SUSTAINABLE BANKING AND ITS MAIN DETERMINANTS – EVIDENCE FROM THE SERBIAN BANKING SECTOR

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Abstract

Throughout the past decade, sustainability has been one of the most important topics among academics and within the business community. The adoption of ESG practice and the creation of holistic business models is on the agenda of the entire financial industry, predominantly among banking and investment entities. The paper aims to analyse the regulatory framework and current practice of sustainable business models with respect to the most important international banks operating within the Serbian economy. The analysis encompasses the descriptive assessment of ESG regulations, the reporting framework in the sustainability domain, and the quantitative analysis of ESG metrics and their statistical relationship with banks' financial performance. Due to various limitations, such as a lack of quantitative metrics and an unstandardized reporting practice, research was performed on a sample of four international banks operating in Serbia, for the period between the years 2015 and 2021. The statistical results of the regression analysis do not show a significant relationship between ESG metrics and the financial performance of the examined banks.

Key words: sustainability, finance and banking, ESG factors, Serbia.

ОДРЖИВО БАНКАРСТВО И ЊЕГОВЕ ОСНОВНЕ ДЕТЕРМИНАНТЕ НА ПРИМЕРУ БАНКАРСКОГ СЕКТОРА У СРБИЈИ

Апстракт

Одрживост је већ читаву деценију једна од најважнијих тема у академској и пословној заједници. Усвајање ЕСГ праксе и креирање холистичких пословних модела је на дневном реду целокупне финансијске индустрије, а нарочито унутар банкарских и инвестиционих институција. Рад има за циљ анализу регулаторног оквира и досадашње праксе одрживих пословних модела на узорку најзначајнијих

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међународних банака које послују у српској привреди. Анализа се састоји из дескриптивне оцене ЕСГ регулативе, оквира извештавања у домену одрживости, и квантитативне анализе ЕСГ индикатора и њиховог статистичког односа са финансијским перформансама банака. Услед многобројних ограничења, као што су недостатак квантитативних података и нестандардизована пракса извештавања, истраживање је спроведено на узорку који чине четири међународне банке које послују у Србији, за период између 2015. и 2021. године. Статистички резултати регресионе анализе не показују значајну везу између ЕСГ индикатора и финансијских перформанси банака.

Кључне речи: одрживост, финансије и банкарство, ЕСГ фактори, Србија.

INTRODUCTION

Despite the various systematic shocks related to the Covid-19 pandemic and its socio-economic aftermath, and the surging geopolitical conflicts, the existence of a strong and stable banking sector in Serbia is a solid reassurance, followed by the existence of constant and effective macro prudential measures and effective policies. The capital adequacy ratio, as one of the defining pillars of financial stability, is almost 3 times higher than the regulatory threshold (22.4% versus 8%), while simultaneously preserving the high quality of assets in the banking portfolio. Non-performing loans (NPL) have been experiencing a significant downtrend in the last 7 years, recording a historical low in 2020 by making less than 4% of the overall credit portfolio (National Bank of Serbia - NBS, 2022). Given the bank-centric nature of the domestic financial system, where the banking sector comprises more than 90% of overall financial assets (NBS, 2022), it is of great importance to systematically continue with the prudent supervision and preservation of financial stability and the overall health of the financial industry. There are 22 banks in the Serbian financial system[1] (21 traditional and 1 virtual), predominantly owned by foreign international banking groups headquartered in the European Union and characterised by a concentrated structure – the largest ten banks own 82% of the market share in total assets. Currently, there is an accelerating trend of consolidation in the Serbian banking industry, with several merges and acquisitions taking place, or being planned for the upcoming period.

The aim of this paper is to assess the practice of sustainable business among major banks (on group level) operating in the Serbian banking sector. The growing concern about climate change and its widespread consequences has emphasised the need to change business perspectives, and to shift the focus of businesses from the solely financial to the holistic, including the incorporation of sustainable and responsible aspects of banking performance. In that regard, there is an urgent need to factor non-

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[1] This is true of the period during which this paper was written.

financial metrics into overall business performance. By their nature, climate risks can be considered systemic risks from the perspective of the financial system as well, with physical and transitional risk facets being directly involved. The banking sector, for instance, is indirectly exposed to physical and transitional climate risks, through loans to businesses and households. The impact of climate risks on the banking sector is twofold: on the one hand, climate risks are manifested through effects on the credit quality of clients, which is the value of the banks' assets, and on the other hand, climate risks are manifested through effects on the value of the received collateral. Given that the credit activity of banks in Serbia is their main business and profit generator, with the credit portfolio comprising almost two-thirds of the total banking assets, it is clear that there is need for more prudent risk management with respect to environmental considerations.

The paper is organised as follows. The introductory part is followed by a section giving a general overview of the concept of sustainability and its practice in the banking industry which is, in turn, followed by a section dedicated to a literature review. Research methodology, and research results and their discussion comprise the next two sections. The final section of the paper is concerned with the concluding remarks and considerations for further research.

OVERVIEW OF SUSTAINABLE BANKING

Bearing in mind the various environmental problems associated with raising the standard of living of the world's population, in 1983, the United Nations (UN) General Assembly convened the World Commission on Environment and Development (WCED), an international group of environmental experts, politicians and civil servants. The WCED (known as the Brundtland Commission) was in charge of proposing long-term solutions with the aim of achieving sustainable development. As a result, the Commission published the Brundtland Report (known as Our Common Future) in 1987, which introduced the concept of sustainable development and suggested ways in which it could be accomplished. The report set down the principles for the Rio de Janeiro Earth Summit held in 1992 (CFA Society UK, 2021). The Summit specified the functions of business and industry in the sustainable development agenda[2]. According to the Rio Declaration, businesses have a responsibility to ensure that activities within their own operations do not cause damage to the environment, as businesses gain their rights through meeting the needs of society.

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[2] It was the basis for the establishment of UN Sustainable Development Goals (SDG) in 2015.

It can be said that the foundations of modern, responsible investment can be found in the Rio Summit (UN, 2022).

The early phase of environmental, social and governance (ESG)[3] investing is related to social responsible investment (SRI), i.e. investing in companies or industries which do business in accordance with holistic values, which are not solely related to financial performance. Later on, it became important for investors to take into consideration ethical issues of a social nature and environmental issues. The main differences between early and modern SRI are the increase in shareholder activism, and a more disseminated respect for environmental factors and investment in positive-screening, which enhance financial returns and better risk management within a socially aligned investment strategy. Accordingly, SRI finally connects ESG factors into a traditional investing framework centred only on achieved/expected profit and risk-adjusted returns.

The modern form of ESG investment began in 2004, when representatives of the UN invited the CEOs of major financial institutions to take part in the action of UN Global Compact (UNGC) and the International Finance Corporation, based on the integration of ESG into capital markets. The result of this initiative was a report called *Who Cares Wins*, which introduced the term 'ESG' (UN Department of Public Information, 2004). The report confirmed that the incorporation of ESG factors into capital markets produces more valuable business meanings, and leads to more sustainable markets and overall better results for societies. Simultaneously, the UN Environment Programme Finance Initiative (UNEP FI; 2005) produced the Freshfields Report, which found that ESG issues are relevant for financial valuation and, accordingly, for the operation of financial markets. The aforementioned reports supported the introduction of the Principles for Responsible Investment (PRI) at the New York Stock Exchange in 2006, and the Sustainable Stock Exchange Initiative in 2007. It should be emphasised that UNEP FI introduced a framework which includes: 1) Principles for Responsible Investment; 2) Principles for Sustainable Insurance, and 3) Principles for Responsible Banking (PRB). Accordingly, the PRB is a unique framework for ensuring that the signatory banks' strategies and practices align with the vision society set out for its future in the SDG and the Paris Climate Agreement.

Aracil, Najera-Sanchez and Forcadell (2021) defined sustainable banking as the delivery of "financial products and services, which are developed to meet the needs of people and safeguard the environment while

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[3] There is no universal standard for E, S and G issues. The understanding depends on the stakeholder point of view. However, it can be said in general that: 1) E factors pertaining to the natural world, 2) S factors affect the lives of humans, 3) G factors that involve issues tied to countries and/or jurisdictions, or are common practice in an industry; as well as the interest of broader stakeholder groups (CFA Society UK, 2021).

generating profit" (Yip & Bocken, 2018, p. 150). Sustainable banking (Jucken, 2004/2010) and related terms, such as banks' Corporate Social Responsibility (CSR), ethical banks (Birindelli, Forretti, Intonti, & Iannuzi, 2015; San-Jose, Retolaza & Gutierrez-Goria, 2011), eco-banking, and green-banks (Bahl, 2012; Bouma, Jeucken & Klinkers, 2017) have been analysed extensively, as they play a crucial role in fostering sustainable development.

Having in mind the importance of the topic, Stefanović, Bar-jaktarović and Bataev (2021) analysed the digitainability (simultaneously focused on digitalisation and sustainability initiatives) and the profitability of the local sector in the period between 2011 and 2020 on a sample of 25 banks. This research revealed that 60% of the Serbian banking sector is characterised by digitainability, and that 80% of the sample has a positive ROE. With respect to the banks' digitainability, it can be noticed that three out of four banks (Banca Intesa, UniCredit and Raiffeisen) are ranked in the first top ten banks on the Serbian market, while the last one (ProCredit) is ranked 13th (Table 1). Furthermore, the first three banks have better performances in profitability (ROA ranged between 1.3% and 1.9%), as compared to the average of the Serbian banking sector (ROA 1.2%). Moreover, their profitability results are better than the consolidated group performance (ROA ranged between 0.2% and 0.99%, and ROE ranged between 2.9% and 10.6% in 2021). Finally, the ProCredit bank displays a positive development of business, but its profitability (ROA 0.44% and ROE 3.89%) is lower compared to the consolidated group results (ROA was recorded to be 0.97%, and ROE was recorded to be 9.7% in 2021).

Table 1. Basic financial information on the analysed/relevant sample of Serbian banks at the end of 2021

Banks/ Indicators	Market share (%)			ROA (%)	ROE (%)	Cost/ income ratio (%)
	Assets /ranking/	New Loans	Deposits			
Banca Intesa a.d. Belgrade	14.8 /1/	15.4	16	1.4	9.1	60
UniCredit bank Serbia a.d. Belgrade	10.7 /3/	10.55	10.7	1.3	7.9	56
Raiffeisen bank a.d. Belgrade	8.6 /5/	7.4	10.2	1.9	14.1	53
ProCredit bank a.d. Belgrade	3.1 /13/	2.96	3.1	0.44	3.89	81
Average of the Serbian banking sector				1.2	8.0	n/a

Source: Authors' calculations on the basis of data available on the site of the NBS

It is important to emphasise that all of the banks in the sample have the relevant ESG data on their websites (more in the methodological part), and that their quality is relevant for further analysis (Mijokovic, Knezevic, & Mizdrakovic, 2020). In terms of environmental loans, three of the banks (Banca Intesa, UniCredit and ProCredit) offer energy effi-

ciency loans, while Raiffeisen offers loans for the digitalisation of businesses and the introduction of innovative products (Table 2). Furthermore, all of them are socially responsible and have received the VIRTUS award.

Table 2. ESG factor information on the analysed/relevant sample of Serbian banks

Banks	Environmental	Social	Governance	Digitainability& profitability	Comment
Banca Intesa a.d. Belgrade	+	+	+	+	Loans for energy efficiency; VIRTUS award;
UniCredit bank Serbia a.d. Belgrade	+	+	+	+	Loans for energy efficiency; VIRTUS award;
Raiffeisen bank a.d. Belgrade	+/-	+	+	+	Loans for digitalization of business and introduction of innovative products; VIRTUS award;
ProCredit bank a.d. Belgrade	+	+	+	+	Loans for energy efficiency; VIRTUS award;

Source: websites of analysed banks (Stefanovic et al., 2021)

If we analyse the banking groups' overall results, we can notice that all of the banks displayed a positive development of business, in accordance with the overall situation on the global market. Moreover, all banking groups have a higher CET1 ratio and higher leverage indicator values than is required by regulation. Furthermore, UniCredit has the best profitability (ROA, ROE, net income and net interest income) and NPL indicators. In terms of environmental loans, the UniCredit group is the leader, followed by the Intesa SanPaolo group, Raiffeisen Bank International, and the ProCredit group. It can be concluded that green projects are becoming increasingly important (Stojkovic, Jovanovic-Kranjec & Lukovic, 2021).

All of the aforementioned banking groups stress the fact that annual reports, consolidated financial reports, and consolidated non-financial reports are part of the integral reporting package. Their ESG reporting package consists of ESG ratings, or the following: 1) the environmental supply chain, which includes biodiversity, climate change, pollution and resources, and water security; 2) the social supply chain, which covers labour standards, human rights and community, health and safety, and cus-

tomer responsibility; and 3) the governance supply chain, which takes care of anti-corruption, corporate governance, risk management, and tax transparency.

The reports of the analysed banking groups differ in the manner in which they present their results to stakeholders (for example, the name of the environmental credit product and way of presenting the structure, purpose or beneficiary, terms which are used for donations and investments etc.), and in the process of adopting and implementing strategies.

LITERATURE REVIEW

Bearing in mind that the Serbian financial sector is bank-centric, there is a great need for this industry to accomplish SDG, due to the fact that they are the main intermediaries for the collection and placement of financial resources meant to achieve impact on the whole of society (Alexander, 2014; Beck, Demirgüç-Kunt & Levine, 2010; UN, 2015). For example, green loans impact the decrease of carbon emissions, which ensures the achievement of SDG ('double carbon' goal, whose climate goal is to reduce carbon emissions by 2030, and reach carbon neutrality by 2060). In other words, green credit can inhibit carbon intensity by promoting industrial structure upgrading, technological innovation, and signal effect (Hu & Zheng, 2021). Furthermore, different external factors such as the world economic crisis of 2008 (Mattila, Hanks & Kim, 2010; Ruiz & Esteban, 2014), the Fourth Industrial Revolution (Schwab, 2017), and the Covid-19 pandemic (Association of Serbian Banks-ASB, 2021) have had an impact on the banking industry's business model i.e. digitainability (Lichtenthaler, 2021; Sa, Santos, Serpa & Ferreira, 2021; Stefanovic et al., 2021). Sustainable banking (Jucken, 2004/2010) and related terms such as banks' Corporate Social Responsibility (CSR), ethical banks (Birindelli et al., 2015; San-Jose et al., 2011), eco-banking, and green-banks (Bahl, 2012; Bouma, Jeucken & Klinkers, 2017) have been analysed extensively, as they play crucial roles in fostering sustainable development.

Hu and Zheng (2021) mention that, in different research, authors use similar concepts such as sustainable finance, environmental finance, climate finance and green finance instead of the concept of green credits. In their study, Zhang, Wang, Zhong, Yang and Siddik (2022) discovered that an increase in banks' competitiveness, a reduction in long-term costs and expenses, the creation of online banking facilities, the improvement of customers' goodwill, and the reduction of a bank's carbon footprint are the key benefits of green banking development, as it helps in the achievement of a country's sustainable economic development. Furthermore, empirical results (Buallay, 2018) demonstrated that ESG significantly and positively impacts the performance of the European banking

sector. Moreover, European policy makers have increased their efforts in creating a regulatory framework which would improve sustainability in the financial system. The legislative framework is currently being enriched by policy makers and regulators who are carefully pursuing the objective of a more sustainable economic system in which financial institutions may act as catalysts (Bruno & Lagasio, 2021).

Aracil et al. (2021) did a comprehensive review which organises the literature within the field of sustainable banking. They made a representative sample of 676 studies (published in the period between 1995 and 2019) from WoS's SSCI database. The sample matches searches related to, among others, the key phrases 'sustainable bank', 'ethical bank', and 'corporate social responsibility', in combination with the term 'finance sector/industry'. Their findings are related to:

1) Sustainable banking research trends, and their evolution over time and across WoS categories and journals – a) papers on sustainable banking used to be published more often in Business, Economics, and Management journals than in mainstream Financial journals; b) papers on sustainable banking increasingly cover a range of environmental topics compared to business and ethics; and c) the crises caused by economic developments (in 2008) and the Covid-19 pandemic (2019-present) refreshed the research of sustainable banking;

2) Sustainable banking literature, and its integrative framework – a) this literature and its framework were built on three conceptual pillars, i.e. Ethical Foundations, Financial Products and Business-Case; b) the themes covered in this literature have changed from customer-experience to banks' contributions to environmental care; and c) it is expected that the publication of papers on sustainable banking will increase, specifically in the clusters of 'Microfinance', and 'SRI and green banking'; and

3) Links across domains and clusters, moving toward the convergence of instrumental and ethical perspectives in sustainable banking – a) this literature shows an increasing trend of covering the synergetic fit between customer experience and financial performance which considers questions of ethics; and b) microfinance and financial inclusion are important topics for different states, taking into consideration the normative or ethical aspects of sustainable banking.

Based on previous findings, we can observe that this research mainly follows the previously described trend, as it is categorised under the scope of journals on economy. It covers banking products, the impact on the environment, and the financial performance of key digitainability players in the Serbian banking market. Finally, this is the first study which takes into consideration the ESG elements of dominant financial

institutions in the Serbian banking industry, with an extensive analysis of the subject's regulatory framework.

METHODOLOGY

Analysing sustainable practice in the banking industry in Serbia based on various financial and non-financial reports was challenging due to the lack of, predominantly, quantitative and universally accepted metrics. In the Serbian banking sector, only three banks were found to have appropriate non-financial reports, although with descriptive elements: Banca Intesa a.d. Belgrade (2010-2019), Erste bank a.d. Novi Sad (2008-2020) and "3 bank" a.d. Novi Sad (2020). Further screening led to the discovery that several banking groups have those reports (with both quantitative and qualitative elements): 1) Intesa SanPaolo (2003-2021), 2) UniCredit (2001-2021), 3) Raiffeisen International Bank (2004-2021; where data related to the environmental credit portfolio exists starting with the year 2015), 4) Erste (2021), 5) NLB (2020), and 6) ProCredit (2013-2021). Finally, in order to have a unified time series, ranging between 2015 and the end of 2021, and in order to secure comparative data for environmental loans, the reduction of CO_2, and community donations, only four banking groups were taken into consideration in this research: Intesa SanPaolo, UniCredit, Raiffeisen International Bank, and ProCredit.

Given the fact that traditional lending and the interest rate differential are the most important sources of profit for the entire banking sector in Serbia (even in the decade-long low interest rate environment), we observed *environmental loan* as our main dependent variable, along with several financial and non-financial metrics, which represented independent variables. The reduction in CO_2 emissions and community investments were added to the analysis, among other ESG-related metrics, whereas the standard financial metrics included in the analysis, reflecting proxies for different business aspects, were ROE and net income (profitability), leverage (solvency), ratios of common equity capital and NPL (financial stability), and cost-to-income ratio (efficiency). In order to get a more normalised dataset, we transformed three absolute indicators pertaining to ESG into logarithmic values.

When it comes to traditional financial metrics, official financial statements and annual reports of the four aforementioned banks (on a consolidated level) were used as data sources. For ESG-related data, there is no unified source of information; they are a rather integral part of the broad ESG framework, which includes several sets of reports and regulations, as shown in Table 3.

Table 3. ESG data on the group sites of the analysed banks

No	Banking group	ESG data
1	Intesa SanPaolo	TCFD Report (parts: governance, strategy, risk management, metrics & targets); Sustainable reports (until 2016); Consolidated non-financial reports (2017-2021); ESG culture; Managing of ESG and Reputational Risk; CFO responsibility; Business plans and ESG plans for following periods: 2014-2017; 2018-2021; 2022-2025; Relevant regulation such as: TCFD, SAASB, UN Global Agreement and SDG, Equator Principles, WEF principles, UNEP FI- principles of responsible banking; GRI; Net Zero Banking Alliance; CDP; CSR governance; Ethical codes, good practices of sustainability, responsible financial investments; new products contribute do the decreasing impact on society ; EU Taxonomy regulation, EBA regulation
2	UniCredit	TCFD Report(parts: governance, strategy, risk management, metrics & targets); Integrated reports; Sustainable reports; Chief Sustainable Officer – on the group level; ESG principles include business model (creating value for stakeholders), governance, strategy, risk management, matrices & targets; Relevant regulation such as: TCFD, UN Global Agreement and SDG; Equator Principles, GRI; CDP (Carbon Disclosure Project); Net Zero Banking Alliance; EBA regulation;
3	Raiffeisen Bank International	TCFD(parts: governance, strategy, risk management, metrics & targets); Sustainable reports; Impact report; Sustainable committee; Group ESG & Sustainable Management; Responsible banking standard groups; Sustainable Finance Manager; Sustainable structure: responsible banker, fair partner and engaged citizen; GRI standards; CDP; Regulatory disclosure; EBA regulation;
4	ProCredit	Reporting package: Annual reports, Appendix, Disclosures; Non-financial reports; PCB Impact report, Results presentations; Group approach related to Environmental Strategy, Environmental Policy, Managing the environmental and social risk lending (holistic approach to credit risk);Greening ProCredit Guide; Business, Ethics and Environmental standards (plastic strategy, code of conduct, ProCredit impact package report; group environmental management); Group Environmental Management and Reporting Team, Environmental Committee; ESG Pillars: 1) Integrated Environmental system, 2) Managing of environmental and social risk in lending; Green finance /Green credit services (they monitor environmental performance); Relevant regulation: UN SDG, Responsible banking in practice; Partnership for carbon accounting financials (PCAF), GRI context; Performance in accordance with the regulation such as: GRI standards, European NFRD, UNSDG, UN Global Compact, UNEPFI - principles of responsible banking and PCAF; EBA regulation;

Source: sites of analysed banking groups (April, 2022)

Correlation and its significance for all of the selected variables during the study period will be determined. Regression analyses will be applied, with environmental loans and profitability proxies being tested separately as the dependent variables, and other ESG and financial metrics serving as independent variables.

RESULTS AND DISCUSSION

The main findings informed by the results of our analysis are given in this section. To begin with, basic descriptive statistics are presented in Table 4.

Table 4. Descriptive statistics for research variables

	ln_Net Income	ROE	Cost/ Income ratio	NPL	Leverage	CET 1 ratio	ln_Comm Invest	ln_tCO2 Red.	ln_Env. Loans
Mean	2.96	7.81	58.91	2.93	12.48	13.38	0.82	4.47	3.33
Standard Error	0.15	0.49	1.36	0.39	0.49	0.25	0.20	0.12	0.09
Median	3.16	7.60	56.45	2.48	12.70	13.60	1.10	4.42	3.26
Standard Deviation	0.77	2.59	7.22	2.08	2.61	1.35	1.06	0.65	0.47
Sample Variance	0.60	6.71	52.09	4.33	6.82	1.81	1.12	0.42	0.22
Kurtosis	-0.88	-0.62	-0.85	1.05	2.46	0.49	-1.30	-1.31	-0.49
Skewness	-0.73	0.19	0.74	1.11	1.13	-0.79	-0.48	0.41	0.11
Range	2.45	9.80	22.90	8.30	12.25	5.40	3.17	1.80	1.89
Minimum	1.62	2.90	50.80	0.30	8.60	10.00	-0.90	3.74	2.42
Maximum	4.07	12.70	73.70	8.60	20.85	15.40	2.27	5.54	4.31
Count	28	28	28	28	28	28	28	28	28

Source: Authors' calculations

According to expectations, all of the logged data indicators show less variation and standard error, contrary to the results for conventional financial indicators. The highest standard deviation, by far, can be observed in cost-to-income ratio, demonstrating the different approaches of the sampled banks with respect to efficiency features and operating management. Solvency results, demonstrated through the leverage indicator of the sampled banks, also differ substantially from each other. Variation is also high with respect to the profitability ratio of banks, where the ROE metric ranges between 2.90% and 12.70%. This is contrary to the results of net income, which show a significantly lower standard deviation.

Almost half of the variables feature nearly symmetrical distribution, with the skewness ranging between -0.5 and 0.5. On the other hand, the results for NPL and Leverage show a significantly positive skewness (1.11 and 1.13, respectively). Kurtosis results demonstrate a flatter than normal distribution for all variables.

There are several important findings with respect to correlation analysis. Firstly, when we observe three metrics related to ESG practice, we can see that the correlation is strong and positive in all pairs, circulating around the value of 0.70 (Table 5). This might imply a holistic approach to ESG business practice, wherein the social component, represented through the community investments indicator, cannot be detached from the overall approach. Community investments also exhibit an almost perfect positive correlation with net income, demonstrating the importance of the relationship between the industry's profitability and CSR, which is consistent with the findings of Taliento, Favino and Netti (2019), and Buallay (2018). Conversely, there is a strong negative relationship

between community investments and cost-to-income ratio, which implies an important cost-management and efficiency approach. Secondly, there is a substantial difference in comparing two profitability metrics with the ESG indicators. ROE, as the main proxy for the banks' profitability, shows no significant association with the chosen ESG indicators, whereas net income has the opposite results.

Table 5. Correlation matrix - pairwise

Variables	ROE	ln_Net Income	Cost/ Income ratio	NPL	Leverage	CET 1 ratio	ln_Comm Invest	ln_tCO2 red.	ln_Env. Loans
ROE	**1**	0.066	-0.034	0.098	-0.270	0.003	-0.158	-0.269	-0.179
ln_Net Income	0.066	**1**	**-0.821**	**-0.453**	**0.745**	0.024	**0.935**	**0.611**	**0.717**
Cost/Income ratio	-0.034	**-0.821**	**1**	**0.466**	-0.344	-0.257	**-0.825**	-0.281	**-0.530**
NPL	0.098	**-0.453**	**0.466**	**1**	-0.368	**-0.516**	**-0.462**	**-0.399**	**-0.649**
Leverage	-0.270	**0.745**	-0.344	-0.368	**1**	-0.166	**0.764**	**0.763**	**0.673**
CET 1 ratio	0.003	0.024	-0.257	**-0.516**	-0,166	**1**	0.068	-0.180	0.153
ln_Comm Invest	-0.158	**0.935**	**-0.825**	**-0.462**	**0.764**	0.068	**1**	**0.687**	**0.699**
ln_tCO2 red.	-0.269	**0.611**	-0.281	**-0.399**	**0.763**	-0.180	**0.687**	**1**	**0.694**
ln_Env. Loans	-0.179	**0.717**	**-0.530**	**-0.649**	**0.673**	0,153	**0.699**	**0.694**	**1**

Values in bold are different from 0 with a significance level alpha=0.05; source: Authors' calculations

Given the fact that interest income is, by far, the largest contributor to the banks' overall profits, the need to properly address the credit risk of the institution is great. In order to encourage institutions to offer a greater number of environmental loans, offering financial incentives and governmental subsidies in different formats is a widespread practice (Jin, Ding & Yang, 2022; Mazzucato & Semieniuk, 2018; Polzin, Migendt, Täube & Flotow, 2015), and this practice exemplifies a more secure credit portfolio and mitigation of default risk. Therefore, a negative relationship exists between the size of the environmental portfolio and non-performing loans, confirming the risk reduction practice.

The significance of NPL, as a credit risk metric, can be confirmed through the results of the regression analysis as well, wherein the environmental loans indicator was taken as a dependent variable (Table 6). Furthermore, the other two ESG indicators also show statistical significance (Table 7), with p-values less than 0.05. The overall model fits the data, with a high F-value and a high coefficient of determination. Other financial metrics do not exhibit any statistical significance.

Table 6. Model summary and ANOVA results for environmental loans as dependent variable

Multiple R	0.93124809				
R square	0.86722301				
Adjusted R square	0.81131691				
Standard Error	0.20420385				
Observations	28				
ANOVA	df	SS	MS	F	Significance F
Regression	8	5.17475065	0.64684383	15.5121351	8.0129E-07
Residual	19	0.79228505	0.04169921		
Total	27	5.9670357			

Table 7. *Coefficients for environmental loans as dependent variable*

	Coefficients	Standard Error	t stat	P-value	Lower 95%	Upper 95%
Intercept	5.4515	1.6563	3.2913	0.0038	1.9848	8.9183
ROE	-0.0084	0.0226	-0.3711	0.7146	-0.0556	0.0389
ln Net Income	0.0109	0.2660	0.0408	0.9679	-0.5459	0.5676
Cost/Income ratio	0.0163	0.0203	0.7995	0.4339	-0.0263	0.0588
NPL	-0.0870	0.0275	-3.1642	0.0051*	-0.1446	-0.0295
Leverage	0.0317	0.0531	0.5971	0.5575	-0.0795	0.1430
CET 1 ratio	-0.0068	0.0404	-0.1679	0.8684	-0.0913	0.0777
ln Comm Invest	0.4154	0.1907	2.1788	0.0421*	0.0163	0.8144
ln tCO2 Red.	-0.8259	0.1743	-4.7381	0.0001*	-1.1907	-0.4611

95% confidence interval; source: authors' calculations

The second and third model include profitability metrics – net income and ROE respectively – as dependent variables. Despite being very robust and fitting (with the adjusted R square value of almost 95%, as shown in Table 8), regression with net income as a dependent variable does not show the statistical significance of any of the three ESG-related indicators, as their p-values are much higher than 0.05. On the other hand, financial metrics like leverage, ROE, and cost-to-income ratio show statistical significance (Table 9).

Table 8. Model summary and ANOVA results for net income as dependent variable

Multiple R	0.98182182				
R square	0.96397409				
Adjusted R square	0.94880528				
Standard Error	0.17510273				
Observations	28				
	df	SS	MS	F	Significance F
Regression	8	15.5879777	1.94849721	63.5497662	4.419E-12
Residual	19	0.58255835	0.03066097		
Total	27	16.170536			

Table 9. Coefficients for net income as dependent variable

	Coefficients	Standard Error	t stat	P-value	Lower 95%	Upper 95%
Intercept	3.33247932	0.99805026	3.33898947	0.00344849	1.24353611	5.42142252
ROE	0.06301683	0.01387687	4.54114117	0.00022334*	0.0339722	0.09206145
Cost/Income ratio	-0.0572011	0.0201427	-2.8397922	0.0104735*	-0.0993603	-0.0150419
NPL	0.0266149	0.02860656	0.9303773	0.36384702	-0.0332593	0.08648912
Leverage	0.13060267	0.03929813	3.3233815	0.00357206*	0.04835075	0.2128546
CET 1 ratio	-0.010652	0.03711722	-0.2869827	0.77723184	-0.0883392	0.06703523
ln Comm Invest	0.08362766	0.19498499	0.42889279	0.67282475	-0.3244806	0.49173592
ln tCO2 Red.	0.0625777	0.13180929	0.47475937	0.64036987	-0.2133023	0.33845772
ln_Env. Loans	0.17882884	0.13799026	1.29595265	0.21051431	-0.1099881	0.46764577

*95% confidence interval; source: authors' calculation

This model is even less fitting when it comes to using ROE as a dependent variable, with the adjusted R^2 equalling only 0.40, and the F-statistics equalling 3.26. Akin to the previous model, none of the ESG indicators show a statistical significance, with p-values much higher than the threshold.

Table 10. Model summary and ANOVA results for ROE as dependent variable

Multiple R	0.76065803				
R square	0.57860063				
Adjusted R square	0.40116932				
Standard Error	2.00462618				
Observations	28				
	df	SS	MS	F	Significance F
Regression	8	104.834789	13.1043486	3.2609838	0.01638272
Residual	19	76.3519966	4.01852614		
Total	27	181.186786			

Table 11. Coefficients for ROE as dependent variable

	Coefficients	Standard Error	t stat	P-value	Lower 95%	Upper 95%
Intercept	-16.02276	13.9156943	-1.1514165	0.2638448	-45.148643	13.1031227
ln Net Income	8.25919066	1.81874783	4.54114117	0.00022334*	4.4525077	12.0658736
Cost/Income ratio	0.38102191	0.2609701	1.46002131	0.16062229	-0.1651948	0.92723862
NPL	-0.2136782	0.33126559	-0.6450359	0.52661674	-0.9070251	0.47966864
Leverage	-1.0827899	0.50829154	-2.1302536	0.04643859*	-2.1466563	-0.0189235
CET 1 ratio	0.00112267	0.42584844	0.00263631	0.99792401	-0.8901884	0.8924337
ln Comm Invest	-1.3068011	2.22289785	-0.5878818	0.56353446	-5.9593798	3.34577756
ln tCO2 Red.	-0.5846779	1.51197651	-0.3866978	0.70327678	-3.7492811	2.57992528
ln_Env. Loans	-1.5875649	1.60734693	-0.9876928	0.33571515	-4.9517807	1.77665084

CONCLUSION

Given the Fintech Revolution and the diffusion process taking place, financial intermediation through traditional and newly created channels will become increasingly important for all the participants in modern financial systems. As one of the founding pillars of global financial infrastructure, international banks and the investment industry are expected to lead by example and be proactive initiators of changes in business paradigms. Therefore, it is crucial to incorporate ESG practice and various subject-related indicators into a holistic and sustainable model, which would be beneficial for all (in-)direct stakeholders. The adoption of ESG practice and working towards the sustainability of business have become the most prioritised tasks among regulators and legislative bodies; they represent unavoidable considerations in the process of making financing and investing decisions. For example, in 2020, in his annual letter to chief executives, Larry Fink, the CEO of BlackRock, stated that the investment firm would intensify its consideration of climate change during its investment considerations, because it was reshaping the world's financial system by removing companies that generate more than 25% of their revenues from coal production from its actively managed portfolio (Fink, 2020).

The topic of this research is relevant, especially if one bears in mind the fact that the Serbian financial market is bank-centric. The major banking players (on group level: Banca Intesa, UniCredit, Raiffeisen and ProCredit) are committed to digitainability. At the same time, they are profitable and their business performances influence the environmental, and social and good-practice governmental issues. All banking groups state, in a transparent manner, that their annual reports, consolidated financial reports, and consolidated non-financial reports are part of the integral reporting package.

The objective of this research was to analyse different ESG-related metrics in relation to the banking players dominant in the Serbian econo-

my, as well as to show the association between ESG metrics and the banks' financial performance. Several findings obtained through correlation analysis proved that the sustainability of the banks' businesses is significantly inter-connected with ESG constituents, and with some of the selected financial metrics. The results of the regression analysis showed the statistical significance of ESG metrics for environmental loans; however, similar findings are absent when it comes to the association between financial performance (in terms of profitability) and ESG practice. The main limitation of this study is the small research sample. The size of the research sample is a consequence of the heterogeneous regulatory framework, a lack of relevant data and reports for banking entities operating solely in Serbia (which is why we used data on the group level), and the inability to standardize the ESG metrics for quantitative analysis. However, this represents the first study of its kind in the Serbian financial industry. With a faster and broader introduction of ESG practice into national legislature and business practice, more research opportunities are expected to open up in this subject field, with more relevant data available across the industry, and with an improved and more transparent reporting practice.

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ОДРЖИВО БАНКАРСТВО
И ЊЕГОВЕ ОСНОВНЕ ДЕТЕРМИНАНТЕ
НА ПРИМЕРУ БАНКАРСКОГ СЕКТОРА У СРБИЈИ

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Резиме

Одрживо пословање подразумева холистички приступ обављању привредне делатности који, поред основних финансијских циљева и пареметара, подразумева и уважавање ЕСГ принципа и фактора насталих као последица субоптималних ефеката привређивања на друштвену и природну заједницу. Имајући у виду важност финансијских институција у савременој економији, неопходно је анализирати и концепт одрживости пословања представника исте. Финансијски систем Србије је у највећој мери детерминисан пословањем комерцијалних банака, претежно чланица међународних банкарских групација. Као такве, банке имају посебан значај у усвајању одрживог банкарског пословања, заснованог на еколошким и друштвеним принципима. Интермедијарна улога банкарског сектора има свој шири друштвено-економски утицај, који се огледа и у значају еколошке одрживости.

Банкарски сектор у Србији је високо капитализован, ликвидан и са ниским степеном кредитног ризика. Међутим, и поред повољних финансијских резултата, концепт одрживог банкарства је у нашој земљи на самом зачетку. Таква позиција се манифестује, пре свега, у одсуству стандардизованог регулаторног оквира у погледу нефинансијског извештавања, као и при недостатку довољног броја квантитавних индикатора одрживог пословања. Поред чињенице да банке у Србији наглашавају свеобухватни приступ у извештавању, који подразумева годишњи извештај о пословању, те консолидоване финансијске и нефинансијске извештаје, постоји значајна разлика у категоризацији активности и формату њиховог презентовања. Имајући то у виду, свега четири банке које послују у Србији имају три заједничка ЕСГ параметра које је могуће користити у даљој анализи.

Квантитативна анализа је обухватила период између 2015. и 2021. године, као и податке четири банкарске групације које послују у Србији: Банка Интеза, Уникредит, Рајфајзен и Прокредит. Поред стандардних финансијских индикатора профитабилности, солвентности, оперативне ефикасности и мере ризика, у истраживању су коришћена три ЕСГ индикатора: обим еколошких („зелених") кредита, друштвено прихватљива улагања, и обим смањења емисије угљен-диоксида. Регресиона анализа није утврдила статистичку значајност ЕСГ фактора за мере профитабилности, док је, с друге стране, уочена међусобна повезаност ових фактора, што демонстрира интегративни приступ свим чиниоцима одрживог банкарства.