

Tracking of Planetary and Social Boundaries in Banking: A Content Analysis of Sustainability Reports in Central-Eastern Europe

Răzvan-Octavian GIURCĂ*

Bucharest University of Economic Studies, Bucharest, Romania

*Corresponding author, giurcarazvan23@stud.ase.ro

Abstract. *Human economic activities have caused major damage to Earth's ecosystems during recent times. This have led businesses to adopt sustainability practices throughout their operations and reporting systems. This research investigates the degree to which major banks in Central-Eastern Europe (CEE) include planetary and social boundaries within their sustainability reports. The research examines 59 official sustainability and non-financial reports from major banks in Austria, Poland, Hungary, Romania and the Czech Republic through a longitudinal content analysis from 2017 to 2023. The research shows that sustainability reporting in CEE banks is inconsistent because they focus strongly on climate change but show weak engagement with biodiversity loss and freshwater consumption and land-system change. The corporate disclosures focused more on social boundaries which included education, jobs, income, gender equality and healthcare. The study shows that climate change mentions increased after 2019 when the European Union launched its Green Deal and social indicators reached their peak during the COVID-19 pandemic. The study shows that corporate sustainability reporting has become more compliance-based instead of transformational, despite rising regulatory and stakeholder expectations. The research adds to sustainability discourse by revealing reporting practice deficiencies and providing guidance for improvement. The research demonstrates that financial institutions operating in Central-Eastern European economies need to develop a more complete sustainability framework. The research findings demonstrate the need for stronger regulatory frameworks and corporate sustainability dedication to establish a resilient equitable global economy.*

Keywords: Sustainability reporting, planetary boundaries, social boundaries, corporate social responsibility (CSR), longitudinal content analysis, Central-Eastern Europe (CEE), banking sector.

Introduction

Human economic activities have exceeded Earth's stable ecosystem limits throughout recent history since the beginning of the Anthropocene era. The Holocene period which lasted about 10,000 years brought stability to Earth until industrial growth and fossil fuel dependence and destructive farming methods disrupted this equilibrium. The research by Rockström et al. (2009, p.2) shows that human activities have exceeded multiple planetary boundaries which threatens the ecological systems needed for future generations. Businesses as leading economic entities now need to implement sustainability practices in their operations while maintaining open disclosure of their sustainability progress.

Corporate Social Responsibility (CSR) functions as a vital element of corporate sustainability initiatives which has existed since the past decades.

The concept of Corporate Social Responsibility emerged in the early twentieth century according to Dolan and Zalles (2022) before scholars Bowen (1953) and Carroll (1979, pp. 497-505) expanded its definition to include economic and legal ethical and discretionary responsibilities in the mid-twentieth century (Witkowska, 2016, p.2). CSR evolved into an essential business

strategy which now combines environmental elements with social aspects and governance practices. The traditional internal corporate focus of CSR has shifted to ESG reporting which now examines external sustainability impacts while meeting investor requirements and regulatory standards (Kassier, 2024, p.9).

The environmental crises of the 1980s prompted the development of sustainability reporting as corporations became more accountable. The 1990s witnessed an increase in social reporting which became more prevalent (Landrum & Ohsowski, 2018, p.3). The progress in reporting standards resulted in the establishment of the Global Reporting Initiative (GRI) during the late 1990s which provided standardized disclosure guidelines for sustainability reports. The reporting frameworks have advanced through time by adding ESG metrics while complying with worldwide initiatives such as the UN Sustainable Development Goals (SDGs). The worldwide increase of sustainability reports from companies and national government policies supporting this trend is documented by dos Santos et al. (2020, p.100). Sustainability reporting has traditionally been optional but the practice is becoming more widely enforced as a requirement.

Financial institutions like banks maintain a powerful dedication to corporate social responsibility (CSR) through their operational framework alignment with stakeholder sustainability expectations (Sebastião et al., 2024, p.4). According to Baldissera (2023, p.7) institutions with bigger financial performance and stronger assets tend to publish more detailed sustainability data. The quality of sustainability reporting has increased through banks that publish more detailed information across various themes.

Sustainability Reporting topics shifted but Rockström et al. (2009, p.6) established nine planetary boundaries that sustain Earth's stability, including climate change and biodiversity loss. Six out of nine planetary boundaries have been crossed according to Richardson et al. (2023, p.4) which threatens the sustainability work of corporations. Raworth (2012, p.10) established 11 social boundaries which connect environmental sustainability to social equity in the original framework. The "doughnut economics" model by Raworth (2012, p.10) recommends businesses to merge environmental sustainability with human well-being during strategic planning. Sustainability frameworks have progressed theoretically but corporate reporting continues to fail in addressing fundamental environmental and social problems. Studies demonstrate that companies tend to emphasize climate change initiatives yet they fail to address essential planetary boundaries including biodiversity loss and water consumption and land degradation (Kassier, 2024, p.21). The existing reporting gap demonstrates the need for advanced sustainability reporting practices that surpass basic compliance disclosures to deliver meaningful transformative changes.

This research investigates how leading banking institutions in Central-Eastern Europe (CEE) implement planetary and social boundaries through their sustainability reporting. The research evaluates financial sector sustainability principle integration by analyzing official sustainability and non-financial reports from major banks operating in Austria, Poland, Hungary, Romania and Czech Republic. This study employs a longitudinal content analysis to monitor how selected banks in the region incorporate sustainability discourse from 2017 through 2023. The research methodology uses ATLAS.ti qualitative data analysis software to analyze corporate reports for sustainability-related term frequencies.

The study investigates sustainability reporting patterns to determine if CEE businesses modified their approaches because of planetary and social boundaries. The research findings will enhance corporate sustainability discussions through the identification of successful practices and reporting deficiencies and recommendations for better sustainability communication methods. This

research aims to deliver important findings about sustainability reporting development that promotes corporate accountability while building a stronger global economy based on equity.

Literature review

The Earth experienced various environmental transformations since its beginning, being unstable on the long-term. The period from 10,000 years ago until the Industrial Revolution brought stability which enabled human civilization to grow and develop substantially during the Holocene era. Then, after the Holocene era, another period arises - the Anthropocene, in which humankind became powerful enough to produce environmental changes by its actions. The results of these intense human activities with heavy reliance on fossil fuels or industrialized forms of agricultures could be irreversible damaging to the stable state of the Earth, a state which could have continued for over 1.000 years without the human intervention (Rockström et al., 2009, p.2).

Firms face increasing pressure to implement sustainable practices as part of CSR while disclosing their environmental impact (Kassier, 2024, p.1).

The concept of Corporate Social Responsibility (CSR) emerged in the early 1900s during the time of corporate paternalism which defined the first phases of welfare capitalism (Dolan & Zalles, 2022). The contemporary definition of CSR comes from H.R. Bowen who introduced the idea in 1953 through his foundational piece titled "Social Responsibility of the Businessman". According to Bowen business leaders should establish policies and make decisions which support both societal values and overall societal goals while understanding the central role of social responsibility in corporate operations (Witkowska, 2016, p.2).

Multiple attempts to define Corporate Social Responsibility have been made since then to combine more dimensions into the concept's core essence. Carroll (1979, 497-505) developed the CSR framework by combining legal duties with economic obligations and ethical requirements and discretionary philanthropic responsibilities within his three-dimensional model that functions as a fundamental reference in CSR research (Kassier, 2024, p.6). According to widely accepted definitions businesses must fulfill four types of responsibilities which encompass their economic and legal and ethical and discretionary (also known as philanthropic) obligations to society at any given time (Carroll & Shabana, 2010, pp. 85-89).

Sustainability Reporting emerged in the 1980s through Environmental Reports which addressed environmental disasters before social reports became available due to ethical issues in the 1990s (Landrum & Ohsowski, 2018, p.3). Businesses recognized that their environmental and social initiatives' promotion would boost both reputation and financial gains. The 2000s marked a turning point for CSR because organizations began treating it as a strategic imperative which embeds universal values into their operational framework and decision-making processes (Werther & Chandler, 2006). ESG (Environmental, Social and Governance) criteria now dominate reporting while CSR focuses on internal objectives despite their shared growth in prominence (Kassier, 2024, p.9).

Sustainability Reporting demonstrates how businesses dedicate themselves to sustainable practices and its adoption continues to increase. Sustainability reporting is becoming more widespread worldwide as more companies release such reports and governments across nations establish policies to support this development (dos Santos et al., 2020, p.100).

In 2016 GRI introduced the GRI Standards as the first set of global sustainability reporting standards which shifted from providing voluntary guidelines (GRI, 2025).

Sustainability reporting remains voluntary by tradition yet dos Santos et al. (2020, p.100) note that the practice has started to become mandatory for many organizations. The European Union's Directive 2014/95/EU established mandatory disclosure requirements for large companies to reveal

both non-financial data and diversity information thus showing a shift toward required sustainability reporting. Current market trends demonstrate that sustainability reporting needs to merge with traditional financial reporting to deliver a complete understanding of business operations and policies. Integrated sustainability reports have become increasingly popular among industries and stakeholders because they show that substantial funding is necessary to transform businesses sustainably and make these transformations appealing (dos Santos et al., 2020, p.100-101).

Financial sector banks have shown intense dedication to corporate social responsibility (CSR) by ensuring their operational methods match the sustainability standards of their stakeholders. Research by Sebastião et al. (2024, p.4) reveals reputational factors serve as a primary reason banks reveal sustainability data according to Hoepner et al. (2023) as well as Nosratabadi et al. (2020). Sebastião et al. (2024, p.4) build upon Nosratabadi et al. (2020) to reinforce that financial institutions should continue their work. Many businesses now treat their sustainable development investments as strategic opportunities to gain competitive advantages.

Banks serve as essential promoters of sustainable economic development by investing financial resources into ESG criteria-backed initiatives according to Sebastião et al. (2024, p.5) and J. Chen et al. (2022). The authors highlight how ESG integration affects financial systems mostly in emerging markets since banking institutions remain the main funding channel for organizational and individual needs.

According to the study Sebastião et al. (2024, p.16) banks face mounting pressure to develop formal sustainability strategies because it helps them address disclosure challenges. Some organizations implement sustainability reporting frameworks voluntarily yet others do so because of regulatory requirements which they demonstrate through public commitments to their stakeholders.

The research of Benvenuto et al. (2023) shows that banks across the world are shifting their operations to match sustainability targets at local, national and international scales as mentioned in Sebastião et al. (2024, p.16). The research by Baldissera (2023, p.7) identifies organizational characteristics such as size, age, financial performance, and corporate structure as key determinants of sustainability reporting practices in banking. The European banking sector demonstrates German banks use disclosure to prove their legitimacy while addressing social obligations according to Menassa and Brodhäcker (2017). Baldissera (2023, p.7) shows that bigger financial institutions with better performance outcomes tend to reveal extensive sustainability data. Sustainability reporting has undergone qualitative development because banks now report more diverse themes alongside increased disclosure amounts.

Rockström et al (2009, p.6) developed a system of nine planetary boundaries that define the safe limits for maintaining the current planetary state. These boundaries define operational limits for human activities based on the Earth's biological systems along with their processes which include climate change, biodiversity loss, disruptions of nitrogen and phosphorus cycles, stratospheric ozone depletion, ocean acidification, global freshwater consumption, land-use changes, chemical pollution (novel entities) and atmospheric aerosol accumulation. The innovative framework included quantified boundary limits to preserve Earth's Holocene-like state. According to O'Neill et al. (2018, p.1) four out of seven planetary boundaries had exceeded their limits by 2015. The number of surpassed planetary boundaries grew to six out of nine according to Richardson et al. (2023, p.4) in 2023.

The 11 social boundaries Raworth (2012, p.10) added to the planetary limits defined by Rockström et al. (2009, p.6) served as an enhancement to their framework. The framework developed from discussions that took place at the UN Conference on Sustainable Development

(Rio+20) in June 2012 and the High-Level Summit on the Millennium Development Goals in 2013. The main objective of these events focused on uniting efforts between poverty reduction goals and environmental protection targets (Raworth, 2012, p.4). Raworth (2012, p.4) presents the following illustration (Fig. 1) which shows the 11 social boundaries derived from Rio+20 government priorities together with the 9 planetary environmental boundaries identified by Rockström et al (2009).

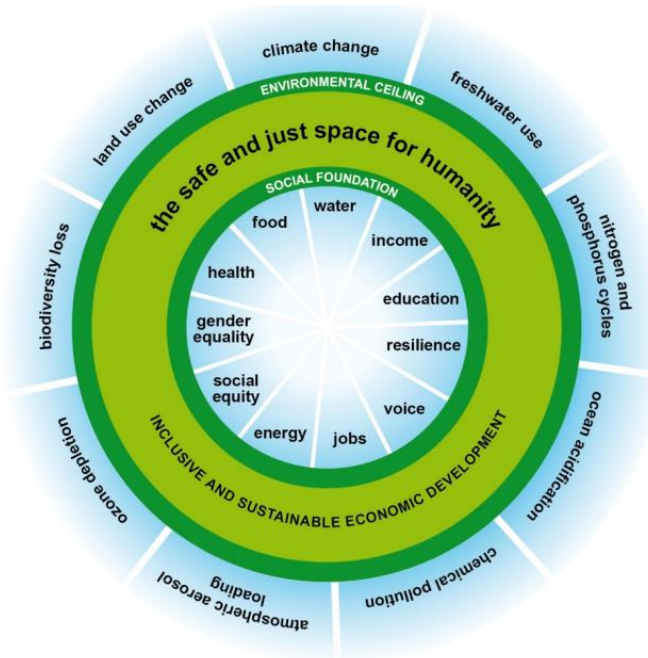


Figure 1. “A safe and just space for humanity to thrive in”

Source: Oxfam: “A safe and just space for humanity CAN WE LIVE WITHIN THE DOUGHNUT?”
(Raworth, 2012, p.4).

The measurement of social and planetary boundaries shows that humanity remains outside the "doughnut" framework. Raworth (2012, p.5) points out that severe inequalities continue to exist as 900 million people suffer from hunger and 1.4 billion live on less than \$1.25 per day and 2.7 billion lack access to clean cooking facilities. Environmental stress intensifies poverty while poverty makes environmental degradation worse. The design of policies determines whether these crises will worsen or improve but proper strategies can unite poverty reduction with sustainability to move humanity toward “the doughnut”. The current data indicates that reaching the social foundation for all existing people requires only a minimal increase in resources. The elimination of hunger needs only 1% of global food resources and electricity provision generates less than 1% of CO₂ emissions and poverty elimination requires 0.2% of worldwide income (Raworth, 2012, p.5).

Kassier (2024, p.3) analyzed top companies from the South African JSE/FTSE top 40 index through longitudinal content analysis and found that corporate social reporting fails to address essential planetary boundaries including the biosphere, freshwater consumption and land system change which are essential for sustaining life. The increasing use of climate-related terms such as CO₂ and biodiversity in reports is limited to compliance and business-focused approaches. The discussion about employment focuses primarily on costs and risks instead of its role in promoting social welfare. According to him this weak sustainability perspective does not solve the

fundamental changes needed to establish protected life spaces for human beings. The economy needs fundamental changes together with innovative approaches to establish sustainable social and ecological boundaries.

The highlighted boundaries represent a valuable starting point for further research in the Sustainability Reporting field on various business categories or geographical regions. In the next sections, the present research aims to find out to what extent leading businesses in Central-Eastern Europe incorporated the mentioned planetary and social boundaries in their Sustainability Reports, Non-Financial or Annual Reports published over time.

Methodology

The research method of content analysis serves multiple fields including sociology, communications and political science studies in order to analyze textual and visual data through both quantitative and qualitative approaches (Ignatow & Mihalcea, 2016).

The research method of content analysis requires objective coding to discover patterns and themes (Guthrie & Abeysekera, 2006). The process requires coding every paper that remains in the study through multiple established criteria. The examination process focuses on two types of data: specific terms like word occurrences and conceptual phrases that indicate particular perspectives. Content analysis becomes possible for broader time periods when data allows it. The research methods fall under longitudinal studies which Piquero & Carmichael (2005, pp. 97-101) describe as observational methods that track specific phenomena across extended periods. The research design of cross-sectional studies provides only a single momentary view of phenomena at a specific time point. Through the analysis, the research aims to answer the following two main research questions:

1. To what extent is planetary and social boundaries framework applied in the sustainability publications of the banking companies from CEE, from 2017 to 2023?
2. Was there a shift in usage, in the analysed period, in regards of planetary and social boundaries from the companies in CEE region? What was the evolution in their documents over time?

Similarly to Kassier (2024, p.7), our analysis starts from defining specific keywords for each of the planetary and social boundaries established by Rockström et al (2009) and Raworth (2012). The keywords defined are mentioned in Table 1 below. To ensure accuracy, we chose to define three keywords for each boundary. The criteria for keywords definition were the explanations given by Raworth (2012, p.10) for each category. Those keywords will be analysed using ATLAS.ti, which is a convenient qualitative data analysis software (Paulus et al, 2015, p.6). The use of ATLAS.ti enables a faster and robust analysis and facilitates more coherent results (Adelowotan, 2021, p.201).

Table 1: Keywords defined for Planetary and Social boundaries

Type	Category	Keyword 1	Keyword 2	Keyword 3
Planetary boundaries	Climate change	Climate change	Climate mitigation	Carbon footprint
	Rate of biodiversity loss (terrestrial and marine)	Biodiversity loss	Species extinction	Ecosystem degradation
	Stratospheric ozone depletion	Ozone	CFC emissions	UV
	Ocean acidification	Ocean acidification	Coral reef decline	Marine ecosystem danger
	Global freshwater use	Water stewardship	Sustainable water management	Water scarcity
	Change in land use	Urban sprawl	Deforestation	Land conservation
	Chemical pollution	Chemical pollution	Toxic chemicals	Plastic waste
	Atmospheric aerosol loading	Air pollution	Air quality	Particulate matter
	Interference with the nitrogen and phosphorus cycles	Nitrogen	Phosphorus	Nutrient pollution
Social Boundaries	Food security	Food security	Food access	Malnutrition
	Income	Wealth	Income inequality	Poverty
	Water and sanitation	Water and sanitation	Clean water access	Hygiene
	Health care	Health care	Healthcare access	Public health
	Education	Education	Education access	School
	Energy	Clean energy	Energy access	Energy poverty
	Gender equality	Gender equality	Gender pay gap	Gender inclusion
	Social equity	Social equity	Wealth distribution	Economic disparity
	Voice	Democratic Quality	Freedom of speech	Democratic rights
	Jobs	Jobs	Employment	Work conditions
	Resilience	Social safety	Social resilience	Social Support

Source: Author's work based on the planetary and social boundaries framework detailed by Raworth (2012).

The biggest banks by assets under management from Austria, Poland, Hungary, Romania and Czech Republic were chosen, as follows: Erste Group Bank AG from Austria, OTP Bank from Hungary, PKO BP from Poland, Banca Transilvania from Romania and CSOB from Czech Republic. 4 out of the 5 companies are listed under CECE BNK EUR index from Vienna Stock Exchange, which is a representative Stock Exchange from this side of Europe. The only company which is not part of the CECE BNK EUR is CSOB from Czech Republic. The decision to pick CSOB instead of Komerční Banka, which is the 3rd biggest bank in Czech Republic and is present in CECE BNK EUR index was made on the criteria of keeping the largest banks by assets under management from each country.

The study focuses on Central-Eastern Europe (CEE) because of its distinctive socio-economic and regulatory frameworks. The field of sustainability research currently lacks studies about this region compared to Western economies despite its special economic and regulatory

environment. The scope includes countries and banks that share similar characteristics thus creating a distinctive research environment. Erste Group (Austria) together with OTP Bank (Hungary), PKO BP (Poland), Banca Transilvania (Romania) and ČSOB (Czech Republic) function as the largest banking institutions within their respective territories and show regional market trends alongside sustainability standards compliance. This selection enabled the study of EU-aligned sustainability practices across multiple countries through their shared regulations and unique national priorities. The research area lacks any existing studies that evaluate planetary and social boundaries. The research spans from 2017 through 2023 to analyze important moments such as the EU Green Deal initiation in 2019 and the COVID-19 pandemic. The banking sector demonstrates high corporate social responsibility (CSR) commitment through stakeholder-driven operational practice alignment which makes them suitable subjects for the current investigation, as Sebastião et al. (2024, p.4) mentioned.

The research moved to the next phase of analysis by retrieving official documents from each company through their official website after defining the sample. The author selected Non-Financial Reports for examination yet they also analyzed direct non-financial activity disclosures found under Consolidated Annual Reports of the sample companies. The research gathered 59 documents through the following distribution: 15 documents from Erste Group Bank AG in Austria alongside 13 documents from OTP Bank in Hungary, 13 documents from CSOB in Czech Republic, 11 documents from Banca Transilvania in Romania and 7 documents from PKO BP Bank in Poland. The data collection spanned from 2017 to 2023 because it represented the earliest year with complete information for all firms. The analysis did not differentiate between Annual Reports and Non-Financial Reports since each company had an uneven number of these reports.

In the third step of the analysis, the gathered documents were ordered and uploaded to ATLAS.ti software where they were again grouped based on the company they belong to. At the same time, the documents were grouped based on the year of issuance of each material. Similarly, each planetary and social boundaries from Table 1 were added as Codes in the same Project in ATLAS.ti and those codes were grouped based on the Planetary or Social boundaries.

To find out the frequency of the keywords in our sample, a Text Search function analysis was conducted in a fourth analysis step, searching all 59 documents for the defined keywords in Table 1. For each keyword, Exact Match criteria was selected. In the fourth step, all the paragraphs where our defined keywords were found were then marked with their respective codes. Those finding were used as a baseline for the Code-Document Analysis conducted in the fifth step. Using the year of publication, the code-document analysis also allowed a longitudinal retroactive view of the keywords used in the documents from 2017 to 2023.

Results and discussions

The applied methodology described in the Research Methodology chapter allowed multiple sets of results.

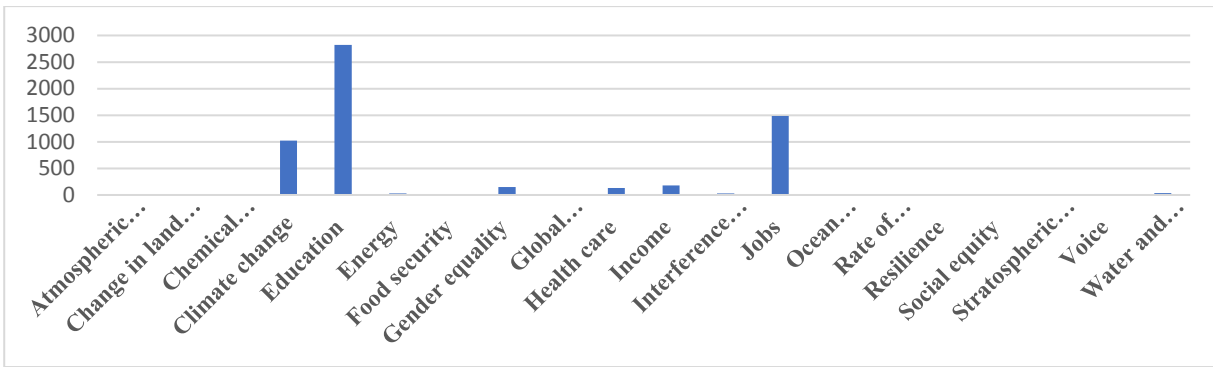


Figure 2. Frequency of codes used in the documents

Source: Author's own work based on the codes analysed in ATLAS.ti software.

From a general point of view across all documents, Education topped the charts (2824 mentions), followed by Jobs (1487), Climate Change (1024), Income (179), Gender equality (149) and Health care (130). The other codes registered less than 50 mentions each, as presented in the Figure 2 above.

Further, analysing the usage of codes (keywords) in relation with the yearly evolution between 2017 and 2023, we could observe that Climate Change was the category with the highest increase of mentions. The trajectory can be observed in Figure 3. The increase was in line with the other categories between 2017 and 2018, but from 2019 onwards, it witnessed an exponential growth of mentions that continued until 2023. One possible explanation of the increase of climate change mentions could be that the most ambitious sustainability act of the European Union was launched during that year – the Green Deal. It consisted of a package of policy initiatives from various fields: climate, environment, energy, transport, industry, agriculture and sustainable finance (European Commission, 2024). The climate change category is the only one from the nine planetary boundaries which benefited from this increase. The other ones had a low and constant count of mentions throughout the analysed period.

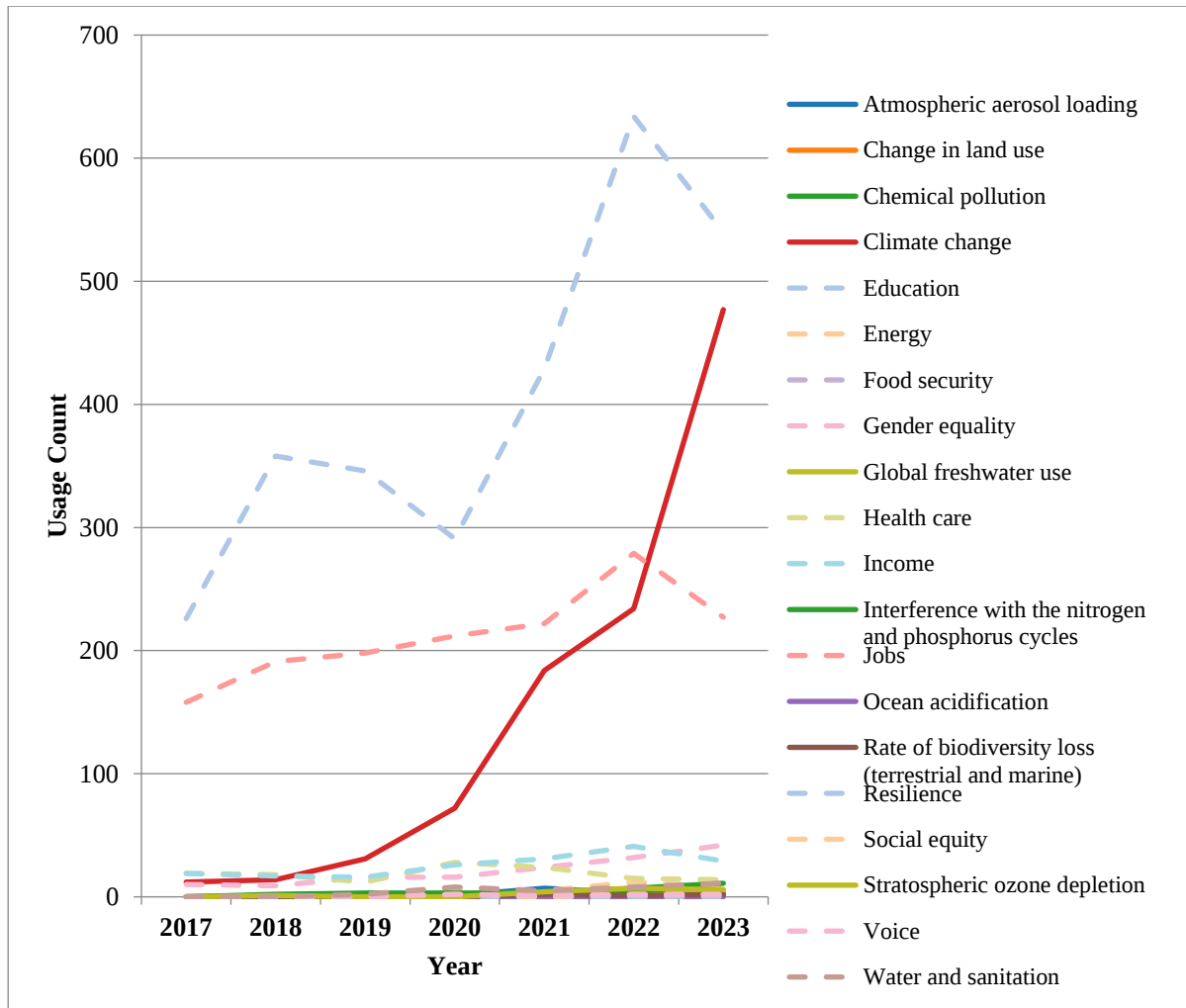


Figure 3. Usage of analysed codes (keywords) in the selected documents between 2017-2023

Source: Author's own work based on the codes analysed in ATLAS.ti software.

At the same time, the social boundaries defined by Raworth (2012), and coded in our analysis using the mentioned keywords in Table 1, had a more prominent presence in the results. For Education and Jobs, we could determine important increases over the chosen timeframe but also the most mentions across all categories searched (both for planetary and social). For these the peak was registered in 2022. For Education there was one drop followed by a re-acceleration in 2020, while for Jobs category the increase of mentions was constantly on an upward trajectory until 2022. From 2022 to 2023, both categories registered a slight decrease. Next to those two social boundary categories, we could see Income, Gender Equality and Health Care with a similar positive trend. For Income, Health Care and Gender Equality there was a slight positive detachment from the other categories. For Health Care particularly, the increase can be seen during the COVID 19 pandemic and immediately after (2020-2022), then dropping in line with the other searched categories until present.

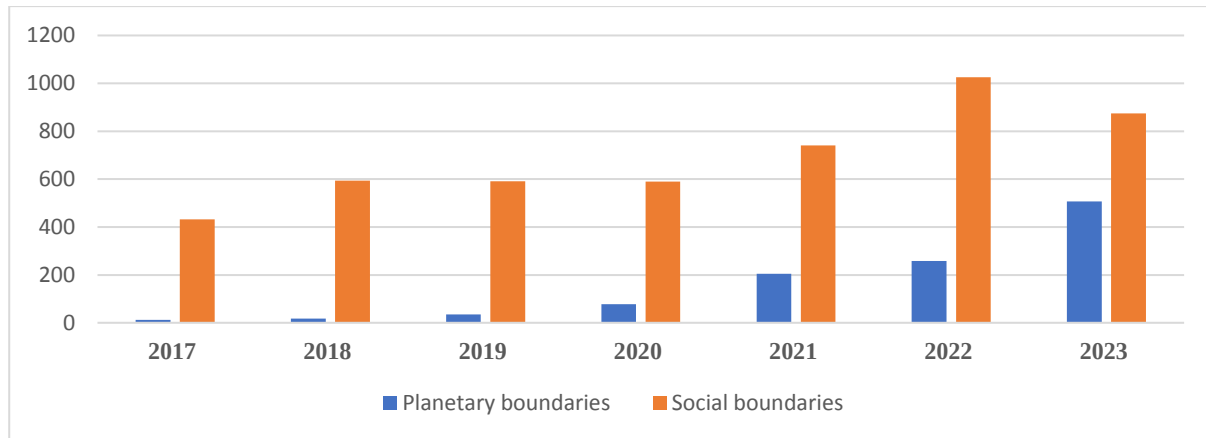


Figure 4. Planetary vs Social boundaries mentions between 2017-2023

Source: Author's own work based on the codes analysed in ATLAS.ti software.

Most of the planetary and social boundaries were not extensively mentioned in the official publications of the selected companies. Our results are lined with the ones of Kassier (2024) who concluded that corporate social reporting often neglects crucial planetary boundaries. As mentioned, the social boundaries were present to a larger extent in our analysed documents, as shown in the Figure 4. Although in the similar chart we could notice that planetary boundaries had a continuous growth trajectory, that was mainly generated by one category - Climate Change.

Further in our research we could analyse the quantity of each of the codes used by each of the companies in the sample, as shown in the Figure 5 below. We could see that Education and Jobs were the top codes used overall. On an individual level, we could see that CSOB headquartered in Czech Republic, followed by Erste AG from Austria and OTP Bank from Hungary used the Education code the most in their publications. Even though high count of mentions of the Education code were present in BT documents from Romania and PKO BP from Poland, the quantity was lower than for the rest of the companies. As for Jobs code count, Erste AG, OTP Bank and PKO BP were the ones with the most mentions, with PKO BP being the leader. High count was registered also by CSOB and BT.

The Climate Change code received the highest number of recordings among the planetary boundaries framework codes. The companies that used it the most was Erste AG, followed by OTP Bank. The companies listed in the CECE BNK EUR index from Vienna Stock Exchange used Climate Change codes extensively while CSOB from Czech Republic recorded fewer instances. For the first time, in Figure 5 we can clearly see a second planetary boundary code - Interference with the nitrogen and phosphorus cycles, with mentions registered in the Erste AG analysed documents. As for the other codes linked to social boundaries that had higher count in the previous figures, namely Income, Health care and Gender Equality, the current analysis from Figure 5 shows that those come from Erste AG (Austria), followed by OTP Bank (Hungary) and PKO BP (Poland).

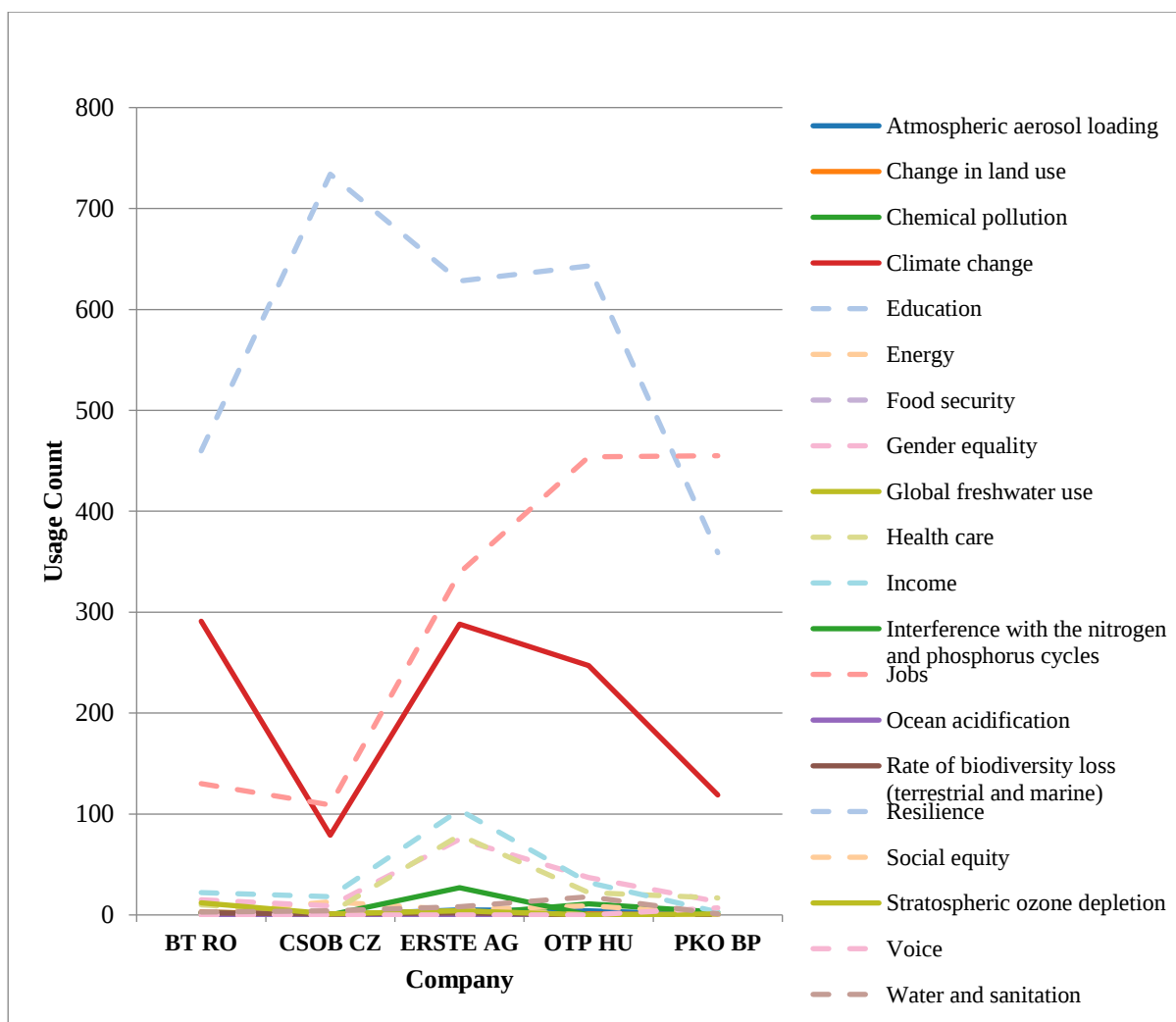


Figure 5. Usage of analysed codes (keywords) by each company between 2017-2023

Source: Author's own work based on the codes analysed in ATLAS.ti software.

Conclusion

This article looked to find to what extent leading businesses in Central-Eastern Europe incorporated the planetary and social boundaries in their Sustainability, Non-financial and Annual reports published over time. For this, the biggest banks by assets under management (Erste Group Bank AG from Austria, OTP Bank from Hungary, PKO BP from Poland, Banca Transilvania from Romania and CSOB from Czech Republic) were introduced in the research. Based on the 59 documents analysed, we were able to answer the two research questions.

The first research question looked to find out to what extent is planetary and social boundaries framework applied in the sustainability publications of the banking companies from CEE region. According to the Figure 2 and Figure 3, the references to planetary and social boundaries framework by the mentioned companies is moderate to low. Only Climate Change topic did receive noticeable attention - from the planetary boundaries category, while from social boundaries we could list Education, Jobs, Income, Gender equality and Health. As a result, most of the planetary and social boundaries were not extensively mentioned in the official publications

of the selected companies. Our results are in line with the ones of Kassier (2024, pp. 18-21) who concluded that corporate social reporting often neglects crucial planetary boundaries.

Analysing the framework by the individual companies, all from CECE BNK EUR index had high counts of Climate Change code usage, while CSOB from Czech Republic registered a lower amount. Figure 5 shows a second planetary boundary code, namely Interference with the nitrogen and phosphorus cycles, with mentions registered in the Erste AG documents. For the other codes linked to social boundaries that had higher count in general usage, Income, Health care and Gender Equality, the current results show that those come mostly from Erste AG, followed by OTP Bank and PKO BP.

The second research question looked to find out if there was a shift in usage, at any moment in time, in regards of planetary and social boundaries from the companies in CEE region. The analysis reveals Climate Change emerged as the code which received the most significant rise in mentions from 2017 to 2023. The category experienced a typical growth pattern from 2017-2018 but then started to rapidly increase its mentions beginning in 2019 until 2023. The launch of the European Union's most ambitious sustainability initiative known as the Green Deal during that year might explain the rising number of climate change mentions. As of this, the initiatives from the framework could have already started to take shape in the Sustainability documents of the companies within the European Union zone. The climate change category is the only one from the nine planetary boundaries which benefited from this increase. The other ones had a low and constant count of mentions throughout the analysed period.

For the social boundaries, Education and Jobs had important increases, with a peak registered in 2022. Education registered a drop followed by a re-acceleration in 2020, while for Jobs category the increase was constantly on an upward trajectory until 2022. From 2022 to 2023, both categories registered a slight decrease. As for Income, Gender Equality and Health Care, there was a slight positive detachment from the rest of categories. For Health Care particularly, the increase can be seen during the COVID 19 pandemic and immediately after (2020-2022), then dropping in line with the other searched categories (from 2022 to present).

The research findings of this study confirm Kassier's (2024) observation that CEE banks maintain sustainability reporting practices which focus on compliance rather than transformation within the planetary boundaries framework. The climate change boundary stands as the main focus in disclosures since 2019 while the EU Green Deal regulatory agenda matches this emphasis instead of showing a comprehensive dedication to ecological stewardship. The social boundaries received priority during the COVID-19 pandemic because they addressed immediate crises but the banks failed to establish lasting strategic social equity commitments.

The longitudinal analysis supports Carroll's (1979) CSR paradigm development by showing that CEE banks use their reporting to follow changing regulatory priorities (such as post-2019 climate focus) instead of making internal ethical decisions. The focus on compliance stands in opposition to Raworth's (2012) concept of businesses as guardians of social and planetary systems.

The research provides original findings about the connection between planetary boundaries and corporate sustainability reporting within the understudied CEE banking sector. This research applied Rockström et al. 's (2009) and Raworth's (2012) frameworks to analyze how banks in transitioning economies handle the conflict between regulatory compliance and systemic sustainability, through longitudinal data.

The research could provide essential value to policymakers and researchers who support integrated sustainability frameworks that unite ecological and social requirements. The study provides essential knowledge about systemic gaps by examining planetary boundaries in a

transforming economic region which establishes groundwork for research on financial institutions' transition from compliance actors to regenerative system catalysts in emerging markets.

Limiting factors like the document threshold are worth to be mentioned. The analysis presents a framework which can serve as a starting point for future research to conduct extended analyses.

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