8 of the 17 SDGs.

Financial inclusion and FinTech have several benefits to financial service users, fintech providers, government and the economy such as increasing access to finance among poor as well as increasing aggregate expenditure for governments (Nizam et al., 2020). Therefore, FinTech has created enormous excitement in the international development community, because it is widely thought capable of achieving "full" financial inclusion and is expected to be a game-changer in terms of improving the lives of the global poor (Bateman, 2020). However, according to 2017 data, 31 percent of the world's adults still did not have a bank account (Demirguc-Kunt et al., 2018). This means that FinTech industry through digital finance has the opportunity and the potential to provide access to financial services to 1.6 billion people. It could increase the volume of loans extended to individuals and businesses by $2.1 trillion and allow governments to save $110 billion per year by reducing leakage in spending and tax

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revenue. Financial-services providers would benefit as well by saving $400 billion annually in direct costs while sustainably increasing their balance sheets by as much as $4.2 trillion (Manyika et al., 2016). The full potential of FinTech to support financial inclusion and the SDGs will only be realized with a progressive approach to developing infrastructure to support digital financial transformation (Arner et al., 2020).

Accordingly, to achieve sustainable economic development, "full" financial inclusion and SDGs, it is crucial to achieve sustainable development of FinTech industry. To this end, it is important to clarify the relationship between sustainable development of FinTech industry and SDGs. However, research to date is limited and only examines the inverse relationship how the FinTech industry contributes to achieving SDGs. There are no studies on SDG contribution to the sustainable FinTech industry development.

Therefore, the purpose of this study is to examine the contribution of SDG indicators to the sustainable development of FinTech industry, indicate the main drivers and provide recommendations for further FinTech industry development in terms of sustainability for the sustainable development of the economy.

The research methods used in the preparation of this study were analysis of scientific literature, data collection and partial processing, expert evaluation, determination of significance of indicators, normalization of indicator values, multicriteria evaluation.

1. Literature review

Growth is necessary for industries and economies to survive and thrive, and the future of growth must be both sustainable and inclusive (Manyika et al., 2016). In the mature G-7 economies, GDP growth has halved to 1 percent per year on average since the 2008 global financial crisis (International Monetary Fund [IMF], 2021). The same tendency is seen in the emerging economies (except for China and India), where growth has been lower recently than it was about 20 years ago.

There is academic evidence that financial inclusion can support overall economic growth and the achievement of broader development goals (Nkwede, 2015; Sharma, 2016; Williams et al., 2017; Sulong & Bakar, 2018; Mushtaq & Bruneau, 2019; Ratnawati, 2020; Bayar et al., 2021; Van et al., 2021). Financial inclusion is positioned prominently as an enabler of SDGs, where it is featured as a target in 8 of the 17 goals. These include SDG 1 "No Poverty", SDG 2 "Zero Hunger", SDG 3 "Good Health and Well-being", SDG 5 "Gender Equality", SDG8 "Decent Work and Economic Growth", SDG 9 "Industry, Innovation and Infrastructure" and SDG 10 "Reduced inequalities". SDG 17 "Partnership for the Goals" has an implicit role for greater financial inclusion through greater savings mobilization for investment and consumption that can spur growth (UN Capital Development Fund [UNCDF], 2022).

FinTech provides equal and affordable financial services to the poor, promoting inclusive finance (Cen & He, 2018). Digital financial services, enabled by the FinTech industry, have become an important driver of financial inclusion boosting annual economic growth by up to 2.2 percent (IMF, 2021). Recent results of the correlation analysis confirmed the existence of a direct correlation between GDP per capita and selected banking sector digitalization indicators, so FinTech development contributes to economic growth by increasing GDP generated in the financial sector (Sadigov et al., 2020). The FinTech industry alone could further benefit billions of people by spurring inclusive growth that adds $3.7 trillion (6 percent) to the GDP of emerging economies and 95 million new jobs by 2025 (Manyika et al., 2016). The latest financial data also shows that in 2021, FinTech investment globally reached 210 billion dollars with a record of 5684 deals, surpassing the previous high of 2013.8 billion dollars and 3863 deals set in 2019 (KPMG, 2021). Therefore, the rapid development of the FinTech industry is not only fueling financial inclusion, but drives competitiveness, supports job creation and ensures long-term economic growth. Moreover, green finance and environment-friendly FinTech is a strong driving force for sustainable economic development (Cen & He, 2018). Therefore, studying the interactions among FinTech, green finance and sustainable development is theoretically and practically significant (Cen & He, 2018). For all the above reasons, it is important to foster the sustainable FinTech industry development.

The development of the Fintech industry can be stimulated by creating favorable external environment conditions at the national level (Pauliukevičienė & Stankevičienė, 2021a), but for the sustainable Fintech development, it is important to refine the interaction between the FinTech industry development and SDGs. Recent research has shown that there is a statistical link between the FinTech political, economic, social and technological (PEST) environment and SDG 4 "Quality Education", SDG 8 "Decent Work and Economic Growth", SDG 9 "Industry, Innovation and Infrastructure", SDG 16 "Peace, Justice and Strong Institutions", which suggests that FinTech PEST environment and SDG 4, SDG 8, SDG 9, SDG 16 are dependent (Pauliukevičienė & Stankevičienė, 2021b). It is therefore important to examine which specific SDG 4, SDG 8, SDG 9 and SDG 16 indicators contribute to the sustainable FinTech industry development and how they contribute to the sustainable FinTech industry development, since each of these SDGs has between 7 and 11 indicators. However, there are no studies on SDG contribution to the sustainable FinTech industry development, the research available today examines only the inverse relationship, which is how the FinTech industry contributes to achieving SDGs through digital financial services and therefore, financial inclusion. The list of authors, articles and reports available on the topic of interrelation of FinTech industry and SDGs on the day of submitting the study is presented in the Table 1 in alternate years.

Table 1. Articles and reports on the interrelation of FinTech industry and SDGs (source: created by the authors, 2022)

The Author	The Interrelation
UN Secretary – General's Special Advocate [UNSGSA] et al., 2018	Opportunities through digital finance: SDG 4 – digital finance makes education expenses more manageable; helps education systems to improve the financial management; frees up resources for teachers, materials, technologies improving education outcomes; SDG 8 – digital finance fuels low-cost business models with the potential to create 95 million new jobs and add 6% to global GDP by 2025; SDG 9 – digital finance enables small businesses to grow, innovate, reach new markets, bringing more people into the digital economy; SDG 16 – digital payments dramatically improve transparency of transactions to and from governments; helps to hold governments accountable to a higher standard for usage of public funds; increases the funds available for vital public services, investments, transfers.
Hinson et al., 2019	The provision of mobile financial services may have positive effects on health (SDG 3), employment (SDG 8), education (SDG 4) and poverty alleviation (SDG 1) through increased productivity.
Bedoui & Robbana, 2019	Digital social finance contributes to achieving: SDG 4 – government spending on education reduces through electronic payment; the leakage savings helps in paying teachers which improves productivity and reduces absenteeism; SDG 8 – electronic payments raise the pool of savings, big data help reducing risks by having access to data history of lenders; SDG 9 – digital finance empowers the entrepreneurship ecosystems worldwide by developing new business models, start-ups and products; SDG 16 – digital finance transparency enables better monitoring of corruption.
Shipalana, 2019	Financial inclusion has been identified as an enabler for 7 of the 17 SDGs and contributes to the fulfilment of SDG 8 and SDG 9.
Walker, 2019	Legal reform in support of FinTech and small business fundraising can facilitate SDG 8.
Hoang et al., 2022	Digital finance increasingly demonstrates the potential to address obstacles relevant to the growth of finance for sustainable development.

Therefore, the following chapters of this study will address the problem of science refined by the literature analysis.

2. Research methodology

The research methodology of the study consists of:

– Data collection and partial processing. 15 European countries from 4 different European regions were selected for an assessment of the impact of SDG indicators on the sustainable development of FinTech industry: Poland, representing Eastern Europe; Denmark, Estonia, Finland, Latvia, Lithuania, Sweden, the United Kingdom, representing Northern Europe; Italy, Portugal, Spain, representing Southern Europe; and Austria, France, Germany, the Netherlands, representing Western Europe (United Nations [UN], 2019). Recent research suggests that FinTech PEST environment and SDG 4, SDG 8, SDG 9, SDG 16 have statistical links, therefore, they are dependent (Pauliukevičienė & Stankevičienė, 2021b). Accordingly, SDG 4, SDG 8, SDG 9, SDG 16 indicators were selected for this study. Since each of these SDGs has a different set and number of indicators, 4 indicators from each group most related to FinTech industry were selected for further research by eliminating unrelated indicators, indicators for which numerical values were of little significance, and indicators for which values were not available for all countries analyzed in this study. The final composition of sustainable development assessment indicators in terms of FinTech industry is provided in Table 2. In order to prepare for the empirical research, data publicly available from Sustainable Development Report 2021 was collected and partially processed (Sachs et al., 2021). All data was standardized and expressed as a percentage.

– Expert evaluation. After the establishment of the composition of sustainable development assessment indicators in terms of the FinTech industry, the significance of the indicators was determined. An expert assessment carried out in January 2022 was used for this purpose. The questionnaires were sent to 15 national experts representing business, science and public sectors, carrying out activities related to sustainable economic development, with at least 10 years of experience in a position at least as senior manager. However, responses were received from only 7 experts. According to the methodological assumptions formulated in the classical test theory, the reliability of decisions and the number of decision-makers are linked by a rapidly deteriorating nonlinear relationship. Therefore, the assessment of a small group of 7–9 experts may be as reliable as the assessment of a larger group, as the standard deviation for the eighth expert is practically not changing (Libby & Blashfield, 1978).

Experts were asked to:

1) Rank the "Decent Work and Economic Growth" (SDG 8) indicators in order of importance for the sustainable FinTech industry development, then assess the significance of the indicators in one hundred parts;
2) Rank the "Industry, Innovation and Infrastructure" (SDG 9) indicators in order of importance for the sustainable FinTech industry development, then assess the significance of the indicators in one hundred parts;
3) Rank the "Peace, Justice and Strong Institutions" (SDG 16) indicators in order of importance for the sustainable FinTech industry development, then assess the significance of the indicators in one hundred parts;

4) Rank the "Quality Education" (SDG 4) indicators in order of importance for the sustainable FinTech industry development, then assess the significance of the indicators in one hundred parts;
5) Rank the Sustainable Development Goals in order of importance for the sustainable FinTech industry development, then assess the significance of the indicators in one hundred parts.

Table 2. Composition of sustainable development assessment indicators in terms of FinTech industry (source: created by the authors, 2022)

SDG	No.	Indicator
SDG 4	1.1	PISA score
	1.2	Tertiary educational attainment
	1.3	Underachievers in science
	1.4	Variation in science performance explained by socio-economic status
SDG 8	2.1	Adjusted GDP growth
	2.2	Adults with an account at a financial institution
	2.3	Employment-to-population ratio
	2.4	Youth not in employment, education or training
SDG 9	3.1	Expenditure on R&D
	3.2	Gap in internet access by income
	3.3	Mobile broadband subscriptions
	3.4	Population using the internet
SDG 16	4.1	Corruption Perception Index
	4.2	Proportion of population that feel safe walking alone around the area they live
	4.3	Press Freedom Index
	4.4	Property Rights

In order to obtain reliable expert evaluation results, the Kendall's Coefficient of Concordance (W) was calculated, which shows the level of compatibility of expert opinions, or in other words, the agreement among assessments of the experts (Kendall, 1970). The values of the Kendall's Coefficient of Concordance are between 0 and 1. The value being close to 1 shows that experts' assessments are unanimous and value being close to 0 shows that experts' assessments vary very much. The concordance calculation according to Kendall's W coefficient is calculated by each ranked object by the following Formula 1 and Formula 2, which are used when there are no ties in each experts' ranks:

$$W = \frac{12S}{n^2\left(m^3 - m\right)}, \quad (1)$$

where n – the number of experts; m – the number of objects to evaluate.

$$S = \sum_{i=1}^{m}\left(\sum_{j=1}^{n} r_{ij} - \overline{r}\right)^2, \quad (2)$$

where S – a sum-of-squares statistic over the row sums of ranks m_i, r_{ij} – a sum of ranks, $\overline{r}$ – an average of sum of ranks.

– Determination of the significance of indicators. The average of experts' assessment was calculated and the accumulated data was used for an empirical study.
– The normalization of the indicators' values was performed in order to merge them into a single summative value.
– Multicriteria assessment. Simple Additive Weighting (SAW) method as a Multicriteria decision support method for expert evaluation was used. The choice of the multi-criteria assessment method ends the ranking process of overall sustainable development performance in terms of the FinTech industry.

The results of the study were statistically processed by Microsoft's Excel program.

3. Research results

The significance of selected SDG indicators as well as SDGs was determined by expert evaluation and is presented in Table 3. According to the pilot evaluation results, SDG 8 "Decent Work and Economic Growth" has the biggest impact on the sustainable development of FinTech industry, since it was given the highest significance, followed by SDG 9 "Industry, Innovation and Infrastructure" and SDG 4 "Quality Education", the significance of which has been assessed by the experts as quite similar. The lowest significance was given to SDG 16 "Peace, Justice and Strong Institutions" as the least influential on the sustainable FinTech industry development.

Table 3. Significance of Sustainable Development Goals indicators determined during the expert evaluation (source: developed by the authors, 2022)

Group of Indicators	Indicator	Significance
SDG 4	1.1	0.336
	1.2	0.273
	1.3	0.147
	1.4	0.244
SDG 8	2.1	0.291
	2.2	0.316
	2.3	0.273
	2.4	0.120
SDG 9	3.1	0.291
	3.2	0.116
	3.3	0.283
	3.4	0.310
SDG 16	4.1	0.349
	4.2	0.117
	4.3	0.256
	4.4	0.279
SDGs	SDG4	0.244
	SDG8	0.336
	SDG9	0.273
	SDG16	0.147

In order to obtain reliable expert evaluation results, the Kendall's Coefficient of Concordance (W) was calculated and is presented in Table 4. Evaluating the indicators of Sustainable Development Goals W ranges from 0.40 to 0.53, which is an average result indicating that there is some level of agreement between the experts regarding the SDG 4, SDG 8, SDG 9, SDG 16 indicators in terms of sustainable development of FinTech industry. However, the most common condition in the modern scientific literature is that the result of W must be greater than 0.60 in order to be considered significant (Kunskaja, 2018; Skačkauskienė & Švogžlys, 2021). Accordingly, although there is some consistency in expert opinion, the study should be supplemented in the future in order to achieve a more significant and reliable result. Therefore, the further results of the study are presented as pilot results.

Table 4. Compatibility of expert assessment (source: developed by the authors, 2022)

Group of Indicators	Kendalls' Coefficient of Concordance (W)
SDG 4	0.50
SDG 8	0.40
SDG 9	0.51
SDG 16	0.53
SDGs	0.49

Based on the results of expert's assessment of the significance of the indicators, it can be concluded that:

- The most significant indicator for assessing the sustainable development of FinTech industry in terms of SDG 4 "Quality Education", as the main driver, is PISA score, while the least significant indicator is underachievers in science.
- The most significant indicator for assessing the sustainable FinTech industry development in terms of SDG 8 "Decent Work and Economic Growth", as the main driver, is adults with account at a financial institution, while the least significant indicator is youth not in employment, education or training.
- The most significant indicator for assessing the sustainable FinTech industry development of in terms of SDG 9 "Industry, Innovation and Infrastructure", as the main driver, is population using the internet, while the least significant indicator is gap in internet access by income.
- The most significant indicator for assessing the sustainable FinTech industry development in terms of SDG 16 "Peace, Justice and Strong Institutions", as the main driver, is Corruption Perception Index, while the least significant indicator is proportion of population that feel safe walking alone around the area they live.

In order to assess the sustainable development performance of each country in terms of FinTech industry in each SDG, multi-criteria assessment (SAW method) was used. Every SDG indicator value was expressed as a percentage, normalized, multiplied by its weight, determined by the experts, and the numbers obtained after multiplication were summed in each SDG category. Therefore, the values of different SDGs in terms of sustainable FinTech industry development are presented in Table 5.

Table 5. The values of different Sustainable Development Goals in terms of sustainable development of FinTech industry (source: developed by the authors, 2022)

SDG 4		SDG 8	
France	0.076	Lithuania	0.105
Lithuania	0.071	Estonia	0.096
Netherlands	0.070	Poland	0.080
Sweden	0.069	Latvia	0.078
UK	0.069	Denmark	0.078
Poland	0.068	France	0.069
Germany	0.068	Finland	0.068
Denmark	0.067	Portugal	0.065
Austria	0.067	Netherlands	0.065
Portugal	0.067	Spain	0.056
Finland	0.065	Austria	0.055
Spain	0.065	Germany	0.048
Estonia	0.063	UK	0.044
Latvia	0.062	Italy	0.043
Italy	0.053	Sweden	0.042
SDG 9		SDG 16	
Denmark	0.079	Finland	0.078
Finland	0.078	Denmark	0.077
Sweden	0.077	Netherlands	0.075
Austria	0.074	Sweden	0.073
Poland	0.073	Austria	0.072
Germany	0.070	Germany	0.070
Estonia	0.068	Estonia	0.069
Netherlands	0.065	UK	0.067
France	0.064	France	0.064
Italy	0.062	Portugal	0.064
Latvia	0.061	Spain	0.062
Lithuania	0.060	Lithuania	0.060
Portugal	0.058	Latvia	0.057
Spain	0.057	Italy	0.056
UK	0.055	Poland	0.054

Based on the results of expert's assessment of the significance of the indicators it can be concluded that:

- France is the most progressive in "Quality Education" in terms of SDG 4 indicators and sustainable development of FinTech industry, followed by Lithuania and the Netherlands. Meanwhile, Estonia, Latvia and Italy have the worst results in this group of indicators.
- Lithuania is the most progressive in "Decent Work and Economic Growth" in terms of SDG 8 indica-

tors and sustainable development of FinTech industry, followed by Estonia and Poland. Meanwhile, the United Kingdom, Italy and Sweden have the worst results in this group of indicators.
- Denmark is the most progressive in "Industry, Innovation and Infrastructure" in terms of SDG 9 indicators and sustainable development of FinTech industry, followed by Finland and Sweden. Meanwhile, Portugal, Spain and the United Kingdom have the worst results in this group of indicators.
- Finland is the most progressive in "Peace, Justice and Strong Institutions" in terms of SDG 16 indicators and sustainable FinTech industry development, followed by Denmark and the Netherlands. Meanwhile, Latvia, Italy and Poland have the worst results in this group of indicators.

In order to assess the overall sustainable development performance of each country in terms of FinTech industry and rank the countries, multi-criteria assessment (SAW method) was continuously used. Every SDG category value, presented in Table 5, was multiplied by its weight, determined by the experts and presented in Table 3, and the numbers obtained after multiplication were summed. Therefore, the values of overall sustainable development performance of 15 European countries in terms of FinTech industry are presented in Table 6.

Table 6. The values and ranking of overall sustainable development performance in terms of FinTech industry (source: developed by the authors, 2022)

Rank	Country	Result
1.	Lithuania	0.078
2.	Estonia	0.077
3.	Denmark	0.075
4.	Finland	0.072
5.	Poland	0.071
6.	France	0.069
7.	Latvia	0.066
8.	Austria	0.066
9.	Netherlands	0.065
10.	Portugal	0.064
11.	Sweden	0.063
12.	Germany	0.062
13.	Spain	0.059
14.	United Kingdom	0.057
15.	Italy	0.053

According to the results of an empirical study of the paper, Lithuania has the most sustainable development in terms of FinTech industry, followed by Estonia, Denmark and Finland. Such Lithuania's position in the ranking was strongly influenced by the highest result in SDG 8, which also has the highest significance as a group of indicators assessed by the experts, as well as a high result in SDG 4. Estonia took the second position in the overall ranking because of the second highest result in SDG 8. Whereas Denmark and Finland share the first and second positions in SDG 9 and SDG 16 rankings. Therefore, these countries took third and fourth places in the overall sustainable development ranking in terms of the FinTech industry. These results suggest that Northern Europe is the most suitable European region for the sustainable FinTech industry development.

Since one of the objectives of this study is to provide recommendations for further development of FinTech industry in terms of sustainability, on the basis of empirical research results, the following general preliminary recommendations for all countries ranked are provided:
- Focus on SDG 8 "Decent Work and Economic Growth" indicators to ensure the sustainable development of FinTech industry in each country, especially on the adults with account at a financial institution, adjusted GDP growth and employment-to-population ratio (%). This recommendation is particularly relevant for Italy and Sweden.
- Focus on the improvement of SDG 9 "Industry, Innovation and Infrastructure" indicators, especially on population using the internet and expenditure on R&D. This recommendation is particularly relevant for Italy and Latvia.
- Pay more attention to the improvement of SDG 4 "Quality Education" indicators, especially to PISA score and tertiary educational attainment. This recommendation is particularly relevant for Italy.
- Draw attention to SDG 16 "Peace, Justice and Strong Institutions" indicators, especially to Corruption Perception Index, property rights and Press Freedom Index. This recommendation is particularly relevant for Italy and Poland.

In addition, on the basis of empirical research results, the following preliminary recommendations for further development of Lithuanian FinTech industry in terms of sustainability are provided:
- Take measures to encourage an increase in the number of adults with account at a financial institution. The significance of this indicator is the highest in SDG 8 "Decent Work and Economic Growth" group of indicators, and according to the research of this study, Lithuania has the worst result of this indicator out of 15 European countries assessed with only 82.5 percent adults with account at a financial institution.
- Significantly increase gross domestic expenditure on scientific research and experimental development (R&D). The significance of this indicator is second the highest in SDG 9 "Industry, Innovation and Infrastructure" group of indicators, and according to the research of this study, Lithuania has the second worst result of this indicator out of 15 European countries assessed.
- Pay more attention to the country's PISA score results. The significance of this indicator is the highest in SDG 4 "Quality Education" group of indicators, and according to the research of this study, Lithu-

ania has the second worst result of this indicator out of 15 European countries assessed, which means that the average results of reading, mathematics and science of 15-year-olds in schools requires much more focus.
– Review the results of all four SDG 16 "Peace, Justice and Strong Institutions" indicators and delve into the reasons for these results as they are very mediocre and could be improved in the future for a more sustainable FinTech industry development in Lithuania.

4. Discussion

The pilot results of the study show that Lithuania has the most sustainable development in terms of FinTech industry, followed by Estonia, Denmark and Finland. Comparing this country ranking with the overall Global FinTech Index 2021 and the overall SDG achievement, it can be seen that despite the high position of Lithuania, Estonia, Denmark and Finland in the ranking of overall sustainable development performance in terms of FinTech industry, these countries rank average in the Global FinTech Index among the 15 countries selected for this study. As a result, these countries have the potential for greater Fintech industry development in the future, as does France, Austria, Latvia, Portugal and Poland.

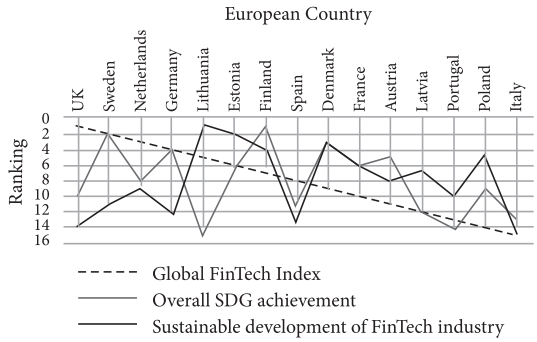

Figure 1. Comparative analysis of 15 European countries based on the Global FinTech Index, overall SDG achievement and sustainable FinTech industry development ranking (source: developed by the authors based on Findexable (2021) and Sachs et al. (2021))

Meanwhile, Figure 1 shows that the United Kingdom, Sweden, the Netherlands, and Germany with the lowest positions in the context of sustainable FinTech industry development have the highest positions in the Global FinTech Index 2021. Based on these results, it could be preliminary concluded that the development of the FinTech industry in these countries is not yet sustainable enough.

Research Implications and Limitations

The pilot results of the study filled the existing information gap and preliminarily showed which SDGs and which SDG indicators are of the greatest importance for the sustainable FinTech industry development. Therefore, the pilot results as well as recommendations provided in this study are relevant and may provide a basis for further research and development in both theoretical and practical terms.

In a theoretical sense, the pilot results of the study showed that the relationship between FinTech industry development and sustainable development is not one-sided. The scientific literature to date has shown that the development of FinTech industry has a positive effect on the achievement of SDG indicators, but to date it has not been suggested that this may be reciprocal feedback. Accordingly, the results of the pilot study complement existing research and have shown that the link between the sustainable FinTech industry development and SDG indicators should be seen as a mutually reinforcing process, as sustainability is an all-encompassing and unifying goal.

From a practical point of view, the preliminary findings and recommendations of the study can be easily applied and integrated into the methodologies and action plans of national organizations, both to foster faster and smoother sustainable development of the FinTech industry and to achieve SDGs at the national level.

It should be noted that this study, as a pilot study, has a number of limitations. The first of the limitations is the low involvement of experts in assessing the importance of indicators. This passivity of experts is influenced by several factors. Only experts from Lithuania were invited to participate in this study. According to the Sustainable Development Ranking 2021, which shows the overall performance of all 193 UN Member States, Lithuania ranked 31st (Sachs et al., 2021), which is the worst result among the 15 European countries included in this study. It could therefore be argued that there is a shortage of experts in sustainable development in Lithuania. Accordingly, more research should be carried out in the near future, involving international experts from countries that are more advanced in the field of sustainable development.

The second limitation of the study is the lack of consistency of expert opinions, which could also be addressed by revising or expanding the list of experts. As the study aims to contribute to sustainable development at various levels (sustainable development of both FinTech industry and the economy), it should be identified which experts are best suited to this study, whether from business or the public sector. For this purpose, qualification coefficients for experts could be calculated (Gedvilaitė, 2019).

Further studies should also be extended by assessing whether the selected SDG indicators adequately reflect the real situation with the sustainable FinTech industry development in selected countries and beyond, considering the inclusion of additional indicators in the assessment of the sustainable FinTech industry development.

In summary, the study should be refined, supplemented and re-conducted in the near future in order to

achieve a more reliable result with a goal to contribute to the sustainable FinTech industry development, financial inclusion and the sustainable development of the economy.

Conclusions

By assessing the contribution of SDGs to the sustainable FinTech industry development, the pilot study preliminary established that SDG 8 "Decent Work and Economic Growth" has the biggest impact on the sustainable development of FinTech industry, followed by SDG 9 "Industry, Innovation and Infrastructure", SDG 4 "Quality Education" and SDG 16 "Peace, Justice and Strong Institutions".

By assessing the contribution of SDG indicators to the sustainable FinTech industry development, the pilot study preliminary established that the main driver for SDG 8 is adults with account at a financial institution, the main driver for SDG 9 is population using the internet, the main driver for SDG 4 is PISA score, and the main driver for SDG 16 is Corruption Perception Index.

The findings of multicriteria decision method Simple Additive Weighting (SAW) showed that Northern Europe is the most progressive in SDG achievement, related to the sustainable FinTech industry development, and therefore, is the most suitable European region for the sustainable FinTech industry development. Lithuania and Estonia are the most progressive in SDG 8 indicators, Denmark, Finland and Sweden are the most progressive in SDG 9 indicators, Finland and Denmark are the most progressive in SDG 16 indicators, with the only exception of France leading the way in SDG 4, however, followed by Lithuania in the second place.

The overall pilot ranking of sustainable development performance in terms of FinTech industry also confirmed the main preliminary conclusion with Lithuania taking the first place in the ranking, followed by Estonia, Denmark and Finland.

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