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Nexus between sustainability and financial performance in the Serbian banking sector

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Abstract:

Research Question: The paper investigates various ESG (Environmental, Social and Governance) related practices within the leading European banking groups (BGs) present in Serbian banking sector (SBS), including their financial performances. **Motivation:** The goal of the research was to explore approach habits to sustainable business between the leading European BGs present in the SBS. It should have in mind that SBS are in compliance with their headquarter/major shareholder. The rising global worry about ESG issues and its overall impact forces banking business model to use holistic approach, including the plug-in of sustainability and responsible behaviours. The paper draws on sustainable banking surveys of Aracil et al. (2021) and Stefanovic et al. (2021) in Business-Case domain, applying them on SBS with introduction of 3 comparable sustainable indicators (environmental loans, reduction of tCO2, community investments). It is the first study which takes in respect ESG elements of principal BGs in SBS, with the comprehensive analysis of subject's legislative framework. **Idea:** The core idea of the paper was to empirically investigate the sustainable practice in SBS, based on different banks' reports and publications, including disclosed ESG indicators. E-loans (EL) and profitability indicators were examined individually as dependent variables since other ESG and financial (solvency, financial stability and efficiency) variables served as independent ones. **Data:** Analysis was conducted using data of 4 European active BGs on SBS, in the period of 2015-2021, due to fact that there was the lack of quantitative metrics and non-uniform reporting practice. **Tools:** Statistical analysis (descriptive statistics, correlation, regression test utilizing ANOVA), were used to draw conclusions about the relationship variables, particularly correlation between ESG variables and profitability ratios. **Findings:** The study showed for analyzed BGs that: (1) they had unique ESG practice, based on global standards and EBA (European Banking Authority) regulation; (2) they had good credit risk management including E-risks in practice; (3) sustainability had significant inter-connectedness among ESG constituents, as well as with some of the financial metrics; (4) statistical significance of ESG metrics for EL; however similar findings are missing when it comes to association between financial performance (in terms of profitability) and ESG practice. **Contribution:** The paper introduces and expands existing research related to sustainable banking on SBS for further education of all stakeholders.

Keywords: banking, ESG, sustainability, financial performance

JEL classification: G21, G32, F64, F65

1. Introduction

Despite the global crisis combined with inherited issues from pandemic period and the Russia-Ukraine conflict, it can be said that SBS is strong and stable, accompanied with properly applied macroeconomic measures. Accordingly, the first pillar of financial stability - capital adequacy ratio, is almost 3 times higher than regulatory minimum (22.4% vs 8%), at the same time keeping solid performance of the banking credit portfolio. Furthermore, non-performing loans (NPL) have decreasing course since 2015, where the historical minimum was less than 4% in 2020 (NBS, 2021). Finally, it should be emphasized that Serbian financial sector is the bank-centric (more than 90% of financial assets are created by banking sector) (NBS, 2022). Therefore, in order to keep much-needed financial stability of Serbian economy, it is necessary to continue with the prudent supervision.

Currently, the SBS constitutes 22 banks prevalently owned by foreign European BGs which headquarters are located in the European Union, with the concentrated structure – top ten banks constitute 82% of market

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share in the terms of total assets (NBS, 2022). Moreover, according to (Stefanovic et al., 2021) it can be noticed that SBS has characteristics of digitainability and 80% of them have positive return on equity-ROE. According to Lichtenthaler (2021) digitainability: 1) is an innovation-driven approach to create framework for merging digitalization and sustainability in firms' strategic initiatives in order to generate additional profit; 2) provides a possibility for cross-fertilization result of both digitalization and sustainability. Furthermore, digitainability focuses on digitally sustainable societies (Sa et al., 2021). Sustainable development (SD) is about meeting the "needs of the present without compromising future generations' ability to meet their own needs" (Miskiewicz & Oliwa, 2021, p. 89). Finally, on the basis of the executed investigation authors of this article found out that 4 digitainability BG present on SBS are relevant for the further analyses – Banca Intesa (BI), UniCredit bank (UCB), Raiffeisen bank (RBI) and ProCredit bank (PCB).

The subject of the research is to determine the practice level of sustainability and its main determinants of major BGs performing business in the Republic of Serbia (RS). It should have in mind that local banks which are part of EU BGs' are heavily dependent (in compliance) on parent group' rules and practices (in all segments). Accordingly, the aim of the paper is to approach the habit of sustainable business between the leading European BGs (in terms of assets, according to ECB' significance criteria and list of supervised banks on 01/01/2023) in the SBS. The rising worry about climate change and its overall impact have influence on banking business model shift to holistic approach, including the plug in of sustainability and responsible aspect of banking performance. Therefore, there is the need to incorporate non-financial (NF) indicators in total business output. Climate risks are systematic risk for financial system and have impact on the banks' credit portfolio. Having in mind that SBS generates the main profit from credit activity it is obvious that more cautious risk management including E-considerations should be in place.

For easier understanding, summary of all abbreviations being used is introduced in Table 1.

Table 1: List of abbreviations

Abbreviation	Stands for	Abbreviation	Stands for
ASB	Association of Serbian Banks	NFR	Non-financial Reports
BI	Banca Intesa	NFRD	Non-financial Reporting Directive (Directive 2014/95/EU)
BG	Banking Groups	NI	Net Income
BS	Banking Sector	NII	Net Interest Income
BTAR	Banking book taxonomy alignment	NPL	Non-performing Loans
CDP	Carbon Disclosure Project	NBS	National Bank of Serbia
CEO	Chief Executive Officer	OECD	Organization for Economic Cooperation and Development
CET1ratio	Ratio of Common Equity Tier 1	PCAF	Partnership for Carbon Accounting Financials
CI	Community Investments	PCB	ProCredit Bank
CIR	Cost Income Ratio	PRI	Principles for Responsible Investments
CFO	Chief Financial Officer	PRB	Principles for Responsible Banking
CSR	Corporate Social Responsibility	ROA	Return on Assets
E	Environmental	ROE	Return on Equity
EBA	European Banking Authority	RBI	Raiffeisen Bank
ECB	European Central Bank	RI	Responsible Investments
EL	Environmental Loans	RS	Republic of Serbia
EMAS	European Union eco-management and audit scheme	RTCO2	Reduction of tCO2
ER	Environmental Risks	S	Social
ESG	Environmental Social Governance	SB	Sustainable Banking
EU	European Union	SBS	Serbian Banking Sector
EU taxonomy regulation	Regulation EU 2019/2088 on sustainability-related disclosures in the financial services sector	SD	Sustainable Development

Abbreviation	Stands for	Abbreviation	Stands for
G	Governance	SDG	Sustainable Development Goals
GAR	Green asset ratio	SRI	Social Responsible Investments
GRI standards	Global Reporting Initiative Sustainable Reporting Standards	TCFD Report	Task Force for Climate-Related Financial Disclosures Report
IFC	International Finance Corporation	UCB	UniCredit Bank
IIRC	International Integration Reporting Council	UN	United Nations
ILO	International Labor Organization	UNEP FI	United Environmental Programme Finance Initiative
ISO	International Organization for Standardization	UNGC	United Nations Global Compact
KPI	Key performance indicator	UNGPBHR	United Nations Guiding Principles on Business and Human Rights
NF	Non-financial	WEF	World Economic Forum

The article consists of 5 chapters: Introduction, Theoretical background, Methodology, Research Results and Discussion, and Conclusion.

2. Theoretical background

In 1983, the UN General Assembly called the World Commission on Environment and Development, in order to propose long-term solutions for obtaining SD, as results of increasing various E-problems accompanied with the ascent the living standards of the world's population. In 1987 it resulted in publishing the report "Our common future" which carried out the concept of SD and guidance how it could be accomplished. At the same time the report lay down the principles for the Rio de Janeiro Earth Summit held in 1992 (CFA Society United Kingdom, 2021), which in wider sense represents the root of modern RI. Thus to the Rio Declaration, all legal entities have obligation to perform sustainable business (respecting E and society needs) in accordance with the SD Agenda[1]. In accordance with it, in 1997, UN Environment Programme, Ceres and Tellus Institute established GRI as an international standards organization helping various stakeholders to take responsibility, increase transparency and communicate on common way their sustainability contributions and impacts. It helps organization on transparent way to express achieved performance in four key areas of sustainable business: economical, E, S and G (GRI, 2021).

Early stage of ESG[2] was linked to the SRI i.e., investing in firms which carried out business in align with value - investors respect ethical issues of S and E nature. Accordingly, modern SRI links ESG factors into the traditional investing framework focused only on expected profit and risk-adjusted returns. In 2004, the contemporary form of ESG investments has started, as the result of UN representatives' initiative with CEOs of principal financial institutions to take part in the joint action of UNGC (2022) and IFC to plug in ESG into capital markets. The report "Who Cares Wins" was the outcome of it (UN Department of Public Information, 2004) introducing the term "ESG" and integrated ESG factors in functioning of sustainable capital markets impacting on societies. Concurrently, the UNEP FI (2005) created Freshfileds Report, discovered that ESG issues are vital for financial valuation and markets' operations. Furthermore, both reports are backbone for introduction of the Principles for RI (PRI) at the NYSE in 2006 and the Sustainable Stock Exchange Initiative in 2007. Finally, UNEP FI installed framework covering: 1) PRI, 2) Principles for Sustainable Insurance and 3) PRB- securing that contractual banks' strategy and practice assort with the futures SDG and the Paris Climate Agreement.

[1] It was ground for foundation of UN SD Goals (SDG) in 2015.
[2] There is no universal standard for ESG issues. In general: 1) E factors relates to natural world, 2) S factors impacts the lives of humans, 3) G factors tackles issues related to countries and/or jurisdictions, as well as the interest of broader stakeholder groups (CFA Society United Kingdom, 2021).

Different standards pertained to NFR and relevant ESG practice in the banking industry is summarized in Table 2.

Table 2: Relevant ESG regulatory framework for banks

Regulation	Requirements OR Area of implementation
NFRD	Companies apply standards in order to provide comprehensive information for all stakeholders (especially investors, consumers and supervisory bodies) how they will bring better decisions having in mind overall approach in analyzing all business components impacting company's business model and whole society i.e. it should be in the function of sustainable business. In accordance with it, NFR should include: 1) a brief description of the company's business model and policies related to the following issues: E, S and human resources, human rights, fight against corruption and bribery, and diversity (different considering aspects such as, for example, age, gender or education and profession, and the goals of diversity policy, the way on which it is implemented and the results in the reporting period); the analysis being conducted; the results of these measure and the underlying risks associated with those issues related to the company's operations; NF KPI important for a particular business. 2) Information about applied methodology: national, EU (EMAS guidelines...) or international (GRI standards, OECD guidelines, UNGC, UNGPBHR, ISO 26000, ILO Tripartite Declaration, IIRC...) framework/s.
EU taxonomy	Goals are to provide investors with information on whether an economic activity is environmentally sustainable by incorporating common EU criteria. 3 objectives of taxonomy regulation are: 1) to reallocate capital flows towards sustainable investments; 2) to manage financial risks created from climate change, natural disasters, environmental degradation and social issues; 3) to promote transparency and a long-term economic outlook.
EBA	In 2022 EBA introduced technical standards on Pillar 3 disclosures of ESG risks, which should be in place around March 2023. It is vital tool for promoting market discipline in the terms of providing stakeholders with ESG related risks and sustainable finance strategy. The EBA ESG Pillar 3 package will help banks to establish an international best practice in providing mandatory and consistent fulfillment of disclosure requirements. Furthermore, the technical standards provide: 1) comparable quantitative information on: a) climate-change related transition and physical risks; including KPIs on institutions' assets financing activities that are environmentally sustainable according to the EU taxonomy (GAR and BTAR); 2) qualitative information on how institutions are embedding ESG considerations in their G, business model, strategy and risk management framework.

Sustainable banking (SB) is defined as "the delivery of wide range of invented financial products for satisfaction of customers' requirements taking care about environment and generating profit" (Yip & Bocken, 2018, p. 150). SB (Jucken, 2004; 2010) and coherent terms such as banks' CSR, ethical banks (Birindelli et al., 2015), eco-banking, and green-banks (Bahl, 2012; Bouma & Jaucken, 2017) as resolute part in fostering SD, have been anatomized comprehensively.

There is a rising significance carrying out SDG by SBS, because they are key financial mediators impacting the entire community (Alexander, 2014; Beck et al., 2010; UN, 2015; Yip & Bocken, 2018). For instance, G credit can prevent carbon intensity by pushing industrial structure upgrading, technological innovation and signal effect (Hu & Zheng, 2021; Zakic et al., 2020). Moreover, different outside agents, such as: world economic crisis in 2008 (Mattila et al., 2010; Ruiz et al., 2014), the Fourth Industrial Revolution (Schwab, 2017) and the corona virus pandemic (ASB, 2021), have had an effect on transition of the banking industry business model i.e. digitainaiblity (Lichtenthaler, 2021; Sa et al., 2021; Stefanovic et al., 2021) and improved G and risk management models and practice taking in consideration ESG risk factors in the decision making process and evaluating their influence on financial systems (Plowright et al., 2015).

Hu and Zheng, (2021) mentioned that in the various research outputs authors used instead of green credits analogue terms such as S finance, E finance, climate finance and green finance. The research of (Zhang et al., 2022) detected that rising banks' competition, shortening long-term costs, supplying online banking capabilities, and decreasing of carbon footprints are the major values of green banking development, as it supports in the accomplishment of the state's SD. Moreover, Buallay's findings (2018) showed significant positive impact of ESG on the European BS's performance. Accordingly, research findings of Batae et al.

(2021) confirmed a positive relation between emission reductions and financial performance of 39 European banks in the period 2010-2019. Furthermore, European policy makers and regulators are enriched the law-making framework in order to obtain a more sustainable economic system, where financial intermediaries are catalysts (Bruno & Lagasio, 2021). In accordance with it, Novokmet and Rogosic (2016) showed that there were still examples of sustainable reporting in the banking sector, with special focus on UCB group and its Integrated Report, which includes activities of daughter bank in the RS. Aracil et al. (2021) did an extensive survey of SB literature (applying of network analysis techniques to group topics), forming representative pattern of 676 studies (1995-2019) from WoS's SSCI database which confirmed that sustainable banking literature is built on 3 conceptual domains: Ethical Foundations, Financial products and Business-Case. The majority of researches are published in the area of Business-Case (such as indirect links between SB and KPIs, customers' satisfaction in order to survive industry transformation, stakeholder management in the function of getting proper stakeholder satisfactions' awards, risk management in the function of creating ESG values for different stakeholders, etc.). RS researches partly related to SB are: 1) digitainability of SBS using content analysis of financial and NF data of analyzed and applying Pearson's coefficient of correlation for two indicators – intangible assets (dependent indicator) and net profit (dependent indicator) on sample of 25 banks in the period of 2011-2020 (Stefanovic et al., 2021); 2) global sustainable financing practices in BS (Sredojevic & Sredojevic, 2021) and designing global sustainable financial systems (Miskiewicz & Oliwa, 2021); 3) CSR and company's performance (Mijokovic et al., 2020) and reputation (Chroneos-Krasavac et al., 2021), and importance of green financing (Stojkovic et al., 2021); 4) environmental disclosure practice in the SBS (Hanic et al., 2021; Stefanovic et al., 2021).

Having in mind foregoing findings, it can be stated that this study represents pioneered effort in respect of incorporation of ESG elements for principal BGs in SBS, with the comprehensive analysis of subject's legislative framework.

3. Methodology

The paper draws on survey of (Stefanovic et al., 2021) founded on different banks' reports and publications (financial and NF), with the challenging task due to of lack of information (especially quantitative) and non-uniform practice (confirmed in studies of Stefanovic et al., 2021; and Hanic et al., 2021/directly, for the shorter period and sample of analysis/ and Novokmet & Rogosic, 2016/indirectly, for the shorter period of analysis including one BG subject of the analysis/) in order to identify the targeted sample of local banks and indicators (sustainable and financial) for further reveal of the direct or indirect link of SB and corporate performance, as further continuity of the research in the Business-Case Domain. It had 3 step content analysis approach to: (1) identify RS banks with adequate NFR, even though with the descriptive elements – 3 fulfilled the criteria: BI (2010-2019), Erste bank (2008-2020) and "3 bank" (2020); (2) determine BG which have those reports (both quantitative and qualitative elements in the case of analysing data from local banks' websites which led authors to the group/headquarter' website and consolidated figures of all banks which perform business in Europe/) – 6 BGs implemented it: BI (2003-2021), UCB (2001-2021), RBI (2004-2021; E credit portfolio data exists from 2015), Erste (2021), NLB (2020) and PCB (2013-2021); (3) unified time series (2015-2021) and to ensure comparative data for sustainable indicators: EL, reduction of tCO2 (RTCO2) and community investments (CI) - 4 BGs were finally taken in the survey: BI, UCB, RBI and PCB.

Having in mind that SBS generates the main profit from traditional lending and the interest rate spread, the authors: 1) contemplate EL as main dependent variable, accompanied by particular financial and NF metrics as independent ones; 2) RTCO2 and CI were handed as other ESG-related metrics since standard financial metrics were comprehended in the analysis, reflecting agents for various business facets: ROE and net income /NI/ (profitability), leverage (solvency), ratios of common equity capital (CET1) and NPL (financial stability), and cost-to-income ratio /CIR/ (efficiency); 3) shifted three absolute indicators referred to ESG into logarithmic values in order to obtain normalized dataset. Source of information for: (1) traditional financial metrics are official annual reports for four BGs (on consolidated level); (2) ESG-related data (there is no homogeneous source of information; more part of integrative ESG-framework, covering different set of reports and legislations of qualitative nature /Table 3/).

Table 3: ESG framework for sampled BGs

Banking groups	ESG Framework
BI	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: 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 and; EU taxonomy regulation; EBA regulation.
UCB	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.
RBI	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; GRI standards; CDP; Regulatory disclosure; EBA regulation.
PCB	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 investigated banking groups (April, 2022)

The applied methods will include: (1) descriptive statistics for all research variables; (2) correlation and its significance between all variables; (3) regression test utilizing ANOVA, where EL and profitability variables will be tested individually as the dependant variables since other ESG and financial metrics will serve as independent ones.

4. Research Results and Discussion

BI, UCB and RBI are ranked in the top ten banks on the Serbian market, while the PCB is ranked below 10th place and isn't systematically important bank for SBS on 06/30/22 (NBS, 2022) (Table 4). Moreover, the first three banks have better: 1) execution in profitability (ROA /Return on Assets/ range 1.3%-1.9%) contrasting with the average of the SBS (ROA 1.2%); 2) earning capability than the consolidated group results (ROA range 0.2%-0.99%; ROE range 2.9%-10.6% in 2021/). Finally, PCB has positive development of business, but profitability (ROA 0.44% and ROE 3.89%) is worse in contrast with the group consolidated outcomes (ROA 0.97% and ROE 9.7% in 2021). It is significant to say that all pattern BGs have adequate ESG data on the site (Table 1) relevant for further investigation. It can be noticed, that 3 of analyzed banks (BI, UCB and PCB) have EL. Moreover, all of them have impact on society and VIRTUS award.

Table 4: Financial and non-financial overview of sampled BGs

Banks			BI	UCB	RBI	PCB	Average of SBS
Indicators	**Market share**	**Assets /ranking/**	14.8 /1/	10.7 /3/	8.5 /5/	3.1 /13/	
		New Loans	15.4	10.55	7.4	2.96	
		Deposits	16	10.7	10.2	3.1	
	ROA (%)		1.4	1.3	1.9	0.44	
	ROE (%)		9.1	7.9	14.1	3.89	1.2
	CIR (%)		60	56	53	81	8.0
	E		+	+	+/-	+	n/a
	S		+	+	+	+	
	G		+	+	+	+	
	Digitainability/ profitability		+	+	+	+	
Comment			Loans for energy efficiency; VIRTUS award;	Loans for energy efficiency; VIRTUS award;	Loans for digitalization of business and introduction of innovative products: VIRTUS award;	Loans for energy efficiency; VIRTUS award;	

Source: Authors' calculations on the basis of data on sites of the NBS and investigated banks, and Stefanovic et al. (2021)

Following findings, on aggregate level, were found: A) 1) all banks had: a) affirmative trend of business in accordance with the general global market movements; and CET1 and leverage indicators are far above the regulatory threshold. b) Good G-practice due to the disclosure data (Table 3) which is in line with Batae et al. (2021). 2) UCB had: a) the best earning capability (ROA, ROE, NI and net interest income) and NPL values; b) leading position in EL, accompanied by BI, RBI and PCB. With regard to ESG data (which can be evaluated as very good), they are part of integral reporting package: annual reports, consolidated financial reports and NFR; ESG reporting package includes ESG ratings: 1) E supply chain covers biodiversity, climate change, pollution & resources, and water security; 2) S involves labour standards, human rights & community, health & safety, and customer responsibility, and 3) G comprehends anti-corruption, corporate governance, risk management and tax transparency; It is in line with Novokmet and Rogosic (2016) that UCB is the best-in-class example of sustainable reporting European BS; B) vary in the method of informing and presenting their outcomes to stakeholders (for instance: the term of the EL product and style of showing the structure /purpose or beneficiary/, names which are used for CI: donations and investments, etc.) and the flow of strategies' acceptance and execution. It can be concluded that full implementation of EBA ESG Pillar III (2022) package set up disclosure timelines and granular templates to foster consistency, comparability and meaningfulness of these disclosures by banks.

4.1 Descriptive statistics and correlations

Results of all applied methods are done by the authors of the research. Firstly, it starts with Table 5 presenting outcomes of basic descriptive statistics: 1) all the logged data pointers have demonstrated less of variation and standard error, as opposed to outcomes for conventional financial pointers; 2) the highest standard deviation can be noticed in CIR, telling unique access of patterned banks related to efficiency and operating management; 3) the same conclusion can be brought for solvency outcomes for analysed BG; 4) variations are also high with regard to banks' profitability ratio where ROE metric ranges from 2.90% to 12.70%; contrariwise to outcomes of NI which demonstrates significantly lower standard deviation; 5) practically half of the variables are demonstrating nearly symmetrical distribution, with the skewness ranging between -0.5 and 0.5. On the other hand, NPL and Leverage outcomes are demonstrating significantly positive skewness (1.11 and 1.13; respectively); 6) kurtosis outcomes are showing flatter than normal distribution for all changeable.

Table 5: Results of descriptive statistics

Statistical measure/ Exploration changeable	*Mean*	*Standard Error*	*Median*	*Standard Deviation*	*Sample Variance*	*Kurtosis*	*Skewness*	*Range*	*Minimum*	*Maximum*	*Count*
ln_NI	2.96	0.15	3.16	0.77	0.60	-0.88	-0.73	2.45	1.62	4.07	28
ROE	7.81	0.49	7.60	2.59	6.71	-0.62	0.19	9.80	2.90	12.70	28
CIR	59.91	1.36	56.45	7.22	52.09	-0.85	0.74	22.90	50.80	73.70	28
NPL	2.93	0.39	2.48	2.08	4.33	1.05	1.11	8.30	0.30	8.60	28
Leverage	12.48	0.49	12.70	2.61	6.82	2.46	1.13	12.25	8.60	20.85	28
CET 1	13.38	0.25	13.60	1.35	1.81	0.49	-0.79	5.40	10.00	15.40	28
ln_CI	0.82	0.20	1.10	1.06	1.12	-1.30	-0.48	3.17	-0.90	2.27	28
ln_RTCO2	4.47	0.12	4.42	0.65	0.42	-1.31	0.41	1.80	3.74	5.54	28
ln_EL	3.33	0.09	3.26	0.47	0.22	-0.49	0.11	1.89	2.42	4.31	28

It is important to mention particular conclusions linked to correlation analysis: 1) examination the ESG practice - the correlation is strong and positive in all pairs, circulating around value of 0.70 (Table 6). That might indicate holistic access to ESG business practice where S element (CI) demonstrates almost perfect positive correlation with the NI, indicating significant connection between banking sectors' profitability and CSR; consisting with findings of Taliento et al. (2019), Buallay (2018) and Weber (2017). Opposite to that, there is a strong negative connection between CI and CIR, indicating significant cost-management and efficiency access. 2) ROE demonstrates no significant correlation with the ESG pointers since NI has opposite outcomes, consisting with findings of (Hanic et al., 2021). 3) There is a negative relationship between size of the EL and NPL, verifying good risk management practice; in order to stimulate further growth of EL there is necessity for different external financial stimulus (Jin et al., 2022; Mazzucato & Semieniuk, 2018; Polzin et al., 2015).

Table 6: Correlation matrix – pairwise

Indicator	*ROE*	*Ln_NI*	*CIR*	*NPL*	*Leverage*	*CET 1*	*Ln_CI*	*Ln_RTCO2*	*Ln_EL*
ROE	**1**	0.066	-0.034	0.098	-0.270	0.003	-0.158	-0.269	-0.179
Ln_NI	0.066	**1**	**-0.821**	**-0.453**	**0.745**	0.024	**0.935**	**0.611**	**0.717**
CIR	-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	0.003	0.024	-0.257	**-0.516**	-0.166	**1**	0.068	-0.180	0.153
Ln_CI	-0.158	**0.935**	**-0.825**	**-0.462**	**0.764**	0.068	**1**	**0.687**	**0.699**
Ln_RTCO2	-0.269	**0.611**	-0.281	**-0.399**	**0.763**	-0.180	**0.687**	**1**	**0.694**
Ln_EL	-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;

4.2 Regression results

The importance of NPL, as a credit risk metric, is validated through regression results too, where EL pointer was taken as dependent variable (Table 7, second column). NPL has strong significant negative relationship with EL, aligned with findings of Cui et al. (2018), Zhou et al. (2020), and Al-Qudah et al. (2023), demonstrating importance of green lending with respect to credit risk performance.

Moreover, other two ESG pointers are also demonstrating statistical significance (Table 8), with the p-values less than 0.05, and all over the model suitable for the data with the high F-value and high coefficient of determination. It goes in line that European BGs are respecting standards of Basel III and preparing for implementation of EBA ESG Pillar 3. Other financial metrics are not displaying any statistical significance.

Table 7: The model summary and ANOVA results for EL, NI and ROE as dependent variables, respectively

Indicator/ Statistical measure	**EI Values**				**NI Values**				**ROE Values**			
Multiple r	0.93124809				0.98182182				0.76065803			
R square	0.86722301				0.96397409				0.57860063			
Adjusted R square	0.81131691				0.94880528				0.40116932			
Standard error	0.20420385				0.17510273				2.00462618			
Observations	28											
ANOVA	***SS***	***MS***	***F***	***Significance F***	***SS***	***MS***	***F***	***Significance F***	***SS***	***MS***	***F***	***Significance F***
Regression (*df*: 8)	5.1747	0.646	15.5121	8.0129E-07	15.5879	1.9484	63.5497	4.419E-12	104.8347	13.1043	3.26098	0.016
Residual (*df*: 19)	0.7922	0.041 6			0.58255835	0.03066097			76.3519966	4.01852		
Total (*df:* 27)	5.9670				16.1705				181.1867			

Table 8: Coefficients for EL as dependent variable

Statistical measure/ Indicator	***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_NI	0.0109	0.2660	0.0408	0.9679	-0.5459	0.5676
CIR	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	-0.0068	0.0404	-0.1679	0.8684	-0.0913	0.0777
Ln_CI	0.4154	0.1907	2.1788	0.0421*	0.0163	0.8144
Ln_RTCO2	-0.8259	0.1743	-4.7381	0.0001*	-1.1907	-0.4611

**95% confidence interval;*

Further, third and fourth column of the applied model comprehend profitability metrics - NI and ROE, respectively, as dependent variables (Table 7). Despite being very powerful and fitting (with the adjusted R square value of almost 95%), regression with NI as dependent variable doesn't obtain any statistical significance of neither of three ESG-related indicators (Table 9), with their p-values being much higher than 0.05 consistent with findings in Batae et al. (2021); Esteban-Sanchez et al. (2017); and Jacobs et al. (2010).

Table 9: Coefficients for NI as dependent variable

Statistical measure/ Indicator	***Coefficients***	***Standard Error***	***t Stat***	***P-value***	***Lower 95%***	***Upper 95%***
Intercept	3.33247932	0.99805026	3.3389894	0.0034484	1.24353611	5.4214225
ROE	0.06301683	0.01387687	4.5411411	0.0002233*	0.0339722	0.0920614
CIR	-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	-0.010652	0.03711722	-0.2869827	0.77723184	-0.0883392	0.06703523
Ln_CI	0.08362766	0.19498499	0.42889279	0.67282475	-0.3244806	0.49173592
Ln_RTCO2	0.0625777	0.13180929	0.47475937	0.64036987	-0.2133023	0.33845772
Ln_EL	0.17882884	0.13799026	1.29595265	0.21051431	-0.1099881	0.46764577

**95% confidence interval;*

The model is even less suitable when it comes to setting ROE as dependent variable, with adjusted R^2 being only 0.40 and with the F-statistics of 3.26. Like previous findings, none of the ESG indicators is demonstrating statistical significance with the ROE, with the p-values much higher than threshold; aligned with finding in Batae et al. (2021) and Jacobs et al. (2010).

Table 10: Coefficients for ROE as dependent variable

Statistical measure/ Exploration 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_NI	8.25919066	1.81874783	4.54114117	0.00022334*	4.4525077	12.0658736
CIR	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	0.00112267	0.42584844	0.00263631	0.99792401	-0.8901884	0.8924337
Ln_CI	-1.3068011	2.22289785	-0.5878818	0.56353446	-5.9593798	3.34577756
Ln_RTCO2	-0.5846779	1.51197651	-0.3866978	0.70327678	-3.7492811	2.57992528
Ln_EL	-1.5875649	1.60734693	-0.9876928	0.33571515	-4.9517807	1.77665084

Conclusion

Having in mind contemporary trends in global markets, including appearances of new financial institutions and instruments, there is an urge for financial intermediaries to adapt themselves, for the benefit of all stakeholders in the financial system. Accordingly, international BGs and investment industry, should be the proactive participants in changes of business models, by incorporating adequate ESG practices and pointers, as holistic approach to sustainable business on individual and global level. Thus, policy makers and regulators should enrich the law-making framework in order obtain a more sustainable economic system. Although banking industry is far from being a major polluter, it should use its intermediating role to impact corporate stakeholders and wider community, in order to improve sustainable business practice.

The theme of the paper is vital due to the fact that Serbian financial market is bank-centring. The key banking players (on group level: BI, UCB, RBI and PCB) are dedicated to the digitainaiblity and profitability. Simultaneously, they lead profitable business with the holistic impact on ESG-related issues. Furthermore, all BG on transparent way disclose their annual reports, consolidated financial reports and NFR which are part of integral reporting package.

The survey aim was to analyse various ESG-related practices within the leading international BGs present on SBS, including their high-level financial performance. Relevant research results are: 1) sustainability in their businesses have significant inter-connectedness among ESG constituents, as well as with some of the financial metrics; 2) statistical significance of ESG metrics for EL; however similar findings are missing when it comes to association between financial performance (in terms of profitability) and ESG practice. When it comes to qualitative aspects of sustainable reporting practice and regulatory framework, among 4 banks from data sample, UniCredit bank has shown the most holistic approach, with the accompanied results. Main limitation of the research was small sample due to heterogeneous law-making framework, deficiency of adequate data and reports for bank entities performing solely in the Serbian banking sector (the reason to use group/consolidated) and incapability to uniform the ESG metrics for quantitative analysis. Nevertheless, it represents the first survey of its type in Serbian financial industry. It is expected to be more broad and detailed, with more relevant data, as result of the improved ESG-related legislative framework and its implementation across the industry.

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