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Editorial Office: Rzeszów University of Technology, The Faculty of Management,  
10 Powstańców Warszawy Ave., 35-029 Rzeszów, phone: +48 17 8651383, e-mail: [hss@prz.edu.pl](mailto:hss@prz.edu.pl)  
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## FROM THE EDITORIAL COMMITTEE

We are giving you the next 33rd 1 (2026) issue of the scientific journal of the Faculty of Management at the Rzeszów University of Technology entitled „Humanities and Social Sciences”.

The aim of the Publisher is to raise the merits and the international position of the quarterly published by the Faculty of Management, that is why we are still developing the cooperation with foreign team of reviewers, as well as an international Scientific Board. The Editors have also attempted to apply for international databases; currently the HSS journal is indexed in **The Central European Journal of Social Sciences and Humanities (CEJSH), ERIH PLUS, DOAJ and EBSCO.**

The journal „Humanities and Social Sciences” participated in the „Support for scientific journals” program in 2019-2020, and in the „Development of scientific journals” program in 2023-2024, organized by the Ministry of Science and Higher Education.

The articles published in this publication are devoted to the broader issues of the humanities and social sciences. They are the result both of theoretical and empirical research. The subjects covered vary considerably and reflect the interdisciplinary nature of the journal. We do hope that the papers published will meet your kind interest and will be an inspiration to further research and fruitful discussions.

On behalf of the Editorial Board of „Humanities and Social Sciences” we would like to thank the Authors for sending the outcomes of their research. We would like to express particular gratitude to the Reviewers for their valuable feedback that greatly contributed to increasing values of the scientific publications.

With compliments  
*Editorial Committee*



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Michał COMPOREK<sup>1</sup>

## ACCOUNTING CONSERVATISM AND EARNINGS MANAGEMENT: EXPERIENCES FROM THE POLISH CAPITAL MARKET

This study investigates the impact of accounting conservatism on the adopted patterns of earnings management in public companies listed on the Warsaw Stock Exchange. The scope of conditional conservatism was estimated by the occurrence of negative accruals in longer periods and the asymmetry of the relationship between accruals and operating cash flows separately. In turn, the magnitude of earnings manipulation was determined concerning accrual-based and real earnings management behaviours. Our findings confirmed that the magnitude of earnings management in public companies deploying accounting conservatism varies from the extent of earnings manipulation in non-conservative firms. We found that companies applying the prudence concept were, on the one hand, involved in altering earnings downward via accruals, but, on the other hand, they tend to manage earnings upward through real activities. By highlighting how accounting conservatism constrains accrual-based earnings management and signals prudence, our findings can help stakeholders assess managerial behavior, reduce information asymmetry, and evaluate the reliability of reported financial results. The results also highlight how conservative accounting affects both accrual-based and real earnings management in Poland, with variations across sectors, reflecting the country's specific market characteristics.

**Keywords:** accrual-based earnings management, real earnings management, accounting conservatism, Polish capital market.

### 1. INTRODUCTION

Reported earnings are one of the most significant indicators that holistically present a company's economic performance on the capital market. They combine manufacturing specifications (costs) with market conditions (sales volume, product price), constituting an important criterion for making operational decisions in an enterprise. A satisfactory bottom line plays a motivating role in managing a company and affects employment. Furthermore, it enables capital multiplication and increases the company's value, thus becoming a crucial

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<sup>1</sup> Michał Comporek, University of Lodz, Poland; [michal.comporek@uni.lodz.pl](mailto:michal.comporek@uni.lodz.pl). ORCID: 0000-0002-1402-2505.

economic category for diversified groups of stakeholders of the economic entity. However, their accrual nature makes reported earnings susceptible to intentional shaping. Through the implementation of selected accounting policies and operational transactions, it becomes possible to present financial items of the company in an intended light in the eyes of various groups of recipients of reporting data. Although the information needs of insiders and outsiders (including investors, who constitute a privileged group due to providing capital to ensure the company's continued existence and development) may vary and depend on their role in the organization, knowledge, experience, and behavioral characteristics, deploying earnings manipulations causes a depreciation of the qualitative values of the bottom line to all financial statement users.

The category of earnings quality has been the subject of scientific research since 1934 when Graham and Dodd explained the stock valuation model of listed companies using the product of earnings per share (EPS) and a coefficient of quality, which was determined by the dividend policy, the company's financial standing, its reputation, the nature of a business activity, or market sentiment (Graham, Dodd, 1934). Currently, earnings quality can be considered from three research perspectives (Dechow, Ge, Schrand, 2010). The first concerns earnings properties directly referring to the generated profit (loss) levels in subsequent financial years, such as persistence, predictability, degree of smoothness, value relevance, timely loss recognition (accounting conservatism), and the extent of earnings management. The second focuses on investor responsiveness to earnings and is based on relationships between accounting profits, share prices, and rates of return from securities. The third is the result of capturing by an external party some problems with the quality of the reporting data provided (external indicators of earnings misstatements). These proxies involve, *inter alia*, reported internal control procedure deficiencies, restatements, and SEC Accounting and Auditing Enforcement Releases. The mentioned features of earnings quality are not substitutable, do not have to be strongly correlated, and are not characterized by the occurrence of the same nomological network (Licerán-Gutiérrez, Cano-Rodríguez, 2019). However, being an outcome of adopted accounting policies and the effect of subjective managerial choices towards altering earnings, they significantly impact the usefulness of reported earnings in decision-making processes in a company.

This study investigates the impact of accounting conservatism on the adopted patterns of earnings management (EM) behaviors in public companies listed on the Warsaw Stock Exchange (WSE). The scope of conditional conservatism, showing preferences for prudence and striving to eliminate risk in the future, was estimated by two separate analytical approaches. The first one links conservatism with the degree of disclosure of negative accruals in longer periods (Givoly, Hayn, 2007), while the second one is based on assessing the asymmetry of the relationship between accruals and operating cash flows using multiple regression (Ball, Shivakumar, 2005). In turn, the dual dimension of the earnings management phenomenon was illustrated using regression models, which allowed the estimation of the extent of accrual-based (AEM) and real earnings management (REM) activities (Jones, 1991; Dechow, Richardson, Tuna, 2003; Roychowdhury, 2006). By contrasting distinct paths of earnings management (based both on the use of flexibility or discretion in financial reporting, a certain degree of freedom in interpreting the provisions of the balance sheet law, and the structuring and temporal coordination of economic operations), we follow the relevant trend of research on the mechanisms and factors altering earnings in public companies.

This paper provides a novel perspective on how EM estimates obtained through a cross-sectional approach (regressions executed separately for each industry and year) and a time-

series data approach (regressions at the level of individual enterprises) influence the relationship between EM and accounting conservatism. Unlike previous studies, which primarily focus on highly developed economies (Ball, Shivakumar, 2005; Garcia Lara, Garcia Osma, Penalva, 2019; Bryan, McKnight, Houmes, 2021) or major Asian markets due to their economic potential (Zadeh, Askarany, Asl, 2022; Hartam, Kresnawati, 2022), our study fills a significant research gap by examining this relationship in a less explored setting – the Polish capital market. By doing so, we contribute to the literature by providing empirical evidence from a transition economy, where institutional frameworks, investor protection mechanisms, and financial reporting incentives may differ from those in more established markets. This allows for a deeper understanding of how accounting conservatism interacts with earnings management in an environment with evolving corporate governance structures and regulatory landscapes. The Polish capital market operates within a post-transition economy and remains less developed than the leading European markets. We observe this particularly in terms of market depth, liquidity, and the limited role of equity and debt securities in corporate financing. A relatively low level of household savings, weak long-term investment activity, and declining participation of both individual and institutional investors shape the institutional environment in which Polish listed companies operate. Although the Polish market has gained importance in Central and Eastern Europe and was reclassified as a developed market by FTSE Russell in 2018, the Warsaw Stock Exchange still shows lower capitalization, reduced liquidity, and a declining number of listed firms compared to major European exchanges (Artienwicz et al., 2020). We argue that these features, together with concentrated ownership structures and relatively weaker external monitoring mechanisms, affect managerial incentives and financial reporting behavior. As a result, the role of accounting conservatism and earnings management in Poland may differ from that observed in more mature capital markets. Therefore, empirical findings from developed economies cannot be directly transferred to the Polish context without accounting for its specific institutional and market characteristics.

The manuscript is organized as follows: The first section contains a literature review concerning the terminology and methodological dilemmas related to evaluating the scope of EM and accounting conservatism in listed companies. It also describes and develops the hypotheses. The second section covers the research design and data. The third section includes the findings and a discussion of the empirical results. Finally, the last section contains the conclusion, limitations, and directions for future research. Furthermore, research on the relationship between earnings management and accounting conservatism is significant because it provides valuable insights into the trade-offs firms face when managing earnings while adhering to conservative accounting practices. Understanding these dependencies helps regulators, investors, and analysts assess the credibility of financial statements and identify potential earnings manipulation. Additionally, it contributes to the broader discussion on corporate transparency and governance, shedding light on whether conservatism mitigates or exacerbates opportunistic managerial behavior in financial reporting.

## **2. LITERATURE REVIEW**

### **2.1. Earnings management – patterns and motivations**

As noted by Healy and Wahlen (1999), earnings management (EM) occurs when executives exercise judgment in financial reporting and in structuring transactions to

modify financial reports, either to mislead certain stakeholders regarding the company's underlying economic performance or to influence contractual outcomes dependent on reported accounting figures. In other words, EM encompasses practices that deviate from a faithful representation of financial profit (or loss), as known to management, and that would otherwise be reported in the absence of predetermined financial targets achieved through creative interpretation of accounting principles and a flexible approach to recording, processing, and presenting economic transactions. From the perspective of its impact on reported earnings, EM can be categorized into three types: (1) deliberate understatement of earnings, often associated with accounting conservatism; (2) intentional overstatement of financial results, linked to aggressive accounting practices; and (3) neutral activities, which do not ultimately influence earnings, as they do not introduce additional adjustments to the reported results.

According to Beneish (2001), key motivations for earnings overstatement include executive compensation contracts, executed or planned credit agreements, the issuance of corporate securities on the capital market—particularly in the period preceding initial public offerings (IPOs), where issuers often appear financially stronger than subsequently reflected in post-listing financial reports—and insider trading, where managers leverage privileged information to maximize personal gains. Conversely, incentives for earnings understatement primarily involve upcoming negotiations with trade unions and planned management buyouts (MBOs), where reducing reported profits can lead to more favorable acquisition terms for managers taking ownership of the company.

By integrating EM classifications with reporting practices, the literature commonly distinguishes between accrual-based earnings management (AEM) and real earnings management (REM). AEM primarily relies on the flexibility and discretion inherent in financial reporting and the interpretation of accounting regulations (Stolowy, Breton, 2004). This form of earnings management involves adjusting accounting principles and estimates, such as depreciation methods, capitalization policies for research and development (R&D) expenditures, provisions and reserves, and discretionary estimations related to bad debts, pension liabilities, and inventory write-downs (Callao, Jarne, Wróblewski, 2014). In contrast, REM is characterized by the strategic structuring of business transactions to influence financial statements in advance (Kabaciński, Mizerka, Stróżyńska-Szajek, 2022). As Roychowdhury (2006) points out, REM deviates from standard operational practices and is primarily motivated by managerial efforts to create the appearance of achieving financial targets through routine business activities. Huang and Sun (2017) highlight that REM can be executed through inventory overproduction (to reduce the cost of goods sold) or the reduction of discretionary expenses to temporarily boost reported margins. Additional REM techniques include artificially accelerating sales by channel stuffing (i.e., pushing excess inventory into distribution channels), share buybacks to enhance earnings per share (EPS) metrics (“shrink the ship” strategy), and asset liquidations or selective portfolio adjustments to manipulate financial performance indicators (McKee, 2005).

## **2.2. Earnings management – patterns and motivations**

Accounting conservatism, also referred to as the prudence concept, pertains to the valuation of assets, liabilities, and financial results, ensuring the neutrality of financial reporting by mitigating the risk of overstating or understating economic outcomes (Conceptual Framework for Financial Accounting, 2018). While accounting standards

such as IAS/IFRS provide detailed guidance on its application, the concept itself is subject to varying interpretations across different regulatory frameworks.

The literature distinguishes between unconditional and conditional conservatism. Unconditional conservatism, as outlined by Givoly and Hayn (2007), results in a systematic understatement of net assets due to inherent accounting principles, including historical cost accounting and the going concern assumption (Beaver, Ryan, 2005). This form of conservatism is reflected in practices such as accelerated depreciation, immediate expensing of discretionary expenditures, LIFO inventory valuation, and the creation of excess reserves. Conversely, conditional conservatism is characterized by the asymmetric recognition of economic gains and losses, whereby losses are recognized more promptly than gains, and a higher verification threshold is required for recognizing favorable economic events (Basu, 1997). This approach is evident in areas such as goodwill impairments and the valuation of long-lived assets. While both forms lead to a systematic understatement of net asset values, they exert differing effects on financial performance, with unconditional conservatism exerting a persistent impact on earnings, whereas conditional conservatism's influence fluctuates depending on economic conditions and reporting periods (Ruch, Taylor, 2015; Chen, Folsom, Paek, Sami, 2014).

The implementation of accounting conservatism remains a subject of debate. Proponents emphasize its role in mitigating litigation risks, reducing information asymmetry, and enhancing corporate governance by constraining managerial discretion in financial reporting (Watts, 2003; Hejranijamil, Hejranijamil, Shekarkhah, 2020; Zhong, Li, 2017). Additionally, it is associated with improved investment efficiency and a lower risk profile for financial stakeholders. However, critics argue that conservatism may distort the matching principle by misaligning revenue and expense recognition, thereby limiting the informational value of financial statements. The measurement of conservatism in financial reporting has been approached through various analytical frameworks. These include the examination of asymmetric recognition of economic news (Basu, 1997), the relationship between accruals and operating cash flows (Ball, Shivakumar, 2005), the presence of hidden reserves (Penman, Zhang, 2002), and discrepancies between book and market valuations of firms (Beaver, Ryan, 2000). These methodologies provide a basis for assessing the extent to which conservatism influences financial reporting practices and its broader implications for stakeholders.

### **2.3. Accounting conservatism and earnings management – a reference to previous research**

Prior research has extensively examined the relationships between AEM and accounting conservatism. Studies have investigated the connections between these two proxies of earnings quality, both directly and while considering additional moderating variables. Penman and Zhang (2002) and Jackson and Liu (2010) provided evidence that the application of unconditional conservatism contributes to the creation of hidden reserves, which, when released into income, distort reported performance. This process allows for the manipulation of earnings downward. Bryan et al. (2021) used the allowance for doubtful accounts and write-offs of uncollectible accounts as proxies for accounting conservatism. They demonstrated that companies seek to increase their bad debt expense or implement a “big bath” technique to create an excessive allowance for doubtful accounts. In contrast, companies with earnings aligned with analysts' forecasts tend to reduce their bad debt expense.

Zadeh et al. (2022) found significant and negative relationships between accounting conservatism and AEM. They argue that conservative accounting practices may generate skepticism among external report recipients, leading them to perceive these practices as earnings manipulation. Furthermore, they documented that the relationship between AEM and conditional conservatism could be contingent upon board independence and the ownership of large shareholders. Similarly, Ardiany, Lukviarman, Hamidi and Luthan (2023) noted that accounting conservatism mitigates the impact of board diligence, ownership concentration, and CEO ownership on earnings management (EM), although their findings are specific to the banking sector. Hartam and Kresnawati (2022) confirmed a negative relationship between accounting conservatism and EM behaviors among companies listed on the Indonesia Stock Exchange. Moreover, they revealed that the corporate life cycle moderates the relationship between earnings quality and accounting conservatism, indicating that the more advanced the life cycle of the company, the stronger the impact of conservatism on earnings management.

Haque, Fatima, Abid and Qamar (2019) explored the effect of accounting conservatism on AEM under conditions of uncertainty. They found that, during uncertain periods, companies are more likely to engage in EM, but accounting conservatism effectively reduces earnings manipulation, ultimately improving the company's value. Garcia Lara et al. (2020) further provided evidence that accounting conservatism constrains opportunistic behavior by managers in relation to AEM. They argue that conservatism introduces additional costs to earnings management, thus reducing the likelihood of managers engaging in AEM to meet or exceed earnings benchmarks or analyst forecasts. Garcia Lara et al. (2020) also pointed out that conservatism limits earnings manipulation through accruals but may encourage managers to turn to real earnings management (REM) practices. This relationship has been confirmed by earlier studies by Demski (2004) and Ewert and Wagenhofer (2005), which suggested that a shift from AEM to REM could occur as a result of accounting conservatism.

Yuan, Zeng, Yuan and Lan (2022), applying the Roychowdhury methodology, showed that REM activities significantly negatively impact the scope of accounting conservatism. Their findings indicate that in companies with weaker corporate governance, REM has a more pronounced effect on accounting conservatism compared to companies with stronger governance practices. Similarly, Li (2018) confirmed that unconditional conservatism is closely associated with REM practices. These results apply to all aggregated REM measures used in the study. Furthermore, in Chinese public companies, the prudence concept is negatively correlated with REM, after controlling for internal control quality and audit risks. Li (2019) also observed that accounting conservatism reduces innovation inputs, particularly in terms of R&D expenditures.

Building on these empirical findings from other markets, we interpret the relationship between accounting conservatism and earnings management through several economic theories. From the perspective of agency theory, conflicts may arise between shareholders and managers, as executives might use accrual-based earnings management to increase personal gains at the expense of owners (Nguyen et al., 2022; Park et al., 2021). Accounting conservatism, by recognizing losses promptly and deferring gains, limits managers' discretion and helps reduce such agency conflicts. By restricting opportunities for opportunistic reporting, conservative practices align managerial actions more closely with shareholder interests. Firms also use accounting choices to signal reliability and quality to external stakeholders (Čornanič, Novák, 2015). In this context, conservatism acts as a credible signal of financial prudence, which can reduce managers' incentives to

manipulate earnings. Managers are naturally loss-averse but may take bigger risks under threat of losses (Kahneman, Tversky, 2013); early recognition of losses moderates risky accrual manipulations, although operational earnings management may still occur under pressure. Conservatism can thus serve as both a preventive and a stabilizing mechanism, signaling to the market that the firm exercises caution while still allowing room for strategic operational decisions. Accounting conservatism also strengthens credibility with investors, banks, and suppliers, lowering the incentive for accrual-based manipulation while supporting operational decisions to meet external expectations (Callen et al., 2016). Moreover, it helps stakeholders interpret financial results more reliably, reducing uncertainty and enhancing trust in the firm's reporting. Finally, firms adopt conservative practices to maintain legitimacy with regulators, investors, and the public, demonstrating responsible financial reporting (Suchman, 1995). Overall, conservatism constrains accrual-based earnings management, protects reputation, ensures continued legitimacy, and fosters greater confidence among both internal and external stakeholders.

However, we believe these mechanisms may work a bit differently in the Polish capital market. The market has lower liquidity, concentrated ownership, and weaker external monitoring (Artienwicz et al., 2020). This can shift conflicts more toward controlling versus minority shareholders. At the same time, the signaling and legitimacy roles of conservative accounting become more important. As a result, while conservatism may still limit accrual-based earnings management, firms in Poland may rely more on operational earnings management. This reflects the specific features of a post-transition economy. Based on these interpretations and by transferring findings from other markets to the Polish capital market, we formulate the following hypotheses:

- H.1. The extent of earnings management in public companies applying accounting conservatism is statistically different from the extent of earnings management in other business entities included in the sample.
- H.2. The dominant form of earnings management practices in listed companies that apply the accounting prudence concept is managing earnings downward.

### 3. METHODOLOGY

#### 3.1. Data collection

The research sample used in this paper comprises 217 companies whose shares were traded in the Main Market of the WSE from 2014 to 2023. Companies in the banking and insurance industries (WSE codes 110 and 120) were excluded due to discrepancies in financial reporting templates. Additionally, all companies have a fiscal year ending on 31 December, report income statements by function, and all necessary financial data is publicly available. All calculations were prepared based on information from the Notoria Serwis SA database. In this research, we use the WSE's sectoral classification for issuers. The 3-digit level classification system categorises companies into eight main groups (state administration was excluded from the sample) with further subsectors.

#### 3.2. Earnings management measures

The magnitude and direction of AEM activities are estimated by the Dechow et al. model (2003). It presupposes that endogenous variable (TACC) as a function of the change in cash-accompanying revenue ( $\Delta REV - \Delta REC$ ), showing changes in current accruals and depreciation expenses (PPE), controlling for any nondiscretionary accruals changes related to depreciation expenses (Equation 1). Moreover, in its analytical formula, the Dechow et

al. model (2003) involves a slope coefficient  $k$  that captures the expected change in accounts receivable for a given change in sales. If  $k = 1$ , the annual change in accounts receivable is nondiscretionary, whereas if  $k = 0$ , it is discretionary (Comporek, 2024). The inclusion of the slope coefficient  $k$  removes the weakness of the Modified Jones model for extracting subcategories of accruals (Dechow, Sloan, Sweeney, 1995), which assumes that any increase in receivables should be treated as discretionary, which is inconsistent with business practice. The following regression evaluates the slope coefficient  $k$  as a parameter (Equation 2).

$$\frac{TACC_t}{TA_{t-1}} = \alpha_1 \left( \frac{1}{TA_{t-1}} \right) + \alpha_2 \left( \frac{(1+k) * \Delta REV_t - \Delta REC_t}{TA_{t-1}} \right) + \alpha_3 \left( \frac{PPE_t}{TA_{t-1}} \right) + \alpha_4 \frac{TACC_{t-1}}{TA_{t-2}} + \varepsilon_t \quad (1)$$

$$\Delta REC_t = \alpha_1 + k * \Delta REV_t + \varepsilon_t \quad (2)$$

Where:  $TACC_t$  – total accruals in period  $t$  (determined by the balance sheet approach);  $TA_t$  – total assets in year  $t$ ;  $REV_t$  – revenues from sales in year  $t$ ;  $REC_t$  – net receivables in year  $t$ ;  $PPE_t$  – gross property, plant and equipment in year  $t$ ;  $k$  – slope coefficient evaluating the expected change in accounts receivable for a given change in sales in period  $t$ ;  $\alpha_1, \alpha_2, \alpha_3$  – a firm-specific parameter (in the regression model);  $\varepsilon_t$  – a random error.

The extent of REM is estimated through the Roychowdhury methodology (2006). Firstly, using the regression models presented in Equations 3–5, we computed three basic proxies of REM, including abnormal levels of cash flow from operations ( $abn\_OCF$ ) (Equation 3), abnormal production costs ( $abn\_PROD$ ) (Equation 4) and abnormal discretionary expenses ( $abn\_DISX$ ) (Equation 5). The REM proxy is the residual from the utilized regression model in each case.

$$\frac{OCF_t}{TA_{t-1}} = \alpha_1 \left( \frac{1}{TA_{t-1}} \right) + \alpha_2 \left( \frac{REV_t}{TA_{t-1}} \right) + \alpha_3 \left( \frac{\Delta REV_t}{TA_{t-1}} \right) + \varepsilon_t \quad (3)$$

$$\frac{PROD_t}{TA_{t-1}} = \alpha_0 + \alpha_1 \left( \frac{1}{TA_{t-1}} \right) + \alpha_2 \left( \frac{REV_t}{TA_{t-1}} \right) + \alpha_3 \left( \frac{\Delta REV_t}{TA_{t-1}} \right) + \alpha_4 \left( \frac{\Delta REV_{t-1}}{TA_{t-1}} \right) + \varepsilon_t \quad (4)$$

$$\frac{DISX_t}{TA_{t-1}} = \alpha_1 \left( \frac{1}{TA_{t-1}} \right) + \alpha_2 \left( \frac{REV_{t-1}}{TA_{t-1}} \right) + \varepsilon_t \quad (5)$$

Where:  $OCF_t$  – cash flow from operations in year  $t$ ;  $PROD_t$  – production costs (including: cost of goods sold and value of goods and materials sold at purchase prices increased by a change in inventories) in year  $t$ ;  $DISX_t$  – discretionary expenses (including SG&A expenses) in year  $t$ ; other designations – as above.

In the next step, we develop aggregate REM indicators (REM1, REM2 and REM3), holistically illustrating the magnitude of REM in tested companies. The higher values of aggregated REM measures yield higher upward activity-based earnings manipulation within a company (Habib, Ranasinghe, Wu, Biswas, Ahmad, 2022). The analytical formula REM1 is the sum of three standardized metrics of REM and takes the following form (Equation 6). The sum of  $abn\_PROD$  and  $abn\_DISX$  is identified as REM2 (Equation 7). Finally, the sum of  $(-1 * abn\_CFO)$  and  $(-1 * abn\_DISX)$  is specified as REM3 (Equation 8) (Cohen, Dey, Lys, 2008).

$$REM1_t = -abn\_OCF_t + abn\_PROD_t - abn\_DISX_t \quad (6)$$

$$REM2_t = abn\_PROD_t - abn\_DISX_t \quad (7)$$

$$REM3_t = -abn\_OCF_t - abn\_DISX_t \quad (8)$$

Where:  $REM1_t$  – the aggregate of standardised  $abn\_CFO$  multiplied by negative one, standardised  $abn\_PROD$  and standardised  $abn\_DISX$  multiplied by negative one in year  $t$ ;  $REM2_t$  – the aggregate of standardised  $abn\_PROD$  and standardised  $abn\_DISX$  multiplied by negative one in year  $t$ ;  $REM3_t$  – the aggregate of standardised  $abn\_CFO$  multiplied by negative one and standardised  $abn\_DISX$  multiplied by negative one in year  $t$ .

### 3.3. Accounting conservatism measures

Following Givoly and Hayn (2007) and Ball and Shivakumar (2005), we estimate accounting conservatism based on the relationship between net income and operating cash flows and asymmetry in recognizing good and bad news. In the first case, we evaluate conservatism with the accrual method (Equation 9) (Ahmed, Duelman, 2007; Zadeh et al., 2022). When negative accruals appear in the company's financial statements for a long time, the company can be considered as an accounting conservative. The rate of change in negative accruals indicates a modification of the degree of conservatism (Givoly, Hayn, 2007). In this approach, the CONS1 values were averaged for the entire research period of 2014-2023, and the premise for such a solution was, on the one hand, the mitigation of potentially large accruals reported in single fiscal years, and on the other hand - the belief that accruals tend to reverse in one or two consecutive accounting years (Richardson, Sloan, Soliman, Tuna, 2005).

$$CONS1 = \frac{EAT_t - CFO_t + DEP_t}{TA_t} \times (-1) \quad (9)$$

Where: CONS1 – accounting conservatism indicator;  $EAT_t$  – earnings after taxes in year  $t$ ;  $DEP_t$  – amortization and depreciation in year  $t$ ; other designations – as above.

The second approach computed the degree of accounting conservatism using the Ball and Shivakumar model (2005) (Equation 10). It is assumed that the asymmetric relationship between cash flows and accruals arises because economic losses are recognized in a more timely manner than economic gains (Ball, Shivakumar, 2005). Hence, this solution resembles the methodological proposal of Basu (1997), but it can also be applied to unlisted companies (no requirement to take into account stock returns).

According to the Ball and Shivakumar (2005) methodology, conservatism ratio CONS2 equals the value of the parameter  $\alpha_4$  (the higher its value, the greater the tendency of the company to consider bad news faster than good news).

$$\begin{aligned} \frac{TACC_t}{TA_{t-1}} = & \alpha_1 \left( \frac{1}{TA_{t-1}} \right) + \alpha_2 \left( \frac{NOCF_t}{TA_{t-1}} \right) + \alpha_3 \left( \frac{OCF_t}{TA_{t-1}} \right) \\ & + \alpha_4 \left( \frac{NOCF_t}{TA_{t-1}} \right) \times \left( \frac{OCF_t}{TA_{t-1}} \right) + \varepsilon_t \end{aligned} \quad (10)$$

Where:  $NOCF_t$  – dummy variable (equal to 1 when operating cash flows in year t were negative and 0 in other cases); other designations – as above.

### 3.4. Other calculations

The statistical assessment of earnings management (EM) among conservative and non-conservative companies is based on the Student's t-test for independent samples and the non-parametric Mann-Whitney U test. The empirical investigation also employed descriptive statistics and tests of statistical significance. To provide a comprehensive view, we applied both a cross-sectional approach, comparing companies across sectors and years, and a time-series data approach, examining individual firms over the period 2014–2023. While the reliance on cross-sectional analysis introduces some limitations, the combination of both approaches and winsorization of variables at the 1% and 99% levels ensures that the results remain robust and reliable (Li et al., 2024). Panel regression models were not applied because CONS1 and CONS2 were calculated as averages over the entire research period, limiting within-firm variation necessary for dynamic analysis, and preliminary diagnostics indicated that the DACC and REM variables did not satisfy key assumptions of linear regression (Eden et al., 2022; El Ghouli et al., 2022). All calculations were performed using PS IMAGO PRO software.

## 4. RESULTS AND DISCUSSION

The first step of the empirical investigation examined AEM behaviors in companies that apply accounting conservatism and those that do not. The extent and direction of AEM practices were estimated separately using both a cross-sectional approach (regressions for individual WSE sectors and years) and a time-series data approach (regressions at the level of individual companies). Table 1 presents descriptive statistics for discretionary accruals (DACC) calculated for the two compared subpopulations. It also shows the results of t-Student and Mann-Whitney U tests regarding the statistical differentiation of DACC variables between companies implementing and not implementing accounting conservatism (evaluated by the CONS1 and CONS2 indicators).

The empirical research, using cross-sectional analysis, indicates that the DACC variable has a statistically significantly lower value in the conservative group compared to non-conservative companies. However, this finding is only confirmed when estimating the scope of accounting conservatism through the accrual approach (CONS1). When evaluating conservatism based on the asymmetry in recognizing good and bad news (CONS2), statistical differentiation of the medians of the absolute values of the DACC variable was observed. The results of Levene's test for variance homogeneity suggest that, in the time-series data approach, statistical inference should primarily rely on

nonparametric Mann-Whitney U tests. It is important to highlight that, when analyzing individual public companies based on the CONS1 ratio, statistical differentiation of the absolute values of DACC variables was observed. In general, although the predominant form of earnings manipulation through accruals in public companies applying accounting conservatism was the tendency to manipulate earnings downward, the scope of AEM practices in these companies was greater than in non-conservative firms.

Table 1. Descriptive statistics and results of tests describing the variance of discretionary accruals in accounting conservative and non-conservative companies

DACC*								
Measure	Cross-sectional approach				Time-series data approach			
	Conservatism		p-value	Levene	Conservatism		p-value	Levene
CONS1	No N=1257	Yes N=913			No N=1257	Yes N=913		
Mean	0.008	-0.008	<b>0.001</b>	0.534	-0.001	-0.003	0.884	0.001
Median	0.005	-0.007	<b>0.002</b>		0.002	0.001	0.850	
St. Dev.	0.125	0.280			0.080	0.102		
CONS2	Conservatism		p-value	Levene	Conservatism		p-value	Levene
	No N=1371	Yes N=799			No N=1371	Yes N=799		
Mean	0.005	0.042	0.377	0.087	-0.002	0.000	0.560	0.635
Median	-0.001	0.002	0.149		0.002	0.001	0.948	
St. Dev.	0.193	0.227			0.092	0.085		
DACC *								
Measure	Cross-sectional approach				Time-series data approach			
	Conservatism		p-value	Levene	Conservatism		p-value	Levene
CONS1	No N=1257	Yes N=913			No N=1257	Yes N=913		
Mean	0.074	0.077	0.245	0.893	0.055	0.068	<b>0.001</b>	0.001
Median	0.100	0.110	0.293		0.037	0.042	<b>0.007</b>	
St. Dev.	0.096	0.262			0.058	0.076		
CONS2	Conservatism		p-value	Levene	Conservatism		p-value	Levene
	No N=1371	Yes N=799			No N=1371	Yes N=799		
Mean	0.073	0.079	0.085	0.257	0.061	0.059	0.328	0.021
Median	0.051	0.056	<b>0.038</b>		0.038	0.042	0.315	
St. Dev.	0.171	0.208			0.069	0.061		

\* All variables are winsorized at the 1% and 99% levels to mitigate the effect of possible outliers.

Source: own elaboration.

A similar research procedure was conducted for aggregate REM measures to examine the magnitude and the paths of activity-based earnings manipulation in the tested

population (Table 2). In most of the analyzed cases, statistical differences were observed in the values of REM1, REM2, and (partially) REM3 proxies between companies that implemented the prudence principle and those that did not. Interestingly, companies that applied accounting conservatism exhibited a greater scope of REM activities. However, this finding was only evident when estimating REM using a cross-sectional approach. In contrast, when assessing the extent of real earnings manipulation using Roychowdhury's methodology and time-series data, no statistically significant differences were found between the groups in terms of aggregated REM measures.

Table 2. Descriptive statistics and results of tests describing the variance of aggregated REM measures in accounting conservative and non-conservative companies.

REM1*								
Measure	Cross-sectional approach				Time-series data approach			
	Conservatism		p-value	Levene	Conservatism		p-value	Levene
CONS1	No N=1256	Yes N=914			No N=1256	Yes N=914		
Mean	-0.013	0.027	<b>0.001</b>	0.185	0.000	0.001	0.726	0.050
Median	0.007	0.036	<b>0.001</b>		0.000	0.001	0.708	
St. Dev.	0.231	0.223			0.066	0.072		
CONS2	Conservatism		p-value	Levene	Conservatism		p-value	Levene
	No N=1374	Yes N=796			No N=1374	Yes N=796		
Mean	-0.008	0.024	<b>0.001</b>	0.161	0.000	0.000	0.819	0.033
Median	0.005	0.045	<b>0.001</b>		0.001	-0.001	0.675	
St. Dev.	0.230	0.225			0.067	0.072		
REM2*								
Measure	Cross-sectional approach				Time-series data approach			
	Conservatism		p-value	Levene	Conservatism		p-value	Levene
CONS1	No N=1256	Yes N=914			No N=1256	Yes N=914		
Mean	-0.014	0.030	<b>0.001</b>	0.074	0.000	0.000	0.841	0.293
Median	0.000	0.030	<b>0.001</b>		0.001	0.001	0.726	
St. Dev.	0.199	0.186			0.045	0.045		
CONS2	Conservatism		p-value	Levene	Conservatism		p-value	Levene
	No N=1374	Yes N=796			No N=1374	Yes N=796		
Mean	-0.003	0.016	<b>0.015</b>	0.056	0.000	0.000	0.426	0.515
Median	0.005	0.020	<b>0.012</b>		0.005	0.015	0.300	
St. Dev.	0.199	0.186			0.045	0.045		

Table 2 (cont.). Descriptive statistics and results of tests describing the variance of aggregated REM measures in accounting conservative and non-conservative companies.

REM3*								
Measure	Cross-sectional approach				Time-series data approach			
	Conservatism		p-value	Levene	Conservatism		p-value	Levene
CONS1	No N=1256	Yes N=914			No N=1256	Yes N=914		
Mean	-0.002	0.007	0.071	0.663	0.000	0.000	0.973	0.009
Median	0.009	0.019	0.107		0.000	0.001	0.683	
St. Dev.	0.135	0.138			0.057	0.063		
CONS2	Conservatism		p-value	Levene	Conservatism		p-value	Levene
	No N=1374	Yes N=796			No N=1374	Yes N=796		
Mean	-0.004	0.011	<b>0.012</b>	0.734	0.000	0.001	0.655	0.005
Median	0.005	0.025	<b>0.002</b>		0.000	0.000	0.759	
St. Dev.	0.135	0.138			0.057	0.064		

\* All variables are winsorized at the 1% and 99% levels to mitigate the effect of possible outliers.

Source: own elaboration.

The cross-industry analysis of discretionary accruals in the tested subsamples supports the findings of Garcia-Lara et al. (2020), Zadeh et al. (2022), and Kresnawati et al. (2022), highlighting the negative impact of accounting conservatism on AEM. However, our study underscores the importance of the method used to estimate conservatism in public companies. The empirical results varied depending on whether conservatism was assessed using the accrual approach or through the asymmetry between total accruals and operational cash flows. Conversely, the method of estimating conservatism had little impact on the relationship with REM. These findings diverge from those of Li (2018) and Yuan et al. (2022), as public companies applying accounting conservatism in the Polish market tended to manage earnings upward. Therefore, our results positively support the first hypothesis (H.1), which suggests that the magnitude of EM in public companies applying accounting conservatism differs statistically from the scope of EM in other joint-stock enterprises in the sample. However, we found no clear evidence to support the second hypothesis (H.2), which posits that the dominant EM practice in listed companies applying conservatism is managing earnings downward. The most statistically significant results emerged from cross-sectional regressions analyzing subcategories of accruals and activity-based EM measures. However, this approach has limitations. Bagnoli and Watts (2020) note that analyzing data from a single point in time may overstate nondiscretionary accruals, leading to an underestimation of abnormal accruals. Additionally, the time-series data approach in this study did not allow for meaningful comparisons of EM scale and direction across subpopulations. Consequently, subsequent empirical research relied solely on cross-sectional analyses for years and industries.

To further examine the relationship between accounting conservatism and EM, we assessed the statistical distribution of the DACC and REM1 proxies based on CONS1 and CONS2 values. Following Ecker, Francis, Olsson and Schipper (2013), we grouped public

firms into relatively homogeneous subsamples to better capture EM patterns. Specifically, companies were divided into ten subsamples based on their level of conservatism (deciles 1–10, with decile 1 representing the lowest and decile 10 the highest level of conservatism). Table 3 presents descriptive statistics for the distribution of DACC and REM1 proxies extracted from cross-sectional analysis for each group. Notably, the average values of abnormal accruals (DACC) were positive in the first five subpopulations (deciles 1–5) and negative in the next five (deciles 6–10). Conversely, the trend for the REM1 measure was largely opposite, except for decile 1.

Table 3. Descriptive statistics of DACC and REM1 proxies according to the CONS1 and CONS2 values divided into deciles.

Specification	Measure	DACC		Measure	REM1	
		CONS1	CONS2		CONS1	CONS2
1st group	Mean	0.008	0.002	Mean	0.017	-0.003
	Median	0.004	0.000	Median	0.013	-0.010
	St. Dev.	0.106	0.124	St. Dev.	0.163	0.218
2nd group	Mean	0.018	0.003	Mean	-0.025	0.002
	Median	0.012	-0.005	Median	0.009	0.034
	St. Dev.	0.112	0.119	St. Dev.	0.224	0.237
3th group	Mean	0.004	0.001	Mean	-0.018	0.079
	Median	-0.003	0.001	Median	-0.006	0.072
	St. Dev.	0.113	0.135	St. Dev.	0.263	0.200
4th group	Mean	0.005	0.005	Mean	-0.029	0.009
	Median	0.005	0.007	Median	0.012	0.037
	St. Dev.	0.113	0.087	St. Dev.	0.236	0.236
5th group	Mean	0.015	-0.003	Mean	-0.035	-0.093
	Median	0.008	-0.007	Median	-0.012	-0.084
	St. Dev.	0.087	0.082	St. Dev.	0.239	0.229
6th group	Mean	-0.001	-0.004	Mean	0.003	0.005
	Median	-0.007	-0.001	Median	0.028	0.007
	St. Dev.	0.102	0.073	St. Dev.	0.281	0.220
7th group	Mean	-0.003	-0.005	Mean	0.024	0.045
	Median	-0.007	-0.007	Median	0.020	0.060
	St. Dev.	0.101	0.108	St. Dev.	0.218	0.225
8th group	Mean	-0.001	0.016	Mean	0.015	0.024
	Median	0.000	0.013	Median	0.019	0.058
	St. Dev.	0.114	0.117	St. Dev.	0.219	0.270
9th group	Mean	-0.018	-0.001	Mean	0.030	-0.005
	Median	-0.011	-0.002	Median	0.057	0.018
	St. Dev.	0.100	0.108	St. Dev.	0.212	0.209
10th group	Mean	-0.011	0.001	Mean	0.051	-0.015
	Median	-0.009	0.005	Median	0.048	0.011
	St. Dev.	0.114	0.104	St. Dev.	0.202	0.199

Source: own elaboration.

The next step of the empirical investigation analyzed earnings management (EM) behaviors across industries classified according to the WSE (Table 4).

Table 4. Descriptive statistics of DACC and REM1 proxies in accounting conservative and non-conservative companies: a cross-sectoral analysis.

Industry	Measure	DACC				REM1			
		CONS1		CONS2		CONS1		CONS2	
		No	Yes	No	Yes	No	Yes	No	Yes
Finance	Mean	0.016	-0.023	-0.005	0.002	0.018	-0.036	-0.031	0.024
	Median	0.002	-0.014	-0.007	0.000	-0.022	-0.042	-0.045	0.000
	St. Dev.	0.115	0.134	0.138	0.109	0.183	0.234	0.208	0.205
Fuels and energy	Mean	-0.006	0.013	-0.005	0.010	0.016	-0.027	-0.032	0.057
	Median	0.001	0.009	0.001	0.002	0.022	-0.017	-0.015	0.044
	St. Dev.	0.072	0.045	0.057	0.075	0.084	0.110	0.100	0.054
Chemistry and raw materials	Mean	0.013	-0.001	0.006	0.002	0.021	-0.014	0.000	0.001
	Median	0.007	-0.005	-0.004	0.009	0.049	-0.008	0.005	0.027
	St. Dev.	0.092	0.092	0.094	0.088	0.179	0.167	0.163	0.191
Industrial production, construction, assembly	Mean	0.012	-0.012	0.005	0.001	-0.042	0.078	-0.009	0.010
	Median	0.006	-0.008	0.006	-0.004	-0.013	0.083	-0.004	0.042
	St. Dev.	0.112	0.133	0.115	0.126	0.231	0.228	0.233	0.242
Consumer goods	Mean	0.014	-0.008	-0.002	0.020	0.007	0.074	0.031	0.042
	Median	0.009	-0.012	-0.002	0.023	0.072	0.107	0.105	0.091
	St. Dev.	0.086	0.089	0.087	0.090	0.307	0.276	0.312	0.259
Trade and services	Mean	-0.001	0.001	-0.001	0.001	-0.002	-0.006	-0.042	0.081
	Median	0.000	-0.007	-0.009	0.003	0.011	0.033	-0.034	0.142
	St. Dev.	0.120	0.097	0.108	0.120	0.262	0.244	0.239	0.271
Health protection	Mean	0.005	0.004	0.004	0.043	-0.154	0.078	0.010	-
	Median	0.006	0.003	0.003	0.032	-0.236	0.080	0.057	-
	St. Dev.	0.069	0.052	0.057	0.038	0.287	0.139	0.220	-
Technologies	Mean	-0.014	-0.007	-0.016	-0.001	0.015	-0.027	-0.015	0.020
	Median	0.004	-0.008	-0.005	0.010	0.033	-0.006	0.009	0.011
	St. Dev.	0.116	0.093	0.111	0.100	0.170	0.210	0.201	0.162

Source: own elaboration.

Based on calculations using the CONS1 ratio, opposite patterns of accrual earnings management (AEM) were observed in two sectors: fuels and energy, and trade and services. In these sectors, accounting-conservative companies exhibited positive values of

the DACC variable, while the remaining firms tended to manage earnings downward through accruals. Additionally, the average DACC values for companies in the health protection and technologies sectors showed similar patterns, regardless of whether the prudence principle was applied.

In terms of estimates based on the asymmetry between total accruals and operating cash flows (CONS2), it is worth noting that conservative companies in the health protection and consumer goods sectors exhibited above-average abnormal accruals. The method used to assess accounting conservatism had a significant impact on evaluating the scope of real earnings management (REM) across industries. Only in the industrial production, construction, assembly, and consumer goods industries did the directions of earnings manipulation through real activities align between the CONS1 and CONS2 estimates. In contrast, for companies in the health protection sector, no evidence was found to support the application of accounting conservatism when assessed through the asymmetry in recognizing good and bad news.

The empirical research examined the relationships between earnings management (EM) and accounting conservatism in companies listed on the Warsaw Stock Exchange, taking into account various industries and methods of assessing conservatism. The results indicate that the adopted method of estimating accounting conservatism is crucial in obtaining diverse outcomes, particularly in the context of accrual-based earnings management (AEM) and real earnings management (REM). In sectors such as fuels and energy, as well as trade and services, opposite AEM patterns were observed depending on whether the companies implemented the principle of accounting conservatism. Additionally, the analysis of the asymmetry between total accruals and operating cash flows revealed significant differences in the behaviors of companies, especially in the healthcare and consumer goods sectors. The research also highlights the importance of selecting appropriate indicators to assess accounting conservatism, given the variability of earnings manipulation strategies across different industries.

The above-mentioned findings about sectoral heterogeneity of earnings quality are consistent with previous studies by Roychowdhury (2006), who found that earnings management behaviors depend on sector-specific conditions. Ball et al. (2013) emphasized that capital intensity and the prevalence of long-term contracts shape the magnitude of earnings management. This helps explain why conservative firms in the fuels and energy sector tend to manage earnings upward. On the other hand, service-oriented and trade sectors, characterized by lower asset tangibility and greater revenue recognition, are less inclined to implement the prudence principle (Cohen et al., 2008). Finally, Gunny (2010) showed that firms with high R&D intensity and growth opportunities reduce the effectiveness of conservatism as a constraint on accrual-based earnings management. These characteristics can be associated with, among other things, the health protection and technology sectors.

## 5. CONCLUSIONS

The identification of factors that differentiate the intensity of earnings manipulation across public companies remains a prominent theme in earnings management research. Existing literature offers divergent findings regarding whether accounting conservatism mitigates information asymmetry among a company's stakeholders and genuinely enhances the quality of reported earnings. This issue holds particular significance for countries

adhering to the continental accounting model and smaller markets, which tend to encounter greater challenges in detecting earnings manipulation practices.

The results of the present study provide empirical support for the first hypothesis (H.1), demonstrating that the magnitude of earnings manipulation in public companies applying accounting conservatism differs from that in non-conservative firms. However, statistical differentiation of earnings manipulation across the tested subpopulations was observed exclusively in cross-sectional estimates concerning specific years and industry sectors. Moreover, the method employed for evaluating accounting conservatism proved crucial, particularly in the context of accrual-based earnings management (AEM). In contrast, the second hypothesis (H.2), positing that the predominant dimension of earnings manipulation in firms applying accounting conservatism is downward earnings management, was not corroborated. In companies adhering to the prudence principle, downward earnings management was evident only in accrual-based manipulations. Meanwhile, proxies for real earnings management (REM), which pertains to harder-to-detect earnings manipulation through operational activities, were found to be positive in these firms.

In addition to its theoretical contributions, this study offers several practical implications. For audit committees, the results indicate the need to monitor not only accrual-based earnings management but also real activities manipulation in firms applying accounting conservatism. For regulators, the findings suggest that conservative accounting does not eliminate earnings management but may shift it toward less visible real activities. For investors and other users of financial statements, the results highlight the importance of jointly assessing different measures of earnings quality.

Nonetheless, the study is subject to certain limitations. The sample is confined to firms listed on the WSE and includes only publicly traded companies with a minimum of ten consecutive years of trading activity. Furthermore, alternative approaches to measuring accounting conservatism, such as those based on the relationship between book and market values, were not considered. Moreover, the analysis relies primarily on between-group comparisons of conservative and non-conservative firms. We do not apply panel regression models due to limited within-firm variation in the conservatism measures and earnings management proxies. Future research could address this limitation by using panel data to examine managerial behavior when firms adopt or abandon the prudence principle, as well as capture the internal effects of accounting conservatism over time.

The author has read and agreed to the published version of the manuscript.

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Małgorzata FIAŁKOWSKA-FILIPEK<sup>1</sup>Tomasz WYSOCKI<sup>2</sup>

## HUMAN-CENTRIC INNOVATION IN HEALTHCARE: THE ROLE OF INDUSTRY 5.0 TECHNOLOGIES IN ENHANCING PERSONALIZED PATIENT CARE

The integration of Industry 5.0 technologies, emphasizing human-centric innovation, is transforming healthcare into a more personalized and efficient system. This study explores the application of technologies such as artificial intelligence (AI), robotics, and the Internet of Things (IoT) within leading medical technology organizations. Through a narrative literature review and semi-structured interviews, the research highlights how these innovations enhance diagnostic accuracy, treatment precision, and operational efficiency, while addressing barriers like regulatory challenges, high costs, and stakeholder resistance. The findings underscore the need for strategic planning, infrastructure investment, and interdisciplinary collaboration to overcome these obstacles. By aligning technological advancements with human needs and ethical considerations, Industry 5.0 technologies have the potential to redefine healthcare, fostering personalized and high-quality patient care.

**Keywords:** personalized healthcare, artificial intelligence, medical technology, patient-centric care.

### 1. INTRODUCTION

The emergence of Industry 5.0 represents a significant evolution in industrial innovation, characterized by the integration of advanced technologies with human-centric principles (Breque et al., 2021). While Industry 4.0 primarily prioritized efficiency and automation, Industry 5.0 shifts the focus to creating systems that are adaptable, ethical, and sustainable (Fiałkowska-Filipek, Dobrowolska, 2023). By placing humans at the center of industrial processes, it emphasizes collaboration between individuals and intelligent systems, leveraging human creativity, innovation, and problem-solving skills to enhance outcomes (Scuotto et al., 2023). This approach prioritizes technological advancements that

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<sup>1</sup> Małgorzata Fiałkowska-Filipek, Wrocław University of Science and Technology, Poland; e-mail: malgorzata.fialkowska-filipek@pwr.edu.pl (corresponding author). ORCID: 0000-0003-1694-0032.

<sup>2</sup> Tomasz Wysocki, Wrocław University of Science and Technology, Poland; e-mail: tomasz.wysocki98@gmail.com. ORCID: 0009-0002-1186-5328.

improve human welfare and working conditions, fostering inclusivity and responsiveness to societal needs. Key technologies such as artificial intelligence (AI), robotics, the Internet of Things (IoT), and big data enable this paradigm, augmenting human capabilities while promoting sustainability and adaptability (Ivanov et al., 2022). Fundamentally, Industry 5.0 aligns technological progress with ethical considerations, resilience, and environmental responsibility, establishing a harmonious integration of innovation and human-centric values (Huang et al., 2022; Alves et al., 2023).

The focus on human-centricity is particularly significant in the healthcare sector, where personalized care has become an increasingly prominent model (Leplege et al., 2007). Traditional approaches to healthcare, which often relied on standardized treatments, are giving way to personalized strategies that consider individual patient needs, genetic profiles, and lifestyle factors. This shift reflects a broader commitment to improving patient outcomes through tailored care (El-Alti et al., 2019). Personalized care aligns seamlessly with the principles of Industry 5.0, as both emphasize the integration of human insight and technological innovation to achieve optimal results.

Technological advancements in healthcare are at the forefront of this transformation, driving the emergence of concepts such as Healthcare 5.0. This next evolution in healthcare harnesses the power of Industry 5.0 technologies to create intelligent, connected systems that support real-time monitoring, predictive analytics, and precision interventions. Innovations such as AI-driven diagnostic tools, IoT-enabled wearables, and robotic surgical systems are not only enhancing operational efficiency but also enabling more personalized, patient-centered care. These advancements promise to redefine the healthcare landscape, bridging the gap between technological potential and human-centric healthcare delivery (Mbunge, 2021).

The aim of this paper is to explore the role of Industry 5.0 technologies in enhancing personalized patient care within the healthcare sector. Through a narrative literature review and empirical insights from semi-structured interviews with senior employees of leading medical technology organizations, this study seeks to identify the practical applications, opportunities, and challenges of these innovations.

## **2. LITERATURE REVIEW**

### **2.1. Industry 5.0 – redefining innovation with human-centric technologies**

The essence of Industry 5.0 lies in fostering synergy between human creativity and technological capabilities. Technologies under this paradigm are designed not to replace but to complement human input, enabling collaboration between workers and intelligent systems (Breque et al., 2021). This shift underscores the need for innovations that balance industrial productivity with environmental responsibility, ethical considerations, and societal impact (Ghobakhloo et al., 2022).

Building upon foundational technologies of Industry 4.0, such as cyber-physical systems, IoT, and big data analytics, Industry 5.0 introduces an expanded focus on collaborative robotics (cobots), AI, and emerging innovations like 5G connectivity and blockchain. These technologies facilitate more personalized, efficient, and sustainable solutions across various sectors, including healthcare, manufacturing, and logistics. For instance, AI drives predictive analytics for quality control and personalized decision-making, while IoT enables real-time monitoring and asset tracking for smarter operations. Collaborative robots enhance precision in complex tasks, such as advanced surgical

systems, embodying the human-centric principles of Industry 5.0 (Adel, 2022; Maddikunta et al., 2022).

In healthcare, the integration of Industry 5.0 technologies marks a transformative shift toward smart healthcare, utilizing digital innovations to address diverse health needs. Technologies such as IoMT (Internet of Medical Things), cloud computing, and ambient assisted living foster seamless collaboration among patients, healthcare providers, and regulators, creating a cohesive system that prioritizes personalized and connected care (Mbunge, 2020; Muhammad et al., 2021). Emerging tools like blockchain and 5G enhance data security and connectivity, respectively, facilitating efficient healthcare delivery (Verma et al., 2023). Table 1 summarizes the core technologies that form the foundation of Industry 5.0 and their respective functions in healthcare.

Table 1. Industry 5.0 core technologies and their respective functions in healthcare

Technology	Description
Nanotechnology	Utilized in gene therapy, targeted drug delivery, disease diagnostics, and smart nano-implants. Includes nanosensors and IoNT for early disease detection and personalized health monitoring.
Internet of Things (IoT)	Facilitates real-time monitoring and data sharing through connected devices such as wearables, IoMT, and IoNT. Supports remote monitoring, early diagnosis, personalized care, and ubiquitous healthcare delivery.
Artificial Intelligence (AI)	Enables predictive analytics, disease prediction, smart drug development, and autonomous robotic surgery. Integrates sensor-based systems for real-time monitoring and diagnosis, including emotion AI for mental health and behavior analysis.
5G Technology	Provides high data transfer rates and low latency to enable seamless digital automation of smart devices, facilitating remote monitoring, diagnosis, and treatment.
Robotics	Includes autonomous, collaborative, and social robots used for surgical operations, disease diagnosis, medical supply delivery, and virtual rehabilitation. Addresses repetitive tasks and provides precision in surgeries.
Drone Technology	Used for medical supply delivery, public health surveillance, disinfection, and patient care support, especially during emergencies like pandemics.
Big Data Analytics	Processes health data from interconnected devices for disease prevention, diagnosis, and monitoring. Analyzes vast datasets for personalized care, resource optimization, and predictive modeling in healthcare.
Cloud Computing	Offers scalable, flexible data storage and analysis for managing patient health records and enabling remote healthcare services through synchronized smart devices and applications.
Blockchain	Ensures secure and immutable health information exchange, improves data privacy, and supports electronic medical records, insurance claims, and supply chain management in healthcare systems.

Source: own research, based on (Mbunge et al., 2021).

These technologies collectively aim to enhance human-technology collaboration, fostering innovation and resilience across industries. By leveraging these advancements, sectors such as healthcare can transition from rigid, one-size-fits-all approaches to systems

that prioritize human-centered innovation and personalized care, ensuring that technological progress aligns with individual needs and societal well-being.

## **2.2. Personalized patient care – a digital revolution in healthcare**

The transition from a one-size-fits-all approach to personalized care represents a transformative shift in healthcare, driven by advancements in digital technologies and a deeper understanding of individual patient needs (Haleem, Javaid, 2019; Awad et al., 2021). Personalized care emphasizes tailoring medical treatments and services to the unique characteristics of each patient, considering their genetic profile, lifestyle, preferences, and medical history (Leplege et al., 2007).

Personalized patient care is grounded in the integration of real-time monitoring, data analytics, and innovative medical technologies. It empowers patients to have greater control over how their care is planned and delivered, fostering collaboration between patients, providers, and healthcare systems. Advances in wearable devices, IoMT, and big data analytics enable continuous health monitoring and customized therapeutic interventions. This approach enhances patient satisfaction and improves outcomes by ensuring that treatments are optimized for individual needs (Mbunge et al., 2021). The COVID-19 pandemic underscored the critical importance of personalized care. Digital tools enabled remote consultations, real-time monitoring, and efficient resource allocation during global healthcare crises (Mbunge et al., 2020). For example, wearable devices provided vital health data to clinicians, enabling timely interventions, while IoMT technologies ensured the efficient delivery of medical supplies to remote locations (Haleem, Javaid, 2019).

The success of personalized care depends on the deployment of advanced technologies that enable precise, patient-centric solutions (Aceto et al., 2018). AI-powered systems analyze vast datasets to identify patterns, predict disease progression, and recommend individualized treatments. Machine learning algorithms also optimize drug dosage and reduce the risk of adverse reactions (Thomason, 2021). Collaborative robots, or cobots, assist in precision surgeries, rehabilitation, and targeted drug delivery, enhancing both the accuracy and efficiency of care (Haleem, Javaid, 2019). IoMT devices connect patients and providers through a network of sensors, enabling continuous health monitoring and real-time data sharing. This connectivity fosters early detection of health issues and supports proactive care management (Mbunge et al., 2021). High-speed, low-latency networks enhance the capabilities of IoMT devices, enabling faster data transmission, improved telemedicine services, and real-time remote monitoring (Bruendl, Fang, 2020).

Personalized care has profound implications for healthcare systems, offering improvements in patient outcomes, efficiency, and cost-effectiveness. Real-time monitoring and tailored interventions improve the precision of treatments, reduce the likelihood of complications, and enable early detection of diseases. AI and machine learning algorithms analyze extensive datasets to assist clinicians in making accurate, data-driven decisions (Gomathi et al., 2023). Automation of repetitive tasks, streamlined workflows, and integration of electronic health records free healthcare professionals to focus on complex, value-added activities. Speech recognition and natural language processing technologies reduce the burden of administrative tasks, improving overall efficiency (Haleem, Javaid, 2019). Technologies such as IoT, 3D printing, and cloud computing reduce costs by minimizing waste, optimizing resource use, and enabling remote care delivery. Additive manufacturing shortens development cycles for medical devices, further lowering costs (Choonara et al., 2016; Ong et al., 2021).

Despite its potential, personalized care faces significant challenges, including ethical dilemmas, data privacy concerns, and the digital divide. Addressing barriers such as affordability, technological literacy, and infrastructure disparities is essential to ensure equitable access to personalized healthcare (Awad et al., 2021). Its future depends on the continuous advancement of technologies and the integration of multidisciplinary approaches through collaboration among healthcare providers, technology developers, and policymakers.

### 3. METHODOLOGY

This research employed a qualitative methodology to explore the impact of Industry 5.0 technologies on personalized patient care. Qualitative methods are particularly suitable for investigating dynamic and complex phenomena, as they enable an in-depth understanding of subjective experiences and emergent themes (Glinka, Czakon, 2021). Semi-structured interviews were chosen as the primary data collection method due to their flexibility and ability to elicit detailed, context-rich information. These interviews allowed participants to express their perspectives on the integration of Industry 5.0 technologies in personalized care, offering valuable insights into both opportunities and challenges. The interview questions were designed to explore the implementation, impact, and future prospects of these technologies, as well as barriers to their adoption.

Participants consisted of senior employees from two medical technology organizations, selected to ensure a strategic and comprehensive understanding of the topic. Seven experienced professionals participated in virtual interviews conducted in June 2024. To foster clear communication, cameras were used during the sessions. Participation was entirely voluntary, and all interviewees provided informed consent after being briefed on the study's objectives and conditions, including their right to skip questions or withdraw from the session at any time.

The interview data were analyzed using NVivo 14, a qualitative data analysis software. The process began with importing the transcribed interviews into the software, followed by manual coding of relevant text segments. These segments were labeled with codes representing key themes and concepts aligned with the research scope. The codes were then categorized to identify recurring patterns and emergent themes. Thematic clustering was employed to group similar codes and extract deeper insights from the data. The categorized themes were subsequently refined to ensure their clarity and alignment with the research objectives. To enhance the rigor and credibility of the qualitative analysis, the study adhered to established validation practices, including member checks and reflective memoing during coding. Cross-verification was conducted to maintain consistency and reliability. The analysis identified four key themes, which are detailed in the following section and visually represented in Figure 1.

### 4. RESULTS

#### **Innovation drivers: the impact of AI and robotics**

The first theme highlights the transformative role of AI and robotics in driving healthcare innovation. Participants emphasized the critical importance of AI in data gathering and analysis, particularly for improving patient outcomes. AI algorithms enable organizations to process vast datasets encompassing treatments, patient histories, clinical staff performance, and outcomes. This capability allows for the identification of patterns

and insights, leading to more accurate diagnoses and personalized treatment plans. Consequently, AI is seen as a cornerstone in improving the quality of care and enhancing patient outcomes. Moreover, the use of AI in streamlining research and development processes was highlighted as a critical enabler of faster product delivery. By leveraging systematic literature reviews and optimizing clinical trials, AI significantly reduces the time required to bring medical innovations to market.

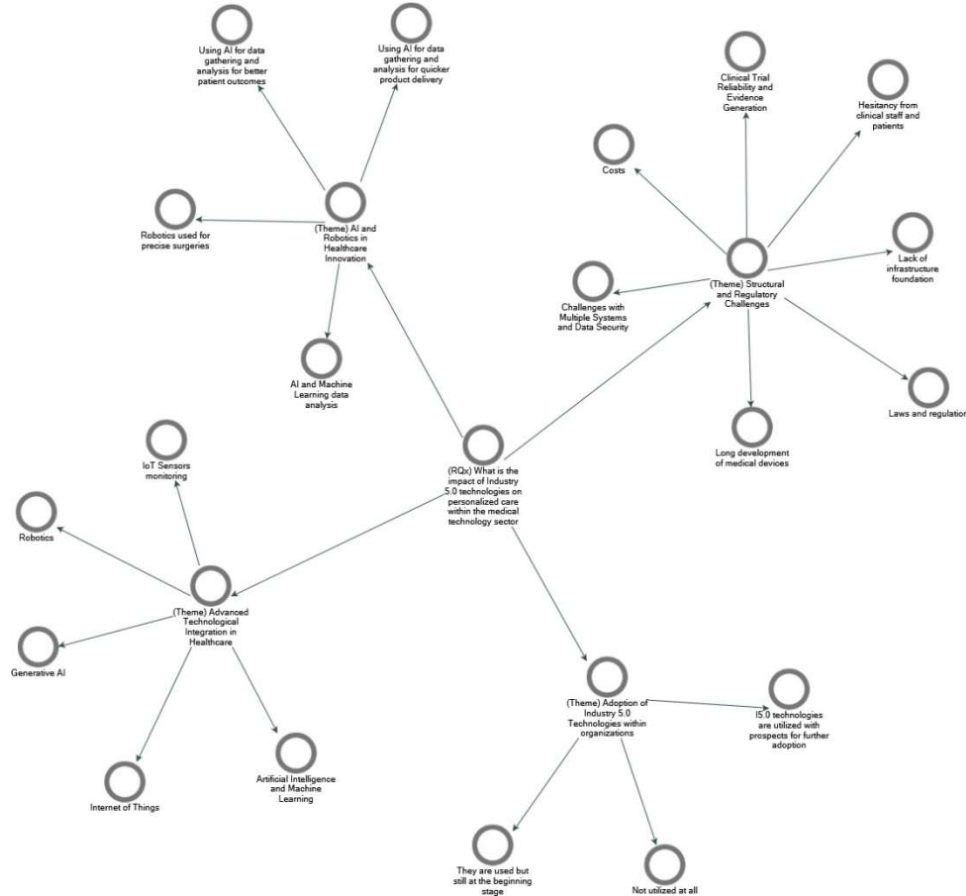


Figure 1. Project map illustrating the connections between the research question, themes, and labels

Source: own elaboration.

Robotics was another technology discussed within this theme. Robotic systems enhance precision and control in surgeries, reducing invasiveness and contributing to shorter recovery times. These systems enable surgeons to perform delicate procedures with unmatched accuracy, thereby improving surgical outcomes and ensuring greater patient safety. Respondents noted the significant potential of robotics to revolutionize surgical practices, with one participant describing ongoing efforts to expand its applications across different types of surgeries, such as knee, hip, and shoulder replacements.

The analysis also revealed a recurring emphasis on terms such as “automation,” “accuracy,” and “opportunity,” underscoring the optimism surrounding these technologies. Word tree visualizations highlighted the contextual usage of these terms, revealing how participants framed AI and robotics as tools to enhance operational efficiency, streamline processes, and drive innovation in healthcare.

### **Organizational readiness and adoption**

The second theme explores the varying levels of adoption of Industry 5.0 technologies within organizations. Adoption was categorized into three clusters: initial trials, active utilization, and non-adoption. Some departments have initiated small-scale trials and created centers of excellence to explore the potential of these technologies. However, these efforts are still at an early stage, and the full potential of Industry 5.0 innovations remains unrealized. Participants frequently referred to their organizations as being in the “infancy” of adoption, indicating that while interest in these technologies is high, significant investments and structural changes are required for broader implementation.

Other departments have progressed beyond initial trials and actively utilize Industry 5.0 technologies, recognizing their potential to deliver measurable benefits. These divisions are planning for expanded implementation, driven by the positive outcomes observed in early applications. However, some areas within organizations remain untouched by these technologies due to barriers such as insufficient infrastructure, regulatory constraints, and hesitancy among clinical staff.

Word tree analysis further highlighted terms like “adoption,” “implement,” and “integrate,” reflecting a collective understanding of the need for strategic investments and alignment. Despite challenges, there was optimism about the future, with participants identifying opportunities to expand adoption through targeted resource allocation, training programs, and infrastructure upgrades.

### **Critical barriers: regulatory and financial constraints**

The third theme explores the structural and regulatory challenges that impede the adoption of Industry 5.0 technologies. Stringent regulatory requirements in the medical field emerged as a significant barrier, as organizations must navigate complex compliance processes involving extensive documentation, testing, and approvals. These delays often hinder the timely implementation of new technologies, limiting their immediate impact on patient care.

Financial constraints were another prominent challenge. The high costs associated with acquiring and maintaining advanced technologies discourage investment, particularly in resource-constrained environments. Additionally, the lack of foundational infrastructure, such as modernized data systems, was frequently mentioned as a critical impediment. One participant described their department as “incredibly paper-based,” highlighting the need for digital transformation to support seamless integration.

Hesitancy among clinical staff and patients also emerged as a barrier to adoption. Concerns about the reliability and safety of new technologies, coupled with resistance to change, slow the integration process. Participants called for robust education and training programs to build trust and address misconceptions, emphasizing the need for clear communication about the benefits and functionalities of these innovations.

### Practical applications and real-world use cases

The fourth theme focuses on the current implementation of Industry 5.0 technologies in healthcare. Despite the challenges, certain technologies have already been integrated into healthcare practices, showcasing their potential to enhance efficiency, improve patient outcomes, and streamline operations. AI and machine learning are being utilized for predictive modeling, data analysis, and personalized treatment planning. For example, software solutions have been deployed to improve surgical planning and optimize patient care pathways.

Robotics has become a cornerstone in surgical innovation, with systems enabling minimally invasive procedures that reduce recovery times and enhance patient safety. Participants described the growing adoption of robotic systems in orthopedics, with plans to expand their applications to other areas such as sports medicine.

IoT devices and sensors also play a crucial role in real-time patient monitoring and data exchange. These technologies enable continuous health tracking and rapid responses to medical needs. Examples include glucose meters for blood sugar monitoring and systems designed to prevent pressure injuries by tracking patient movement.

The analysis revealed a strong enthusiasm for these technologies, despite their varying levels of adoption. Participants recognized the tangible benefits of Industry 5.0 innovations, expressing optimism about their potential to transform healthcare practices. However, they also stressed the need for ongoing research, strategic planning, and efforts to address regulatory and structural challenges to fully leverage these advancements.

## 5. CONCLUSIONS

This study underscores the potential of Industry 5.0 technologies, such as AI, robotics, and IoT, in advancing personalized patient care. By examining their implementation within leading medical technology organizations, the research highlights how these innovations enhance diagnostic accuracy, treatment precision, and operational efficiency. Technologies like wearable sensors, robotic surgical systems, and AI-powered decision-making tools are already improving patient-centered care, emphasizing the shift toward human-centric innovation in healthcare. Despite their promise, challenges such as regulatory barriers, significant costs, and resistance from stakeholders hinder widespread adoption. Addressing these barriers requires strategic planning, infrastructure investment, and interdisciplinary collaboration. While the integration of Industry 5.0 technologies is still in its early stages, their role in shaping the future of healthcare is undeniable. By embracing these innovations and addressing existing limitations, the healthcare sector can achieve its goal of providing truly human-centric, high-quality care.

All authors have read and agreed to the published version of the manuscript.

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Natia KHUKHUNAISHVILI<sup>1</sup>Tshotne ZHGHEENTI<sup>2</sup>

## MAPPING THE SKILL ARCHITECTURE OF GENERATIVE AI OCCUPATIONS: EVIDENCE FROM GLOBAL JOB POSTINGS

Generative artificial intelligence is creating new occupational fields in which working with these systems is the core task rather than an occasional tool, yet most labour-market discussion remains theoretical and disconnected from concrete skill requirements. This study addresses this gap by examining how employers structure skill demands and roles in GenAI-intensive occupations in mature labour markets. Using 703 job postings from North America, the European Economic Area and the United Kingdom, postings were coded by business use case, technical and governance-related skills, and occupation based on the International Standard Classification of Occupations and analysed through skill co-occurrence patterns. The results reveal a clear competency hierarchy, with cloud infrastructure, model deployment and security and compliance forming a shared backbone across use cases, while frontend and prompt-interaction skills remain niche. Employers typically demand recurring skill bundles rather than isolated skills, anchoring technical core roles, while business-facing roles concentrate on governance and decision-support applications. Overall, these labour markets are consolidating around common infrastructural bundles while simultaneously producing specialised organisational niches, offering practical insights for curriculum design, workforce development and organisational planning.

**Keywords:** generative artificial intelligence, occupational specialization, skill bundling, labor market transformation, workforce adaptation.

### 1. INTRODUCTION

Generative artificial intelligence (GenAI) is rapidly reshaping modern labor markets, creating job categories that did not exist only a few years ago. These are not simply jobs where AI tools are occasionally used, but dedicated GenAI roles in which building,

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<sup>1</sup> Natia Khukhunaishvili, Business and Technology University, Georgia; e-mail: natia.khukhunaishvili@btu.edu.ge. ORCID: 0009-0001-7256-9445.

<sup>2</sup> Tshotne Zhghenti, Business and Technology University, Georgia; e-mail: tshotne.zhghenti@btu.edu.ge (corresponding author). ORCID: 0000-0002-6779-172X.

deploying, and governing generative systems form the central professional activity. Employers now advertise positions such as Prompt Engineer, Generative AI Architect, and AI Policy and Compliance Manager, etc.

Global institutions have already recognized this transformation. The OECD (2024) reports that nearly one third of firms now use generative AI, with rising demand for skilled professionals who can integrate these technologies into core business processes. The World Economic Forum (2025) likewise notes that GenAI is reshaping job structures across more than fifty economies, giving rise to new positions such as AI developers, AI content creators, and specialists in AI ethics.

The emergence of such roles provides clear motivation for new academic research. Much of the existing discussion still focuses on theoretical debates about automation, skill substitution, or digital transformation, but empirical evidence on how GenAI jobs are actually structured remains scarce. The pace of technological diffusion is so rapid that traditional labor statistics cannot capture these changes. In contrast, job postings reveal how employers currently describe and combine skills, offering a direct and timely reflection of real labor market expectations. Because these occupations are so new and still evolving, fresh empirical analysis is essential to understand how they are being defined in practice and how new patterns of skill formation are taking shape.

This article addresses two guiding questions:

- (1) How do skill co-occurrence patterns across use cases shape the structure of roles in the AI labor market?
- (2) To what extent does the differentiation between broadly transferable and context-specific skills shape occupational specialization and the division of labor in emerging AI-related work?

By situating the analysis at the intersection of theory and practice, the study contributes to a more grounded understanding of GenAI skill architectures. It identifies foundational infrastructure skills, transversal technical skills, and emergent niche skills, offering a framework that links academic perspectives on technological change with the empirical realities of labor market demand.

## 2. LITERATURE REVIEW

GenAI is changing the job market by altering the skills workers need and the contexts in which those skills are used. Emerging roles draw on new technical competencies and span a wide range of business applications, from product management and process optimization to customer engagement and education. This section examines two interconnected dimensions: the skills emerging in GenAI-related occupations and their corresponding use cases to provide a structured overview of how the academic literature explains the evolving architecture of work.

The recent academic literature identifies a coherent set of technical and cognitive skills underpinning emerging GenAI occupations. These competencies reflect the convergence of programming, data engineering, and ethical awareness required to integrate generative systems into productive workflows.

Prompt engineering has become an interesting capability for professionals working with large language models. Adaptive prompt formulation can account for substantial improvements in task performance (Jahani et al., 2025), while frameworks for responsible design embed ethical and legal considerations into model interaction (Djeffal, 2025). Applied research highlights that structured prompting enhances precision and efficiency in

generative workflows (Samsami, 2024). Labor-market analyses further show that employers increasingly prioritize AI-related and prompt-engineering skills over formal qualifications (Bone et al., 2025).

In backend development, empirical studies demonstrate that AI-based automation and integration improve operational efficiency within software systems (Khokhlov, 2025). Evidence from job-market data confirms a rapid increase in demand for developers capable of embedding generative AI in production environments (Ahmadi et al., 2024). Systematic reviews describe backend automation, data orchestration, and model integration as core infrastructural competencies (Salari et al., 2025). On the other hand, Frontend development now extends to the design of human–AI interfaces that promote adaptability and intuitive collaboration. Generative systems in architecture and engineering contexts enhance creative exploration and design communication (Wan et al., 2024; Sahraoui et al., 2025). Similarly, reviews of industry practices emphasize the growing requirement for interface designers skilled in visualization and multimodal interaction (Onatayo et al., 2024).

Table 1. Required Skills for Jobs Related to Generative AI in Academic Literature

GenAI-related Skills	Description	Supporting Literature
Prompt Engineering	Crafting effective and precise prompts for Generative AI tools, particularly for large language models (LLMs).	Jahani et al., 2025; Djeflal, 2025; Samsami, 2024; Bone et al., 2025.
Backend Development	Building and maintaining application logic and data pipelines that support GenAI systems, often through Python or JavaScript frameworks such as FastAPI or Express.	Khokhlov, 2025; Ahmadi et al., 2024; Salari et al., 2025.
Frontend Development	Creating interactive user interfaces for AI-driven applications using frameworks like React or Vue.js, enabling intuitive access to generative outputs.	Wan et al., 2024; Sahraoui et al., 2025; Onatayo et al., 2024.
Cloud Infrastructure	Deploying and managing GenAI applications in scalable cloud environments such as AWS, Azure or GCP, including optimization and resource allocation.	Patel et al., 2024; Idnay et al., 2025; Kavargyris et al., 2025.
AI Model Deployment	Implementing and fine-tuning AI models in production environments, focusing on efficiency and scalability.	Reznikov, 2024; Prabu, 2025; Salari et al., 2025.
Security and Compliance	Applying data protection, ethical AI, and regulatory standards (e.g., GDPR) to safeguard generative systems from bias, privacy risks and misuse.	Alt et al., 2024; Lorenz et al., 2023; Nigar, 2025.

Source: prepared by the author based on literature review.

Expertise in cloud infrastructure is essential for the deployment and scalability of GenAI applications. Studies highlight the need for high-performance computing,

distributed learning, and storage optimization (Patel et al., 2024; Idnay et al., 2025). Broader labor-market analyses classify cloud and data-infrastructure management as critical “future skills” within the GenAI workforce (Kavargyris et al., 2025). AI model deployment competencies focus on fine-tuning, validation, and integration of generative models into enterprise systems. Strategic adoption frameworks demonstrate how organizations align deployment processes with governance and performance objectives (Reznikov, 2024; Prabu, 2025). Systematic reviews confirm that model integration and continuous learning are essential for sustaining generative AI performance across industries (Salari et al., 2025).

Additionally, security and compliance have become central pillars in GenAI practice. Technical analyses identify new risks related to model transparency and data governance (Alt et al., 2024), while policy reviews stress the importance of regulatory frameworks for mitigating bias and disinformation (Lorenz et al., 2023). Broader societal research underscores the emergence of ethical and compliance-oriented skills as automation reshapes employment structures (Nigar, 2025).

Skills alone do not determine how generative artificial intelligence is applied in organizations. The same technical competencies can support very different forms of value creation depending on the business context in which they are embedded. Generative AI integration is strongly shaped by its primary business use cases, for example in enterprise product management. Generative AI integration in enterprise product management is largely driven by its value in ideation, customization, and rapid prototyping. GenAI accelerates product development cycles and improves customer alignment. Witkowski and Wodecki (2025) show that GenAI enhances end-to-end product workflows, while Adhikari et al. (2025) report gains in design flexibility and personalization. In creative industries, Channi et al. (2025) and Chang & Tung (2025) highlight how generative tools improve both design quality and speed by combining data-driven insights with human creativity.

In process optimization, Generative AI enhances enterprise efficiency by automating tasks and streamlining workflows. In IT and business operations, it improves data processing, testing, and workflow design, leading to measurable gains in productivity and cost savings (Alla, 2025; Elbasheer et al., 2025; Salari et al., 2025).

Generative AI plays a growing role in decision augmentation by enhancing forecasting, scenario planning, and strategic reasoning. Studies show that foundation models support more adaptive and data-rich managerial decisions (Badhon et al., 2025; Wang et al., 2025). These systems also complement human judgment in complex environments through simulation and cognitive modeling (Kavargyris et al., 2025). Experimental evidence further confirms that GenAI tools improve task performance in decision-support contexts, including competitive analysis and strategic tasks requiring complex judgment (Przegalinska et al., 2025).

Generative AI is reshaping customer engagement by enhancing personalization and automating support interactions. Studies show productivity gains in service delivery and more dynamic conversational interfaces (Majumdar, 2025; Taylor, 2025). Strategic adoption models further support GenAI’s role in increasing satisfaction and tailored communication (Reznikov, 2024; Bone et al., 2025). Research on human-AI collaboration in organisational settings shows that AI assistants also enhance creative and routine task performance, with the quality of outputs consistently higher when humans work alongside GenAI tools (Przegalinska et al., 2025).

The use of GenAI in research and data insights allows rapid synthesis and interpretation of complex information. Recent research highlights how generative AI systems improve

data governance, streamline reporting, and catalyze scientific creativity through automated hypothesis generation and summarization (Hartung, 2025; Gopal et al., 2025). These technologies function as cognitive collaborators that extend researchers' analytical reach while preserving interpretive oversight (Sætra, 2025; Noy, Zhang, 2023).

Finally, education and training applications of GenAI demonstrate its potential to personalize learning pathways and upskill workers. Case studies highlight improved student engagement, critical thinking, and adaptability when AI tools are integrated into instruction (Kavargyris et al., 2025). Reviews in engineering and architectural education further show that GenAI supports design reasoning and reflective learning (Onatayo et al., 2024). Broader analyses of AI-driven competency transformation indicate that demand is shifting toward analytical thinking, creativity, and adaptability, while routine skills decline placing sustained investment in upskilling at the centre of workforce strategy (Dewalska-Opitek et al., 2025; Kawa, 2025).

Table 2. Primary Use Cases of AI in Jobs Related to Generative AI in Academic Literature

Primary Use Case	Description	Supporting Literature
Enterprise Product Management	AI-driven automation in product development, lifecycle management and strategic decision-making for enterprises.	Witkowski and Wodecki, 2025; Adhikari et al., 2025; Channi et al., 2025; Chang, Tung, 2025.
Process Optimization	AI-enhanced automation of workflow efficiency, supply chain management and business operations.	Elbasheer et al., 2025; Alla, 2025; Salari et al., 2025.
Decision Augmentation	AI models supporting business strategy, risk assessment and data-driven decision-making.	Wang et. al., 2025; Kavargyris et al., 2025; Przegalinska et al., 2025.
Customer Engagement	AI-powered chatbots, virtual assistants, and personalized recommendation systems to improve customer experience.	Reznikov, 2024; Majumdar, 2025; Taylor. (2025); Bone et al., 2025; Przegalinska et al., 2025.
Research and Data Insights	AI-generated reports, predictive modeling and automated data analytics.	Noy and Zhang, 2023; Hartung, 2025; Gopal et al., 2025; Sætra, 2025.
Education and Training	AI-driven adaptive learning, tutoring systems and content generation for education.	Kavargyris et al., 2025; Onatayo et al., 2024; Dewalska-Opitek et al., 2025; Kawa, 2025.

Source: prepared by the author based on literature review.

Together, this literature supports a reframing of GenAI labor markets not as collections of discrete skills, but as ecosystems of interdependent competencies, with bundling shaping both occupational identity and pathways for workforce adaptation.

### 3. METHODOLOGY

This study focuses on dedicated Generative AI jobs roles where GenAI constitutes the central task and occupational identity, rather than positions where AI tools are only occasionally applied. Job postings were collected from LinkedIn on 15 June 2025 using the keywords "GenAI" and "Generative AI." The final and cleaned dataset comprises 703

postings, distributed across three major developed labor markets: North America (408), European Economic Area (253), and United Kingdom (39). These regions were selected due to their relatively mature GenAI ecosystems and the consistency of English-language job descriptions, which facilitate systematic comparison.

To ensure data integrity, postings were first screened to remove duplicates, as the same vacancy is often reposted multiple times by employers. This filtering step prevented inflation of particular skills or use cases.

After cleaning, the postings were coded against two sets of analytical categories. First, each posting was assigned to one of six primary GenAI use cases: enterprise product management, research and data insights, decision augmentation, customer engagement, education and training, and process optimization. These categories were drawn from prior academic and policy literature and applied deductively. Second, postings were coded for the presence or absence of six core technical skills: Cloud Infrastructure, AI Model Deployment, Security & Compliance, Backend Development, Frontend Development, and Prompt Engineering. Each posting was coded manually by the author. A posting was assigned to a use case if its job description explicitly referenced the corresponding business function or application context. A skill was recorded as present if it was explicitly listed in the required or preferred qualifications or prominently described in the role's responsibilities. Skills mentioned only incidentally or as desirable were excluded. Where a posting referenced multiple use cases or skills, all applicable categories were recorded, allowing for co-occurrence analysis across the full dataset.

In parallel, the analysis focused on a set of core skills recurrently emphasized in GenAI research, including Cloud Infrastructure, AI Model Deployment, Security & Compliance, Backend Development, Frontend Development, and Prompt Engineering. These skills were selected because the literature consistently highlights them as the building blocks of GenAI adoption, spanning both infrastructural capabilities and emergent human–AI interaction. By aligning employer demands with these categories, the analysis identifies co-occurrence patterns and examines how skills and use cases cluster within specific ISCO occupational groups.

Several limitations must be acknowledged:

- The dataset reflects only developed labor markets (North America, U.K., and EEA). Findings cannot be generalized to emerging economies where adoption dynamics may follow different trajectories.
- Reliance on LinkedIn as the sole source excludes vacancies posted on other platforms (e.g., Indeed, Glassdoor) or through informal channels such as company websites, recruitment agencies, or professional networks. This exclusion may underrepresent smaller firms, startups, or organizations outside LinkedIn's dominant recruitment ecosystem.
- Job postings express employers' expectations rather than the actual day-to-day competencies required. Some requirements may be aspirational, generic, or shaped by HR templates rather than technical necessity.

Despite these constraints, the dataset provides a robust and timely snapshot of how demand for GenAI-specific labor is articulated. It highlights how skills are clustered, how they align with use cases, and how occupational specialization is emerging in practice.

#### 4. RESULTS

Out of the 703 GenAI-specific vacancies, just over half were advertised as onsite roles (51%), while hybrid (27%) and remote (22%) formats accounted for the remainder.

In terms of geographic distribution, postings were most frequently located in the United States, Germany, Poland, United Kingdom, France, and Canada. Other countries with smaller but visible shares included Spain, Italy, Switzerland, Portugal, Romania, the Netherlands, and Austria. Several postings were tagged at the level of metropolitan areas rather than countries, such as the San Francisco Bay Area, New York City Metropolitan Area, Washington DC–Baltimore Area, Greater Munich, Greater Madrid, Greater Toulouse, Cologne–Bonn, Greater Turin, Greater Lille, and Frankfurt Rhine–Main.

With regard to occupational orientation, the majority of postings fell into engineering, data science, and systems architecture, complemented by specialist and analyst roles explicitly tied to GenAI applications.

The analysis of skill requirements across generative AI use cases reveals a clear hierarchy that can be understood in terms of both prevalence and transferability. At the foundation lie Cloud Infrastructure, AI Model Deployment, and Security & Compliance, each required in nearly half or more of postings across domains. These competencies function as foundational infrastructure skills, underscoring their role in enabling scalability, reliability, and governance. Cloud Infrastructure is particularly prominent, appearing in over 60 percent of use cases and consistently co-occurring with Deployment and Security, thereby confirming its status as the backbone of adoption.

Backend Development occupies an intermediate position, present in roughly 42–46 percent of postings. While it does not serve as a defining feature of GenAI roles on its own, it operates as a transversal technical skill: sufficiently versatile to appear across domains, yet most salient in Customer Engagement when paired with Frontend Development, where it supports the integration of user-facing systems.

By contrast, Prompt Engineering and Frontend Development emerge as emergent niche skills. Prompt Engineering, observed in only 20–25 percent of postings, peaks in Decision Augmentation, reflecting the growing centrality of human–AI interaction in this domain. Frontend Development, rarely exceeding 14 percent, is concentrated almost exclusively in Customer Engagement, where it complements backend expertise in delivering user-facing applications.

These patterns delineate three categories of generative AI competencies.

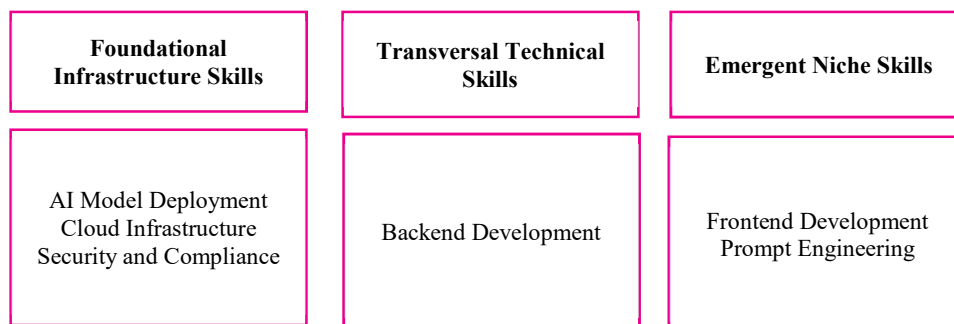


Figure 1. Categorization of Core Skills in Generative AI Jobs

Source: prepared by the authors.

The analysis demonstrates that a limited set of core skills repeatedly co-occur across multiple use cases, forming the dominant “skill bundles” in the GenAI labor market. Across all postings, Cloud Infrastructure, AI Model Deployment, and Security and Compliance emerge as the most frequently required competencies, often appearing together in pairs or as a full triad.

The most prominent bundle comprises AI Model Deployment, Cloud Infrastructure, and Security and Compliance, which together form the infrastructural backbone of GenAI adoption. While the full triad appears in around 15–18 percent of postings across different use cases, overlapping pairs are considerably more widespread. Deployment + Cloud ranges between 30–39 percent, Cloud + Security between 29–41 percent, and Deployment + Security between 27–35 percent depending on the use case. This consistency across domains highlights that employers rarely demand these skills in isolation; instead, they appear as interdependent capabilities that collectively ensure scalability, deployment, and governance. These bundles are particularly salient in Enterprise Product Management and Research & Data Insights, where employers consistently demand combinations of these skills. In Enterprise Product Management, they are most frequently observed in roles such as AI/ML Engineers, AI Architects, and Senior Python or Software Developers, whose work centers on building, scaling, and securing enterprise-level systems. In Research & Data Insights, the same patterns are visible among GenAI Data Scientists, Applied AI Engineers, and GenAI Research Interns, but also extend to Consultants in Data Science & GenAI, reflecting the integration of governance and interpretive tasks alongside technical deployment.

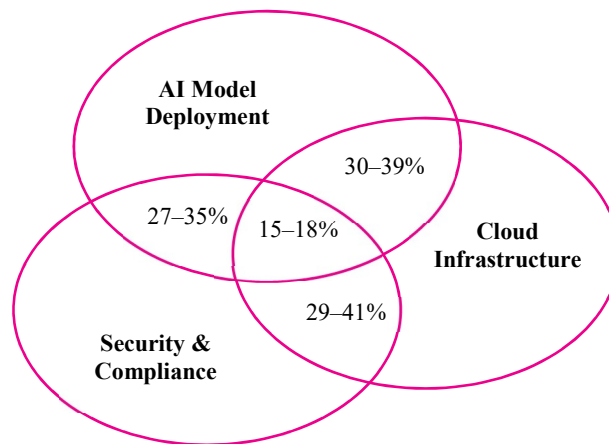


Figure 2. Core Skill Bundles in Generative AI Roles

Source: prepared by the authors.

The persistence of this triad indicates that employers treat these skills not as independent competencies but as interdependent capabilities: deploying models requires scalable infrastructure, and both necessitate compliance and governance frameworks. Skill bundles were identified by examining co-occurrence across individual job postings: a bundle was recorded when two or more skills appeared together within the same posting. Pearson correlation coefficients were then computed for each skill pair within each use case to quantify the strength of these co-occurrence patterns. The resulting correlations

(e.g.,  $r = 0.21$  between AI Deployment and Cloud in Enterprise Product Management, and  $r = 0.25$  between AI Deployment and Security in Research and Data Insights) confirm the joint demand for these competencies.

Other notable bundles include Backend Development + Cloud Infrastructure, which accounts for 26–33 percent of jobs across major use cases, and AI Model Deployment + Backend Development, with shares between 22–27 percent depending on the domain. These pairs are particularly characteristic of AI Solutions Architects, Computer Network Engineers, and AI Software Developers, highlighting the continuing importance of system-level integration skills, especially where GenAI intersects with legacy architectures.

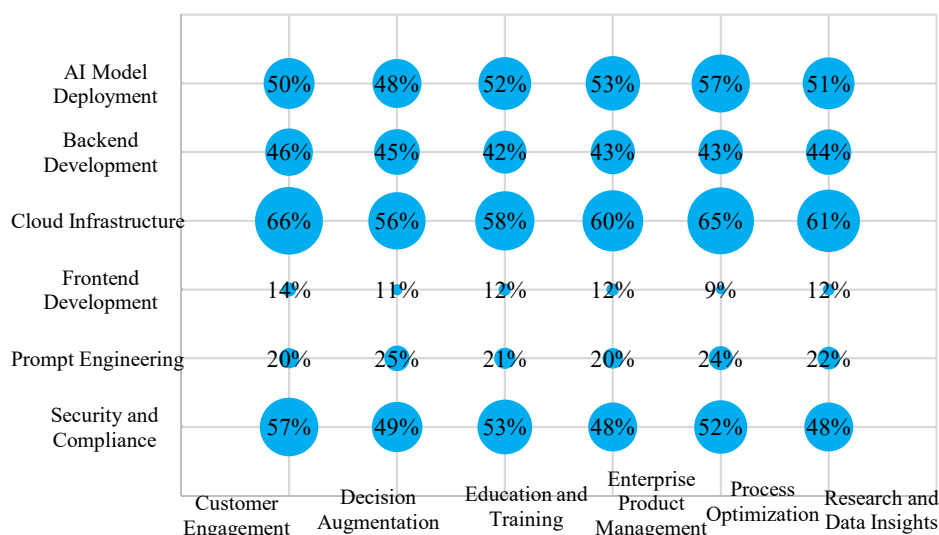


Figure 3. Share of Jobs Requiring Specific Skills Within Each GenAI Use Case

Source: prepared by the authors.

The integration of ISCO occupational categories with use cases and skills reveals how GenAI-related positions are structured across different professional groups. These findings do not describe the general labor market profiles of these occupations but rather their specialization within the GenAI segment.

Software Developers (ISCO 2512) and Database & Network Professionals (ISCO 2529) emerge as the most skill-intensive categories. In GenAI postings, they are strongly associated with Enterprise Product Management and Research & Data Insights. Their profiles are dominated by Cloud Infrastructure and AI Model Deployment, with additional reliance on Security & Compliance. This positions them as the core technical backbone of GenAI adoption, responsible for building, scaling, and securing enterprise-level systems. Management and Organization Analysts (ISCO 2421), by contrast, are concentrated in Decision Augmentation. Here, Prompt Engineering becomes more salient, complemented by Cloud and Security. It indicates a hybrid function in GenAI: bridging organizational decision-making processes with AI systems, while maintaining governance and reliability rather than focusing on model deployment. Database Designers & Administrators (ISCO 2521) are present in both Enterprise Product Management and Research & Data Insights,

but their skill profile is more stable. They emphasize Security & Compliance and Prompt Engineering over Deployment, pointing to a governance- and structure-oriented role. These positions prioritize data integrity, system compliance and the design of AI-ready databases rather than algorithmic implementation. Computer Network Professionals (ISCO 2523) represent the most infrastructure-dominant GenAI group. They exhibit the highest reliance on Cloud Infrastructure and Security & Compliance, with strong associations to Enterprise Product Management and Customer Engagement. Their role is to ensure the scalability and security of GenAI platforms, anchoring the infrastructural capacity needed for enterprise adoption.

Table 3. Mapping of ISCO Occupational Groups to Generative AI Use Cases and Dominant Skills

ISCO Group	Top Use Cases	Dominant Skills
2512 – Software Developers	Enterprise Product Management (79%), Research & Data Insights (82%)	Cloud Infrastructure (61%), AI Model Deployment (56%), Security & Compliance (52%)
2529 – Database & Network Professionals	Enterprise Product Management (84%), Research & Data Insights (92%)	Cloud Infrastructure (61%), AI Model Deployment (52%), Security & Compliance (38%)
2421 – Management & Organization Analysts	Decision Augmentation (56%)	Cloud Infrastructure (41%), Security & Compliance (39%), Prompt Engineering (14%)
2521 – Database Designers & Administrators	Enterprise Product Management (81%), Research & Data Insights (65%)	Security & Compliance (46%), Prompt Engineering (27%), AI Model Deployment (15%)
2523 – Computer Network Professionals	Enterprise Product Management (74%), Customer Engagement (39%)	Cloud Infrastructure (78%), Security & Compliance (65%)

Source: Developed by the authors.

These findings show that within GenAI-specific roles, technical ISCO groups (2512, 2529, 2523) concentrate around the backbone of Cloud, Deployment, and Security, serving as the infrastructural anchors of adoption. In contrast, business-facing groups (2421, 2521) diversify into Decision Augmentation and governance-oriented applications, frequently incorporating Prompt Engineering. It highlights how GenAI is not simply absorbed into existing occupations but reshapes them into specialized segments, consolidating technical roles around infrastructural bundles while creating hybrid organizational roles.

To better understand how generative AI roles are structured in the labor market, job postings can be grouped into three broad categories that capture their dominant functions: Technical Core Roles, which focus on building and scaling systems; Organizational and Analytical Roles, which emphasize decision-support and governance; and Cross-Functional Technical-Support Roles, which ensure infrastructure reliability and compliance. Each category is associated with a distinct mix of skills and characteristic bundles, as summarized in the table 4.

Table 4. Functional Categorization of Generative AI Roles and Associated Skill Bundles

Category	Example Job Titles	Key Skills	Major Skill Bundles
Technical Core Roles	AI/ML Engineer, Software Developer, AI Architect, Cloud Engineer, Network Specialist	Cloud Infrastructure, AI Model Deployment, Backend Development, Security & Compliance	Backend + Cloud); Deployment + Backend
Organizational & Analytical Roles (Non-Technical)	Business Analyst, GenAI Consultant, Project Manager, Strategy/Policy Manager	Security & Compliance, Cloud Infrastructure, Prompt Engineering	Prompt Engineering (solely or with others); Prompt + Cloud; Backend + Cloud
Cross-Functional Technical-Support Roles	Database Designer, Database Administrator, System Integrator, Computer Network Professional	Security & Compliance, Cloud Infrastructure, some AI Model Deployment	No strong recurring bundles detected (skills appear more individually than in fixed combinations)

Source: Developed by the authors.

## 5. CONCLUSIONS

This study mapped the structuring of skills, bundles, and roles in the emerging generative AI-related job market. The results demonstrate a clear hierarchy of competencies: Cloud Infrastructure, AI Model Deployment, and Security & Compliance form the universal backbone, present in nearly half of postings across use cases. Backend Development occupies an intermediate, moderately transferable skill, while Prompt Engineering and Frontend Development remain niche but increasingly salient in decision-support and customer-facing domains.

Beyond single skills, analysis of co-occurrence patterns shows that employers treat competencies as interdependent. The most consistent bundles: Cloud + Deployment, Cloud + Security and Deployment + Security appear in around one-third of postings in enterprise and research use cases. While the full triad rarely appears explicitly, its overlapping pairs signal a de facto infrastructural cluster. Complementary bundles such as Backend + Cloud and Deployment + Backend highlight the continuing importance of system-level integration.

At the occupational level, differentiation emerges clearly. Technical roles (developers, engineers, architects) anchor the backbone triad, specializing in scalable and secure deployment. Organizational and analytical roles (analysts, consultants, managers) emphasize governance and interpretive skills, where Prompt Engineering appears as a defining but under-specified competency. Cross-functional support roles (database designers, administrators, network professionals) focus heavily on Security & Compliance and Cloud, with fewer recurring bundles, underscoring their orientation toward reliability and infrastructure integrity.

Taken together, the findings indicate that the GenAI labor market is consolidating around universal infrastructural bundles in technical domains, while simultaneously creating specialized governance and interaction-oriented niches in non-technical roles. The

uneven representation of certain skills, such as Prompt Engineering, suggests that job postings understate emerging competencies that may nevertheless be central in practice.

These findings carry practical implications for several groups. For educators and curriculum designers, the dominance of the Cloud–Deployment–Security triad suggests that training programmes should prioritise these infrastructural competencies as a common foundation, while embedding Prompt Engineering and governance skills in non-technical pathways. For employers, the skill bundle patterns offer a basis for more coherent job design: rather than listing skills in isolation, role profiles can be structured around the interdependent clusters identified here. For policymakers, the uneven representation of governance-oriented skills across occupational groups points to gaps in current workforce development strategies, particularly for roles at the interface of technical systems and organisational decision-making.

All authors have read and agreed to the published version of the manuscript.

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Katarzyna KILIAŃSKA<sup>1</sup>

## PRO-ENVIRONMENTAL ACTIVITIES AND SOCIAL EXPECTATIONS IN THE FOOD INDUSTRY: A SURVEY OF THE ŚWIĘTOKRZYSKIE VOIVODESHIP

In the face of the climate crisis, society increasingly expects companies to take action to minimize their operations' negative impact on the natural environment. The article examines societal expectations regarding environmental actions undertaken by companies in the food industry. A survey conducted on a sample of 668 respondents demonstrated that society strongly expects companies to take actions aimed at reducing resource and energy consumption. The research also showed that women and individuals over 35 are more likely to advocate for companies to take pro-environmental actions. It has been proven that individuals with solid expectations for companies to take environmental actions are more willing to pay a higher price for their products.

**Keywords:** corporate social responsibility, social expectations, environment, society, food industry.

### 1. INTRODUCTION

The ongoing climate changes are undoubtedly linked to human activity. Consumerism leads to increased production of various goods, including food, resulting in higher resource and energy consumption by companies producing food items. Decisions made within these companies regarding sourcing raw materials, energy, organizing production processes, or collaborating entities have a fundamental impact on the state of the environment (Brajer-Marczak, Piwowar-Sulej, 2023) and the pace of climate change.

As K. Davis (1960) noted, a company's market success, understood as profit maximization and value for shareholders, can only be ensured by socially responsible behavior – including towards the natural environment. Companies realize that maintaining their market position and development and maximizing the chance to strengthen their competitive position depends on their ability to respond to societal expectations and incorporate environmental issues into their development strategies. It is also important to establish partnerships with contractors undertaking pro-environmental initiatives (Hejazi,

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<sup>1</sup> Katarzyna Kiliańska, Kielce University of Technology, Poland; e-mail: [kkilianska@tu.kielce.pl](mailto:kkilianska@tu.kielce.pl). ORCID: 0000-0002-9170-266X.

Batati, Bahurmuz, 2023). Companies increasingly incorporate environmental goals into their development strategies (Rosińska-Bukowska, 2022). This indicates that undertaking environmental actions is not solely aimed at obtaining a so-called “social license to operate” for companies (Islam, Ali, Asad, 2019) but also from a sense of obligation and taking responsibility for the consequences of their actions. Therefore, it is crucial to provide companies with knowledge about environmental actions, the implementation of which will reflect responsiveness to societal expectations in this regard. Moreover, studies on consumers’ willingness to pay a premium for environmentally friendly products are particularly important for enterprises. However, previous research has primarily focused on customer declarations, overlooking their expectations regarding the actual implementation of pro-environmental initiatives by companies. This article fills this gap by revealing the relationship between social expectations of pro-environmental engagement and consumers’ willingness to bear additional costs. Considering the above, the article aims to examine societal expectations regarding environmental actions undertaken by companies in the food industry.

The article is structured as follows: the first section provides a literature review focusing on societal expectations regarding corporate engagement in environmental activities. Subsequently, attention is drawn to the ambiguity of research findings regarding customers' willingness to pay a higher price for products from companies undertaking environmental actions. The following section describes the research methodology and presents the results obtained. The article concludes with a synthetic summary.

## **2. LITERATURE REVIEW**

### **2.1. Societal expectations regarding corporate engagement in environmental actions**

Corporate environmental actions contribute significantly to the business sphere's pursuit of sustainable development goals. This contribution is partly shaped by society: its expectations regarding corporate environmental activities are one of the stimuli driving the engagement of economic entities (Fallah-Shayan, Mohabbati-Kalejahi, Alavi, Zahed, 2022). Society is concerned about environmental protection issues and the rapid depletion of natural resources (Musova, Musa, Matiova, 2021) and increasingly expect companies to help address global challenges in sustainable development (Atif, Bottura, Yasin, 2023; Kiliańska, Krechowicz, 2021).

Pressure is exerted on companies to undertake environmental actions (Kowalczyk, Kucharska, 2020; Fosu, Fosu, Akyina, Asiedu, 2024) in order to minimize their negative impact on the environment. The results of a study conducted in 74 cities across 27 countries or territories indicate clear consumer support for sustainable development and a sense of civic duty. According to this study, 43% of respondents expect companies to be responsible for their environmental impact (Global Consumer Insights Survey 2020). Research also shows that societal expectations lead to the implementation of environmental planning and energy management in companies (Adah-Kole, Jafari-Sadeghi, Kock, Haddoud, Sakka, 2023) – companies respond to environmental and societal expectations (Musova et al., 2021). It has also been demonstrated that stakeholder pressure on companies positively impacts the environmental efficiency of economic entities (Xie, Abbass, Li, 2024).

How companies build their supply chain is directly linked to sustainable development (Le, 2023). Society recognizes eco-friendly supply chain management as one of the pillars of sustainable development (Saeed, Jun, Nubuor, Priyankara, Jayasuriya, 2018) and expects companies to take environmental actions themselves and collaborate with

counterparts who do so. Society expects material, information, and capital flow management to be based on collaboration among companies along the supply chain, which simultaneously consider goals set in all three dimensions of sustainable development: economic, environmental, and social (Hejazi et al., 2023; Kaźmierczak, 2016). Therefore, companies should not limit setting environmental goals to themselves. They should extend such requirements to the counterparts they collaborate with and form the supply chain (Mishra, Singh, Rana, 2022). This creates a “domino effect” – societal expectations regarding companies' eco-friendly activities also lead them to demand such actions from their counterparts.

Society recognizes the impact of production processes and purchasing decisions on the environment. Consequently, consumers increasingly consider environmental issues when making purchasing decisions (Darnall, Ji, Vázquez-Brust, 2018). By purchasing products from entities undertaking environmental actions, consumers appreciate that these companies meet their expectations. This motivates companies to engage in environmental activities because it allows them to retain current customers, attract new ones, and positively impact financial performance (Wen, Cheah, Lim, 2023). Additionally, offering environmentally friendly products and processes builds a competitive advantage (Chen, Akmalul'Ulya, 2019).

It should be emphasized that companies' engagement in environmental activities may be perceived differently by society. Some may view it as stemming from ethical motives, while others may see it purely driven by economic motivations (Windsor, 2006). According to Pan, Abbas, Álvarez-Otero, Khan, and Cai (2022), as consumers become increasingly aware of the relationship between the state of the environment and the competitive nature of the market, companies more frequently undertake various actions to improve their reputation and financial performance. Additionally, societal reactions to environmental actions taken by companies may vary depending on the age, gender, education, or professional status of social groups.

According to research, Generation Y more often than other generations considers companies' environmental actions when making purchasing decisions (Ahmad, 2019; Chatzopoulou, Kiewiet, 2021). However, other studies have shown that younger individuals are more open to and expect environmental actions (Dickson, 2001; Elias, 2004). Therefore, research findings in this area are ambiguous.

It has been proven that environmental actions taken by companies can encourage women to purchase eco-friendly products (Fotopoulos, Krystallis, 2002; Park, Choi, Kim, 2012; Siuda, 2022) because they are more aware of environmental issues (Shauki, 2011; Bojanowska, Kulisz, 2020).

Research from 2021 provided evidence that with increased education, Polish consumers are more inclined to make purchasing decisions in the food market that favor climate protection (Kurowski, Rutecka-Góra, Smaga, 2022).

## **2.2. The willingness to pay a higher price for a product from a company undertaking environmental actions**

Limiting the negative impact of business activities on the environment requires financial investment. Adapting operations to stringent environmental standards and implementing actions beyond legal requirements often necessitates investment. The costs of investment often lead to an increase in the price of products the company offers. Therefore, it is essential to investigate consumers' willingness to pay a higher price for a product from A company undertaking environmental actions.

Research on customers' willingness to pay a higher price for products offered by entities setting social and environmental goals is inconclusive. The results of some studies indicate that customers are willing to pay a higher price when purchasing products from entities engaging in environmental actions (Gatti et al., 2022; Changa, Chenb, 2022; Ching-Wei, 2017; Leonidou, Leonidou, Kvasova, 2010). Studies conducted among Polish consumers also yield similar conclusions (Wójcik, 2014; Sawicka, Marcinkowska, 2022). However, other studies have shown that a higher price for responsibly produced goods negatively affects purchase intentions among both Polish consumers and citizens of other countries (Cloca, Abdullah, Ivascu, Sarfraz, 2021; Oke, McKenzie, Osobajo, Lawani, 2023). Research examining the actual purchasing behavior of customers and food products also shows that they are unwilling to pay a higher price for goods that do not contribute to high carbon dioxide emissions. Environmental issues were found to be secondary in purchase decision-making (Vanclay, Shortiss, Aulsebrook, Gillespie, Howell, Johanni, 2011).

### 3. EMPIRICAL MATERIAL AND RESEARCH METHODS

To achieve the research goal specified in the introduction, three research questions were posed:

- Research Question 1: What environmental action does society most expect to be undertaken?
- Research Question 2: Do and how do socio-demographic characteristics differentiate expectations regarding corporate environmental actions?
- Research Question 3: Does the willingness to pay a higher price for a product depend on the strength of expectations regarding corporate environmental actions?

A primary study was conducted using the diagnostic survey method to achieve the set goal and find answers to the research questions. The study adopted a purposive method of selecting units for the sample. The scope of the research covered residents of the Świętokrzyskie Voivodeship with income and related to their expectations regarding environmental actions by companies in the food industry. The study focused on the food industry because it plays a significant role in developing the Świętokrzyskie Voivodeship. In the Regional Innovation Strategy of the Świętokrzyskie Voivodeship 2030+, two intelligent specializations related to the food industry were highlighted: modern agriculture and food processing (Regional et al. of the Świętokrzyskie Voivodeship 2030+, 2021).

Respondents provided answers to survey questions through face-to-face questionnaire interviews (PAPI), computer-assisted personal interviews (CAWI), and computer-assisted telephone interviews (CATI). After conducting a formal control of respondents' answers, data from 668 survey questionnaires were included in the analysis. The sample structure is presented in Table 1. An equal number of women and men participated in the study. The most significant portion of respondents were 65 years old or older (25.6%), had higher education (46.56%), and worked in non-managerial positions (45.66%).

The data analysis used elements of descriptive statistics and frequency analysis. The non-parametric Mann-Whitney U test (Z) and the significance test for one-way analysis of variance ANOVA Kruskal-Wallis' rank (H) were employed to compare the average level of the dependent variable between independent observation groups. For each test, it was established that the result is statistically significant and allows rejecting  $H_0$  (distributions in compared groups are equal) in favor of  $H_1$  (distributions in compared groups are not equal) if  $p < 0.05$ . Effect size indicators were utilized to determine the strength of the

relationship between variables: Glass's two-sample correlation coefficient ( $r_g$ ) or epsilon-squared ( $\epsilon^2$ ). Calculations were performed using Statistica 13.3 software.

Table 1. Structure of the research sample

	<i>N</i>	%		<i>N</i>	%
<b>Gender</b>			<b>Education</b>		
Women	334	50	Primary	23	3,44
Men	334	50	Basic vocational	65	9,73
<b>Age</b>			Moderate	269	40,27
18-24)	24	3,59	Higher	311	46,56
<25-34)	113	16,92	<b>Occupational status</b>		
<35-44)	122	18,26	Business owner	64	9,58
<45-54)	108	16,17	Managerial employee	122	18,26
<55-64)	130	19,46	Non-managerial employee	305	45,66
<65 and older	171	25,60	Retiree/pensioner	177	26,50
<b>Total</b>				<b>668</b>	<b>100%</b>

Source: Own elaboration.

A proprietary research tool was employed in the survey study. Brainstorming techniques were used with experts in Corporate Social Responsibility (CSR) and Environmental, Social, and Governance (ESG) to prepare this tool. Through brainstorming, environmental actions listed in the survey questionnaire were determined. The questionnaire included statements (Table 2) reflecting respondents' expectations regarding companies' engagement in the food industry in environmental actions (statements 1–5). Statement 6 concerns the willingness of companies striving to achieve environmental goals to pay a higher price for a product.

Table 2. Legend of symbols corresponding to statements included in the study

No	Symbol	Statements
1	Collaboration_CSR	Companies should collaborate with suppliers who engage in socially responsible actions (including environmental ones).
2	Law	Companies should undertake environmental actions beyond what is required by law.
3	Resources_energy	Companies should take action to reduce resource and energy consumption.
4	Certificate	Companies should use environmentally certified materials in production, even if they are more expensive than uncertified materials.
5	Collaboration_protection	Companies should collaborate only with suppliers who adhere to environmental protection principles.
6	Acceptance_price	I am willing to pay more for products from companies striving to achieve environmental goals.

Source: Own elaboration.

#### 4. RESEARCH RESULTS PRESENTATION

##### 4.1. Social Expectations Regarding Corporate Environmental Actions

Participants were asked to rate the alignment of their opinions with specific statements on a Likert scale, where 1 indicates complete disagreement, and 5 indicates complete agreement. The percentage distribution of respondents' responses is presented in Table 3, while Table 4 provides descriptive statistics for the alignment ratings of respondents' opinions with each statement they referred to. Based on the data contained therein, it can be observed that respondents most strongly expect companies to undertake actions aimed at reducing resource and energy consumption. The sum of ratings 4 and 5 for this action is 78.29%. The sum of responses indicating that respondents instead or do not expect companies to reduce resource and energy consumption is the lowest among all actions at 5.08%. Notably, the smallest portion of respondents chose the neutral rating "3". Additionally, the fact that, according to respondents, companies intending to implement environmental actions should primarily focus on reducing resource and energy consumption is confirmed by the lowest standard deviation value ( $SD=0.91$ ), highest values of the lower quartile ( $Q1=4$ ), and skewness coefficient ( $SKE=0.93$ ) (see Table 4).

Table 3. Distribution of ratings of respondents' agreement with statements (%)

		Rating of respondents' agreement with the statement				
		1	2	3	4	5
Statement	Collaboration_CSR	3,59	7,04	32,19	34,28	22,9
	Law	2,84	5,53	28,44	33,98	29,19
	Resources_energy	0,89	4,19	16,62	35,48	42,81
	Certyfikat	5,59	11,53	27,69	27,69	26,5
	Collaboration_protection	3,14	5,69	29,79	33,83	27,99

Source: Own elaboration.

Table 4. Descriptive statistics for the rating of respondents' agreement with the statement

		Descriptive statistic value					
		<i>M</i>	<i>SD</i>	<i>Q1</i>	<i>Me</i>	<i>Q3</i>	<i>SKE</i>
Statement	Collaboration_CSR	3,56	1,02	3	4	4	-0,49
	Law	3,81	1,00	3	4	4	-0,61
	Resources_energy	4,15	0,91	4	4	5	-0,93
	Certificate	3,56	1,18	3	4	5	-0,47
	Collaboration_protection	3,77	1,02	3	4	5	-0,58

*Min* – minimum, *Max* – maximum, *M* – mean, *SD* – standard deviation, *Me* – median, *Q1* – lower quartile, *Q3* – upper quartile, *SKE* – skewness coefficient.

Source: Own elaboration.

The frequency analysis of respondents' responses indicates that the minor portion expects companies to use environmentally certified materials in production processes, even if their cost is higher than uncertified materials. For the first of the mentioned actions, the sum of ratings 4 and 5 is only 54.19%, while the sum of ratings 1 and 2 is the highest at

17.12%, with an average rating of 4.15. It can be assumed that respondents are aware that using certified materials in production processes entails higher costs for companies. The higher cost of production leads to an increase in the price of products, which respondents want to avoid.

#### 4.2. Social expectations regarding corporate environmental actions with consideration of the socio-demographic characteristics of the respondents

A series of Mann-Whitney U tests and Kruskal-Wallis ANOVA tests were conducted to examine whether there are statistically significant differences in respondents' expectations regarding corporate environmental actions with different socio-demographic characteristics. The results of the testing are presented in Table 5. Based on these results, it can be concluded that socio-demographic characteristics differentiate respondents' expectations regarding corporate environmental actions. All socio-demographic characteristics included in the study simultaneously differentiate respondents' expectations regarding corporate actions aimed at reducing resource and energy consumption.

Table 5. The relationship between socio-demographic characteristics of respondents and their expectations regarding corporate environmental actions

		Values of test statistics			
		Gender	Age	Education	Occupational status
Statement	Collaboration_CSR	<b>Z=2,954</b> <b>p=0,003</b> <b>r<sub>g</sub>=0,114</b>	<b>H=13,303</b> <b>p=0,021</b> <b>ε<sup>2</sup>=0,020</b>	H=0,883 p=0,829 ε <sup>2</sup> =0,001	<b>H=10,457</b> <b>p=0,015</b> <b>ε<sup>2</sup>=0,016</b>
	Law	<b>Z=3,294</b> <b>p=0,000</b> <b>r<sub>g</sub>=0,127</b>	H=4,110 p=0,533 ε <sup>2</sup> =0,006	H=6,865 p=0,076 ε <sup>2</sup> =0,010	H=3,721 p=0,293 ε <sup>2</sup> =0,006
	Resources_energy	<b>Z=2,995</b> <b>p=0,002</b> <b>r<sub>g</sub>=0,115</b>	<b>H=11,075</b> <b>p=0,049</b> <b>ε<sup>2</sup>=0,016</b>	<b>H=9,704</b> <b>p=0,021</b> <b>ε<sup>2</sup>=0,015</b>	<b>H=14,564</b> <b>p=0,002</b> <b>ε<sup>2</sup>=0,022</b>
	Certificate	Z=0,327 p=0,743 r <sub>g</sub> =0,013	H=5,056 p=0,409 ε <sup>2</sup> =0,008	H=6,290 p=0,098 ε <sup>2</sup> =0,009	<b>H=19,495</b> <b>p=0,000</b> <b>ε<sup>2</sup>=0,029</b>
	Collaboration_protection	<b>Z=3,508</b> <b>p=0,000</b> <b>r<sub>g</sub>=0,136</b>	H=6,572 p=0,254 ε <sup>2</sup> =0,009	H=2,059 p=0,560 ε <sup>2</sup> =0,003	H=2,604 p=0,456 ε <sup>2</sup> =0,004

Legend-bolded values of test statistics indicate the statistical test result, allowing the reject Ho.

Source: Own elaboration.

Gender differentiates respondents' expectations regarding corporate actions for four out of the five analyzed actions. Regardless of the action, women more frequently than men declared that companies should engage in environmental actions. The r<sub>g</sub> coefficient indicates a weak relationship between the variables.

Regarding two actions involving collaboration with entities implementing CSR activities and reducing resource and energy consumption in their operations, respondents'

expectations are differentiated by age (Table 6<sup>2</sup>). The strength of the relationship, based on the values of  $\epsilon^2$ , should be classified as moderate (King, Minium, 2020). For both actions, respondents' expectations regarding their implementation by companies are notably weaker among those aged 18-34. The percentage of responses from respondents in this age group indicating that companies should undertake the discussed actions is the lowest, averaging 47.5% for the first action and 71% for the second action. The corresponding percentage of responses from respondents in the other age groups averages 60.25% for the first action and 80.5% for the second action.

Table 6. Social expectations regarding corporate environmental actions and respondents' age

		Age					
		<18-24)	<25-34)	<35-44)	<45-54)	<55-64)	<65 and older
Collaboration CSR	Companies should not undertake this action	0%	18%	15%	8%	7%	9%
	No opinion	50%	37%	27%	30%	32%	32%
	Companies should undertake this action	50%	45%	58%	62%	62%	59%
Resources energy	Companies should not undertake this action	4%	11%	3%	6%	3%	4%
	No opinion	25%	19%	19%	13%	12%	18%
	Companies should undertake this action	71%	71%	78%	81%	85%	78%

Source: Own elaboration.

The data analysis indicates that respondents with vocational secondary education have lower expectations than other groups regarding companies undertaking actions to reduce resource and energy consumption. 66% of respondents believe that companies should undertake this action, while 12% think they should not (see Chart 1). On the other hand, respondents with primary education most commonly expect companies to undertake this action – 87% of them believe that companies should strive to reduce the amount of resources and energy they consume. In this group of respondents, no single person stated that companies should not undertake this action.

The distribution of respondents' responses, along with the heatmap presented in Table 7, indicates that owners most frequently expect (66%) companies to consider in their selection of contractors whether they are implementing CSR activities – including environmental actions. Owners are often the decision-makers regarding with whom the company will collaborate. Therefore, it can be assumed that in the future, the fact that contractors engage in socially responsible activities will become increasingly important when selecting entities with which companies will cooperate. This may lead to the “domino effect” – entrepreneurs expecting social and environmental activity from contractors will motivate them to engage in such activities.

<sup>2</sup> To improve readability, the answers 'I completely agree' and 'I rather agree' were aggregated, as well as the answers 'I rather disagree' and 'I completely disagree'.

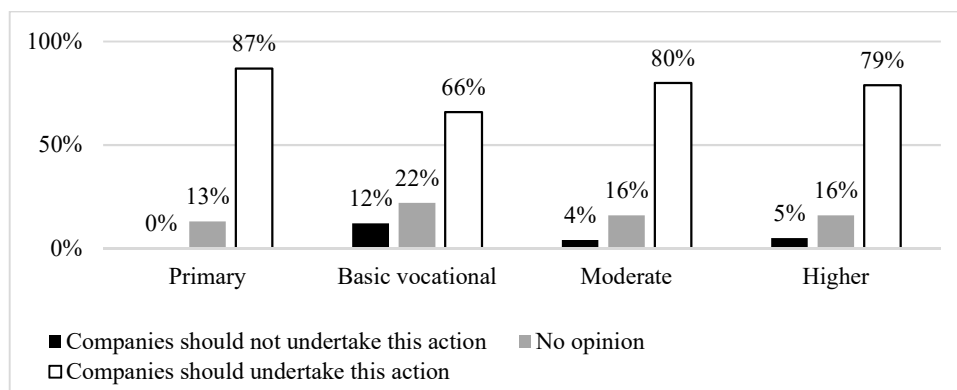


Chart 1. Social expectations regarding companies' undertaking of actions to reduce resource and energy consumption, by respondents' education level

Source: Own elaboration.

Table 7. Social expectations regarding companies' undertaking of environmental actions are based on respondents' occupational status.

		Occupational status			
		Retiree/pensioner	Non-managerial employee	Managerial employee	Owner
Collaboration_CSR	Companies should not undertake this action	8%	13%	9%	10%
	No opinion	31%	35%	32%	24%
	Companies should undertake this action	61%	52%	59%	66%
Resources_energy	Companies should not undertake this action	3%	5%	5%	9%
	No opinion	19%	14%	11%	33%
	Companies should undertake this action	78%	81%	84%	58%
Certificate	Companies should not undertake this action	15%	25%	11%	9%
	No opinion	27%	30%	28%	17%
	Companies should undertake this action	58%	45%	61%	74%

Source: Own elaboration.

Noticeably, a significantly higher percentage of owners (33%) had difficulty determining their own expectations regarding businesses undertaking actions to reduce

resource and energy consumption compared to the average for other professional groups (15%). Additionally, a distinctly lower percentage of owners than other respondent groups believe that companies should or instead reduce resources and energy (58%; the average for other groups is 81%). This may stem from owners being the most aware of the difficulty reconciling reducing energy and resource consumption with business development. Owners may focus on achieving high production levels, which require more significant resource investments. Limiting energy consumption may become feasible when machinery is modernized, necessitating investment in new technologies and replacing (often functioning) equipment with new, energy-efficient ones. Such investments require financial outlays that owners may not always be willing to make.

In the case of using environmentally certified resources in a business, even if they are more expensive than alternatives, owners most often expect this (74%). Among owners, the lowest percentages were those of respondents who believe that companies should instead or not undertake the discussed action (9%; the average for other groups is 17%). This may be because owners see using certified resources for food production as an opportunity to distinguish their products in the market, attract new customers, increase sales volume, and gain a competitive advantage.

#### **4.3. Expectations of respondents regarding businesses undertaking environmental actions and respondents' willingness to pay a higher price for A product**

To verify whether respondents with different expectations regarding businesses undertaking environmental actions exhibit different levels of willingness to pay a higher price for a product from such businesses, a synthetic indicator (*expectations*) was created for each respondent. The indicator was calculated as the sum of the respondents' agreement ratings with statements 1–5 specified in Table 3 (the indicator ranged from 5 to 25). Then, the indicator values were assigned to three groups: no expectations or weak expectations (if the indicator values were lower than 13), moderate expectations (if the indicator values ranged from 13 to 18), and strong expectations (if the indicator values were above 18). Subsequently, it was examined whether the *expectations* variable significantly influences respondents' willingness to pay a higher price for a product from a business implementing environmental actions. A significance test was conducted for a one-factor analysis of variance (ANOVA) using the Kruskal-Wallis rank sum test ( $H=15.665$ ;  $p=0.01$ ). The test showed that the distributions of responses in the compared groups are unequal, confirming that the analyzed variables are related.

Further, a cross-analysis of respondents' responses was conducted (see Chart 2<sup>3</sup>). It can be observed that respondents who strongly expect businesses to undertake environmental actions are more willing to incur a higher cost to purchase a product from such businesses compared to respondents with weak and moderate expectations in this regard. As many as 62% of respondents who have substantial expectations regarding businesses' efforts toward environmental goals declare that they would rather pay a higher price for A product from such a business. For the remaining respondents, this percentage does not exceed 20%. Respondents with weak expectations regarding businesses' implementation of environmental actions most frequently declare that they would (39%) or rather not (34%) pay a higher price for a product from a business undertaking such initiatives. It can be concluded that the stronger the respondent expects businesses to strive towards

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<sup>3</sup> To increase the clarity of the chart, the answers “definitely and I will rather pay a higher price” and “I will probably and definitely not pay a higher price” have been aggregated.

environmental goals, the more willingly they will pay a higher price for a product from such an entity.

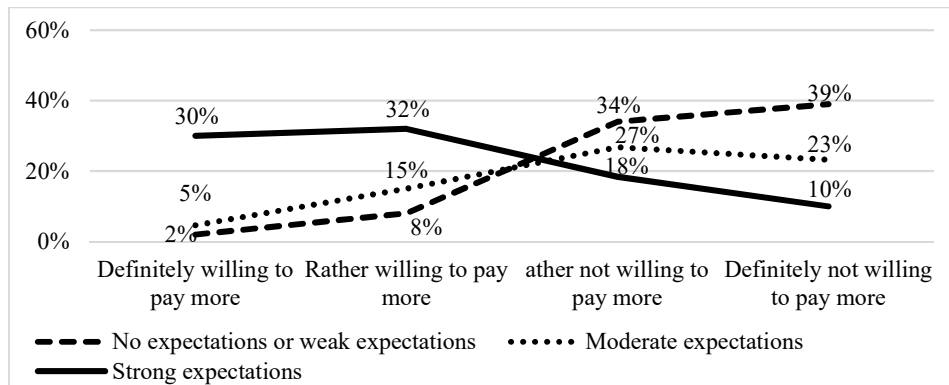


Chart 2. Expectations regarding businesses' undertaking of environmental actions and respondents' willingness to pay a higher price for a product from such businesses

Source: Own elaboration.

## 5. SUMMARY AND CONCLUSIONS

Businesses must strive to achieve economic goals. Additionally, to remain competitive, they should respect societal expectations regarding the impact of their economic activities on the natural environment. These two issues may seem contradictory, but it is possible to organize business activities to enhance the firm's value and provide environmental benefits.

Social sensitivity to the problem of excessive exploitation of the natural environment is increasing. Society expects businesses to engage in activities to improve their condition or at least minimize the negative impact of their economic activities on the environment. By implementing environmental projects that respond to societal expectations, businesses can build positive relationships with customers and other stakeholders, attract new customers, foster their loyalty, and build their competitive advantage.

The research results presented in the article have practical value: they indicate the possibilities of combining societal expectations regarding businesses' environmental actions with business practices. The research findings suggest that to increase coherence between societal expectations and businesses' activities in environmental actions; economic entities should primarily include actions in their development strategies that involve reducing resource and energy consumption and undertaking environmental actions beyond what is required by law.

An essential aspect of the research results discussed is providing businesses with knowledge about the expectations of various socio-demographic groups of respondents. This enables businesses to undertake environmental actions that specific social/demographic groups most strongly expect.

The conducted research confirmed the findings reported by Shauki (2011), Bojanowska and Kulisz (2020), and Fotopoulos and Krystallis (2002), who previously demonstrated that women, more frequently than men, expect companies to engage in pro-environmental initiatives. However, the results presented in this article are not consistent with the study by Kurowski, Rutecka-Góra, and Smaga (2022), as they do not confirm that individuals

with higher education levels more often expect enterprises to implement pro-environmental measures. The data analysis revealed that the strongest expectations in this respect were expressed by respondents with primary education. The findings further indicated that young people exhibited the weakest expectations regarding corporate engagement in pro-environmental actions. This result partially contradicts the study by Dickson (2001), yet it aligns with the conclusions drawn by Ahmad (2019) and Chatzopoulou and Kiewiet (2021).

The study also revealed that business owners perceive pro-environmental activities differently from other respondents. They expressed relatively lower expectations regarding the reduction of resource and energy consumption, which may be explained by their orientation toward production efficiency and their awareness of the technological investment costs required to implement such solutions. Business owners must reconcile environmental objectives with economic ones, which may determine their distinct position compared to other respondent groups. Similar observations were reported by Mishra, Singh, and Rana (2022), who pointed to significant implementation barriers in supply chain collaborations aimed at reducing resource use. On the other hand, business owners, more frequently than other respondent groups, supported the use of certified raw materials. This can be interpreted as perceiving such practices as a source of competitive advantage and as a means of differentiating products in the market, which is consistent with the findings of Wen, Cheah, and Lim (2023) as well as Chen and Akmalul'Ulya (2019).

It has been demonstrated that the willingness to pay a higher price for a product depends on the strength of respondents' expectations regarding businesses undertaking environmental actions. Therefore, businesses should communicate directly with the public to inform them of their engagement in environmental activities. This way, part of society that strongly expects such actions will be reassured that it is worthwhile to buy products from businesses undertaking environmental actions rather than from competitive entities. Repeat purchases will shape habitual buying behavior and even loyalty toward the company.

Given the constantly occurring undesirable climate changes shifting consumer expectations, attitudes, and purchasing behaviors, it can be speculated that in the future. A strategic approach to environmental actions will become increasingly important. Monitoring societal expectations in this regard will allow businesses to incorporate into the development strategies that society expects them to undertake.

The author has read and agreed to the published version of the manuscript.

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Jiratchaya KOSINTHARANON<sup>1</sup>

## A CRITIQUE ON CREATIVE ECONOMY AS A POTENTIAL TOOL FOR THE PROMOTION OF THAILAND'S SUSTAINABLE DEVELOPMENT POLICY

Nations face an urgent necessity to develop sustainable development policies, but adopting foreign models is impractical due to unique national contexts. This research evaluates the creative economy's potential to propel national sustainable development. The study utilizes a qualitative methodology combining content analysis of four strategically selected countries to establish a global conceptual framework, alongside an in-depth case study of Thailand. Results indicate that while Thailand's creative economy theoretically aligns with 10 of the 17 Sustainable Development Goals (SDGs), actual national progress remains lagging. The main contribution of this paper is demonstrating that policy effectiveness must be evaluated against real-world implementation rather than merely policy on paper. The practical implication is that policymakers must assess national circumstances alongside policy frameworks to ensure the feasible and effective implementation of the creative economy for sustainable development.

**Keywords:** sustainable development, creative economy, Thailand.

### 1. INTRODUCTION

Development is inherently a transboundary issue that necessitates a multidimensional approach (Robinson, 2007; McGillivray, 2012) to enhance the adequate quality of life for global citizens (Bertrand, 2008). Development must transcend merely ensuring a decent standard of living (Kaldor, 2007) and should, in the long term, secure human well-being, particularly since the concept of sustainable development gained prominence (McMichael and Philip, 2008). In the global pursuit of sustainable development, the United Nations established a comprehensive framework: the 17 Sustainable Development Goals (SDGs), which serve to monitor the progress of nations in driving this essential development (UNDP, 2022).

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<sup>1</sup> Jiratchaya Kosintharanon, Chulalongkorn University, Thailand; e-mail: jiratchaya.kos@gmail.com.  
ORCID: 0009-0004-1895-2111.

The creative economy has been identified as one of the potential tools to operationalize this new development approach. It functions by utilizing existing resources – such as human capital, culture, and creativity – to foster economic growth that can lead to long-term sustainable development. This model was famously claimed to be a strategy for revitalizing cities following the challenges of deindustrialization, as it not only stimulates economic activity but also strengthens other dimensions of development (Creative Economy Programme by UNCTAD; Pholphirul, 2013).

The significant point is that it was implemented differently in the world with some mutuality which is interesting to see how this concept is used to drive the development to be an effective development tool. Hence, the problem statement is to analyze the creative economy to reveal the significance of the creative economy and also critique its effectiveness by particular case study among diverse usage in the world to see how it could make a progress towards sustainable development.

## 2. LITERATURE REVIEW

Development is a multidimensional undertaking that transcends mere economic growth; it inherently requires the enhancement of human well-being, equality, and adequate living conditions for global citizens (Kaldor, 2011; Kingsbury et al., 2012). The global pursuit of this holistic development approach is comprehensively encapsulated in the United Nations' 17 Sustainable Development Goals (SDGs), which mandate the integration of economic, social, and environmental dimensions to secure long-term human prosperity (UNDP, 2022). Achieving these goals necessitates innovative national strategies, as there is no universal framework that fits all unique domestic contexts (Monkelbaan, 2019).

The creative economy has emerged as a potential strategic approach to operationalize this sustainable development. Originating as a survival strategy to revitalize post-industrial cities, it functions by utilizing non-economic resources – such as human capital, cultural heritage, and intellectual property – to foster socio-economic growth (Pholphirul, 2013; UNCTAD, 2018). Prominent international institutions recognize the creative economy as a knowledge-based system capable of generating extraordinary wealth while simultaneously promoting cultural diversity, social inclusion, and human development (Howkins, n.d.; Santos-Duisenberg, 2017). Furthermore, during times of global volatility such as the COVID-19 pandemic, the creative sectors demonstrated significant resilience and adaptability (Khlystova, Kalyuzhnova, Belitski, 2022). Consequently, the creative economy is widely adopted by state authorities worldwide as a new growth engine.

Despite its global recognition, the literature reveals inconsistencies and gaps in comparative evaluations regarding the actual effectiveness of these diverse national strategies. The inherent flexibility of the creative economy means it is interpreted and implemented differently across various nations based on local necessities and political agendas (United Nations, n.d.). While many countries claim the creative economy as a development tool, there is a lack of concrete assessments measuring their unique policy interpretations against standardized global frameworks like the SDGs. This contradiction between policy on paper and real-world outcomes necessitates a critical comparison between the global ideal types of the creative economy and specific local contexts. As a future step, research and policy approaches must evaluate whether the theoretical potential of the creative economy translates into effective sustainable development in

reality, thereby providing a more accurate assessment to solve the identified domestic challenges (Rubik, 2012).

### 3. METHODOLOGY

This research utilizes a qualitative research methodology based on two major methods: Content Analysis and Case Studies.

**Research questions and objectives:** building upon the gaps identified in the literature review, the primary research question is “How does the creative economy play a role in Thailand’s development?”. The main objective of this research is to critique Thailand’s creative economy concept by comparing it against international best-practice models. This objective will be achieved by answering three sub-questions about the ideal type of global creative economy, Thailand’s creative economy and its effectiveness in the national level. This research employs a qualitative methodology based on two integrated approaches as follow.

**Content analysis:** To establish a grounded conceptual framework of the creative economy as a development tool, secondary data is gathered from four strategically selected countries. Formulating this framework accounts for diverse global interpretations, which is crucial for analyzing the subsequent case study. Furthermore, this method will be applied to identify similarities and differences between Thailand’s interpretation of the creative economy and the global ideal type – a synthesized model representing the shared characteristics, core mechanisms, and best practices of successful creative economies worldwide. Ultimately, this comparison will assess the effectiveness of Thailand’s approach in driving sustainable development. Data collection primarily relies on official documents, such as national strategies and development plans, sources from key governmental institutions in the selected countries.

**Case study:** To accurately illustrate the creative economy’s potential for a country, a specific, in-depth case study of Thailand is essential. This method will investigate the rise of the creative economy within Thailand’s national context, its significance for achieving sustainable development, and the overall effectiveness of its implementation, this includes examining Thailand’s unique interpretation of the concept and how the state authority has integrated the creative economy into its national development strategy.

This case study analysis will refer to the data collected via content analysis (method 1) to critique and assess the potential of Thailand’s creative economy. The effectiveness of Thailand’s creative economy will be subsequently measured against the 17 Sustainable Development Goals (SDGs), which serve as the global consensus framework for evaluating a country’s progress toward sustainable development.

**Rationale for case study selection:** Thailand is selected as the case study because, despite possessing abundant resources to drive sustainable development, it remains a developing country struggling with persistent societal gaps and poverty rates. Additionally, the United States, the United Kingdom, Japan, and the Republic of Korea were strategically selected for comparison because they represent distinct, successful global models that parallel Thailand’s development ambitions: the U.S. for leveraging cultural diversity, the U.K. for national branding, Japan for utilizing cultural authenticity to strengthen soft power, and the Republic of Korea for dynamic innovation and content export. The 17 SDGs will, therefore, provide a concrete measure of Thailand’s progress toward sustainable development goals, allowing the research to argue that the creative

economy's effectiveness directly correlates with Thailand's ability to accomplish its current national development objectives.

#### 4. RESULTS

##### A. The creative economy

The creative economy is recognized as a potential strategic approach utilized by state authorities, uniquely connecting various development fields through the intrinsic relationship between creativity and economics. Essentially, the creative economy is a knowledge-based system capable of generating socio-economic growth and development while simultaneously promoting essential outcomes such as cultural diversity, social inclusion, and human development. As the creative economy has the capacity to serve as a development tool, its underlying notion represents a viable means to foster national sustainable development. This potential was highlighted by John Howkins, who noted that the creative economy can generate extraordinary value and wealth (Howkins, 2001).

Since creativity has become a powerful factor driving economic growth in the globalized world, the creative economy concept has been widely adopted across many nations, particularly in least developed countries. Its implementation is often spurred by major stimulators, primarily the government or state authority. Consequently, the creative economy is adapted and interpreted differently across the globe, though with certain overlapping characteristics (United Nations Economist Network, pp.1-3).

The creative economy has garnered significant attention from various countries and international organizations exemplified by the United Nations designating 2021 as the International Year of Creative Economy for Sustainable Development (UNCTAD, 2021). This illustrates the global recognition of the creative economy's potential to sustain and promote economic growth, especially among least developed countries. However, because the creative economy is a flexible option that can be adapted to specific national conditions, defining and assessing its effectiveness poses a challenge.

Therefore, this research aims to establish a global concept of the creative economy by selecting four countries – the United States, the United Kingdom, Japan and the Republic of Korea – to critique the diverse interpretations of the creative economy as a development strategy. The illustration below highlights the varying approaches taken by these four case studies, as illustrated in Table 1.

Table 1. Diverse usage and interpretation of the creative economy by four case studies

Content	The creative economy	The role of creative economy towards the sustainable development
The United States	Creative and artistic sector	<ul style="list-style-type: none"> <li>• Biden-Harris administration's policy agenda and "Build back again"</li> </ul>
	Creative solution to accelerate progress at home and renew American position by strengthening the soft power through strong networking	<ul style="list-style-type: none"> <li>• Data-driven discipline and localization</li> <li>• Fact sheet for the U.S. global development priority and other support mechanism</li> </ul>

Table 1 (cd.). Diverse usage and interpretation of the creative economy by four case studies

Content	The creative economy	The role of creative economy towards the sustainable development
The United Kingdom	Creative and digital industries	<ul style="list-style-type: none"> <li>• Potential tool for resilient, inclusive, and sustainable development</li> </ul>
	The creative powerhouse which could stimulate the national growth from creativity in terms of content, R&D, the pool of talent	<ul style="list-style-type: none"> <li>• Sustainable development plan for 2020-2025. To achieve the sustainable development</li> </ul>
Japan	Creative and cultural industries	<ul style="list-style-type: none"> <li>• For strong, inclusive and sustainable growth and also keep peace and prosperity with national security</li> </ul>
	National strategy to revitalize country's financial economies in post-industrial era	Reiwa 5 <sup>th</sup> year edition – the white paper and SDGs plan: economic growth, skill pipeline, financial resilience and equality
South Korea	Cultural and creative sector	<ul style="list-style-type: none"> <li>• The rebranding and reconstruct the economic system through five-year national plan of Korea's green economy</li> </ul>
	Rebranding strategy for country such as financial crisis and income equality which shifted the national strategy with digital economy	<ul style="list-style-type: none"> <li>• Three-year plan for economic innovation to boost domestic demand and 2<sup>nd</sup> five-year national plan for Korea's national strategy</li> <li>• Inclusive creative economy: a sustainable and robust economy for all, global responsibility: strengthening partnership for the SDGs</li> </ul>

Source: (Jiratchaya, 2022).

The figure above illustrates the diverse implementation of the creative economy across the four countries, revealing distinct national interpretations. These varying interpretations shift in response to the specific national context and the evolving national development goals. Thus, the creative economy can be seen as a framework flexible enough to align with a nation's specific goals set of shared characteristics within the global creative economy can be identified, which will be discussed later.

### The shared characteristics of global creative economy

**Significance of creative economy:** while national development priorities vary by country, the integration of the creative economy into development strategies is a prominent global trend. Research indicates that various nations have successfully incorporated the creative economy into their strategic frameworks to drive progress. This model is increasingly recognized as a vital pathway toward sustainable development, as it bridges the gaps between social, economic, cultural and human development. Most nations adopt a multi-faceted approach that emphasizes social inclusion and equality while leveraging existing resources – specifically culture, creativity and intellectual property. This synergy is viewed as essential for securing long-term economic growth. To succeed, countries must design effective mechanisms that align the creative economy with their specific national contexts.

**The creative sector:** Despite diverse interpretations, a core shared characteristic of the global creative economy is the formal identification of a creative sector. The most prominent shared definition across the globe identifies this sector as industries or capital that prioritize culture, creativity, and human capability over pure technological advancement. This manifests in various forms, including digital content, physical products and services such as tourism and recreation.

Each country has classified the creative industries differently, but also has the main grouping of industries which are all considered as the creative sector as follows figure.

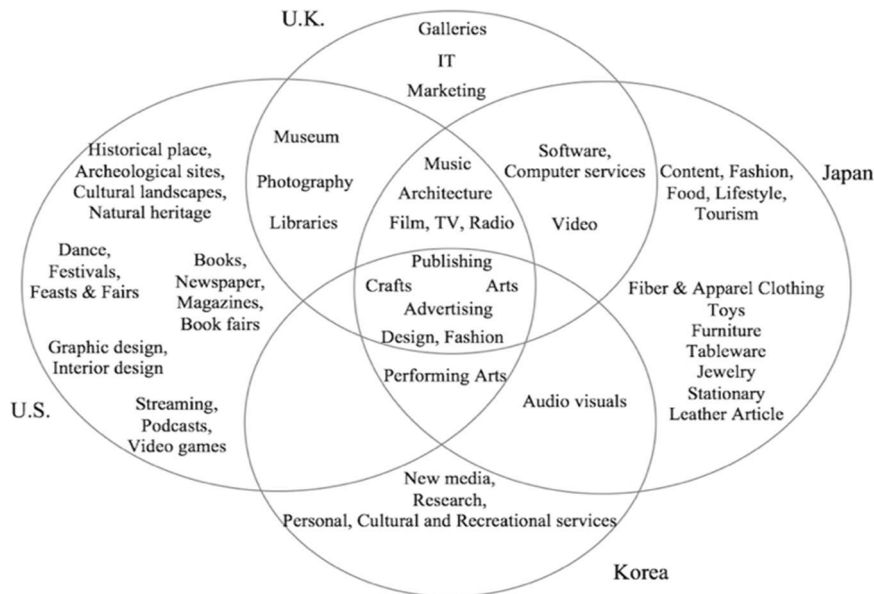


Figure 1. The classification of creative sector

Source: Adapted from U.S. Policy cycle (2023), UK DCMS (2022), Hakuhodo (2010), and UNCTAD (2014) by Author.

While each country classifies creative industries differently, there is a common grouping of sectors as illustrated in Figure 1. For instance, case studies of the U.S., U.K., and Japan reveal universal recognition of industries such as Music, Architecture, and Film, TV, & Radio as core creative sectors. Although terminology and sub-sectors may vary, these nations share a fundamental understanding of what constitutes the creative sector. Ultimately, these industries are rooted in artistic expression and intellectual property, which in the modern era must integrate with new media and innovation to influence manufacturing and global services.

**Mechanism of global creative economy:** The global creative economy operates through the generation and exploitation of intellectual property and human endeavor. Non-economic capital is utilized through the creative sectors mentioned previously. Many countries have shifted their development strategies toward “creative solutions” that utilize mechanisms not found in traditional industries, which are demonstrated in Figure 2:

- **The Value-Adding Process:** This involves transforming original capital into high-value products through rebranding or storytelling. Nations determine the most appropriate processes to drive this economy, leading to unique national interpretations. These value-added products span manufacturing, goods, and services, including lifestyle content and tourism.
- **Cross-Sector Integration:** Because value-added products often overlap between sectors, some countries establish specific classifications for cross-creative or creative-driven industries. These efforts strengthen the creative environment and foster networking among stakeholders, supported by state policies and social inclusion initiatives.
- **Environment and Networking:** A robust ecosystem is crucial for the development of a country's creative economy. Because individuals are the primary drivers of this sector, policies must focus on human development to help talents reach their full potential. This is why most global creative economy models emphasize social inclusion and participation without discrimination.

Recently, the creative economy has largely remained a top-down strategy initiated by governments and ministries. While national development plans often frame it as a “new growth engine”, they rarely highlight the individual willingness to promote the economy; instead, it is presented as a national solution requiring broad public participation.

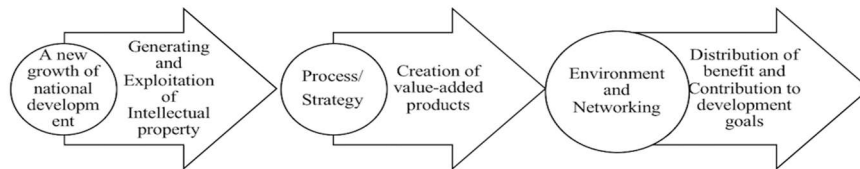


Figure 2. Mechanism of global creative economy

Source: (Jiratchaya, 2022).

The creative economy in these countries is designed to achieve diverse development goals, including social, economic, human, and environmental progress. While these nations touch upon various fields, the primary focus remains on socio-economic aspects to reach sustainable development in the future. To succeed, they must align their creative economy frameworks with the three pillars of sustainable development recognized globally.

## B. Thailand's creative economy

**Economic context and challenges** Thailand remains trapped as an upper-middle-income country due to structural factors and limited resources, characterized by a low ratio of domestic value generation and an absence of domestic technology and key material usage. Hence, the primary challenge for the Thai government is to alleviate poverty and prepare citizens for developed-country status (Thai Khu Fah journal, 2018). The shift in Thailand's development aims to overcome these national limitations while maximizing the utility of existing resources to sustain long-term development. According to the 13th National Development Plan, the government is promoting the transformation of the manufacturing sector into an innovation-driven economy. Within this framework, the creative economy is recognized as a strategic solution that gained prominence during the financial crisis, where those involved in the creative sector proved to be resilient survivors

because they successfully utilized intellectual property, cultural assets, and creative adaptability to overcome economic stagnation.

The resilience of the creative sector was first established during the 2007–2008 Global Financial Crisis, where it emerged as a “survivor” by utilizing intellectual property and creative adaptability to overcome economic stagnation. During this period, creative exports continued to grow globally by over 14% annually, outperforming traditional manufacturing sectors that suffered significant declines (Creative Economy Agency [CEA], n.d.; UNCTAD, 2018). This capacity for recovery was further validated during the recent COVID-19 pandemic, where businesses successfully leveraged creativity and digitalization to navigate financial hardship and stimulate economic activity (Khlystova et al., 2022). These recurring successes provide critical evidence that the creative economy can drive significant development and maintain stability during periods of intense global volatility (Khlystova, Kalyuzhnova, 2023).

**Global alignment and comparative analysis** Thailand’s creative economy mirrors the four case studies. Like the U.K., it sustains development while strengthening national branding; consistent with the U.S., it embraces diversity. Furthermore, Thailand highlights its authentic culture on the international stage, similar to Japan, while integrating modern platforms with a dynamism akin to the Republic of Korea. The rise of Thailand’s creative economy emerged from observing how specific groups maintained their livelihoods during severe economic downturns – most notably the 2007-2008 global financial crisis and the recent COVID-19 pandemic. Their ability to survive by successfully leveraging intellectual property, cultural assets, and creativity provided a clear solution, highlighting the outstanding significance of the creative economy in Thailand.

**Policy framework and strategic direction** the creative economy was addressed in alignment with the National Development Plan under the 20-Year National Strategy (2018–2037) and the strategic plan of the Creative Economy Agency (CEA). Furthermore, there is a trend toward moving Thailand’s creative economy into the global arena through the promotion of “Creative Business ConnexT”. This is a remarkable platform launched in 2023 by the CEA to accelerate the growth of creative businesses of all sizes. This journey recognizes that future creativity is rooted in culture and heritage, reflecting Thailand’s endeavor to move the creative economy forward. The classification of Thailand’s creative economy is shown in Figure 3 (Chakrit Pichyangkul, 2023). Thai creative economy is classified as follows:

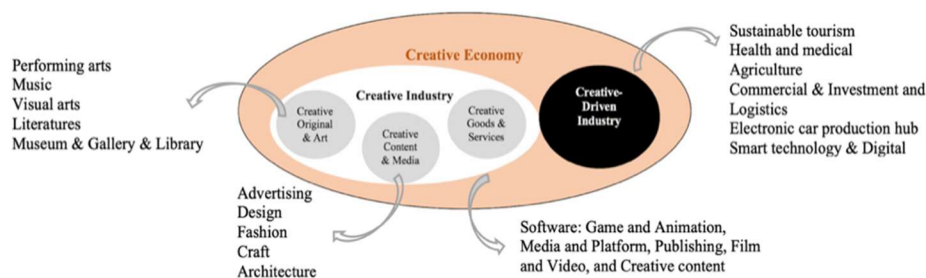


Figure 3. Thailand’s creative economy

Source: The Creative Economy Agency (2022).

In Thailand, the creative economy acts as a bridge between traditional and contemporary spaces through the application of innovation and technology, connecting to global characteristics in terms of mechanism. Cultural and creative sectors serve as raw materials scattered throughout the country, which must be processed to generate more revenue than traditional industries. These resources are initiated through human intelligence and creativity, integrated with innovation and modern strategies to maximize their potential through the value-adding process. This is evident in the realization that cultural identity and diversity across Thailand serve as the major fuel for the creative economy. However, this cultural and creative capital must pass through a value-adding process to be transformed into more valuable capital.

This capital requires a value-adding process that integrates traditional and modern strategies to achieve goals, with the outstanding feature of representing soft power through creative goods and services using storytelling. This can be presented in traditional-style products or new media via social media and online platforms. Various stakeholders ensure the creative economy is effective while resources are used productively to their full potential. This involves policymaking, the development of the creative economy, and existing tools such as R&D, technology, and the promotion of cultural exports (CEA, 2022).

The creative economy is expected to stimulate socio-economic and environmental development while partially driving human and cultural development by raising awareness of national creative goods and soft power. Thus, Thailand's creative economy is also utilized as a political tool, similar to the United Kingdom and Japan. This was observed during abnormal situations where individuals survived financial crises through the creative sector. The CEA has driven five sectors to enhance growth: Creative Business, Creative Place, Creative People, Creative Economy Database, and High-Performance Organization (The Creative Economy Agency, 2022), as depicted in Figure 4.

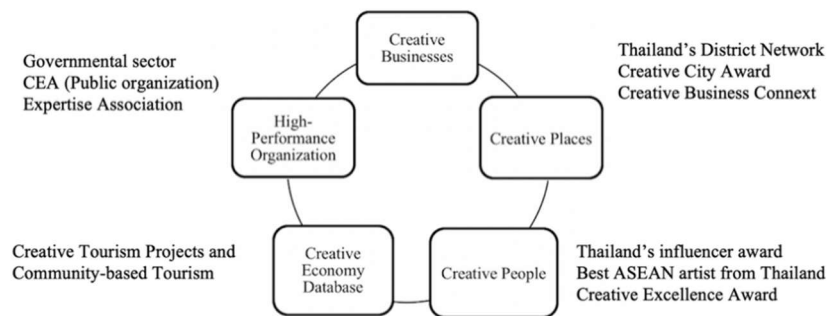


Figure 4. Thailand's creative economy

Source: The Creative Economy Agency (2022).

Based on this vision, these five strategies promote and add value to cultural products by blending them with technology and rebalancing sustainability. These five creative areas are interconnected and operate overlap with one another to lead toward sustainable development. The creative economy concept is addressed as a potential solution to tackle national issues and drive progress across multiple pillars of sustainable development. As a part of Thailand's national development strategy, this interpretation serves as an effective solution, the effectiveness of which will be discussed in the next section

### C. The effectiveness of Thailand's creative economy

Based on the interpretation of Thailand's creative economy, five primary strategies drive the sector. Various stakeholders, both domestic and international, share the responsibility for enhancing the potential of this economy, with the Creative Economy Agency (CEA) playing a central role. For these strategies to be most effective, the integration and overlapping functions within these five creative sectors must be carefully coordinated. Furthermore, evaluating the effectiveness of Thailand's creative economy requires an assessment using the 17 Sustainable Development Goals (SDGs) to determine its actual impact on national sustainable development. Table 2 illustrates Thailand's creative economy and the assessment through the 17 SDGs.

Table 2. Thailand's creative economy and the assessment through the 17 SDGs

5P	Thailand's creative economy	The 17 SDGs
<b>People</b>	Creative people, creative economy database	SDG 1, SDG 4, SDG 5
<b>Prosperity</b>	Creative business, creative place	SDG 8, SDG 9, SDG 10, SDG 11
<b>Planet</b>	Creative place, creative economy database	SDG 12
<b>Peace</b>	High-performance organization	SDG 16
<b>Partnership</b>	High-performance organization	SDG 17

Source: (Jiratchaya, 2022).

**Thailand's creative economy concepts and the SDGs:** From 5 strategies to provide the most effective creative economy from the Creative Economy Agency (CEA), Thailand's creative economy concepts have the potential to reach 10 out of the 17 SDGs through the five strategies implemented by the CEA. The interconnection within these five creative strategies allows them to drive several sustainable development goals simultaneously. It can be argued that Thailand's interpretation of the creative economy aligns with the conceptual framework of the SDGs, potentially leading the country to achieve 10 specific goals. Although this differs slightly from global assessments, these goals cover all dimensions of development necessary for national sustainability. Despite local variations, the model incorporates core mechanisms for effective creative solutions: the generation and exploitation of intellectual property, value-adding processes, and the establishment of strong environments and networks.

**Thailand's creative economy and Thailand's sustainable development:** The interpretation of the creative economy in Thailand serves as a creative solution and a new growth engine for national development, as evidenced by the SDG assessment. This concept has the potential to achieve 10 sustainable development goals, spanning socio-economic, human, and other development approaches. Thailand's creative economy stands out in its attempt to sustain economic growth, human resources, and strong institutions through the three mechanisms mentioned previously. It aims to foster sustainable consumption and production driven by creativity and culture, which state authorities consider essential capital for developing human well-being. Thus, it can be concluded that the creative economy is an effective strategy for national and sustainable development according to the SDGs. This effectiveness is presented through merchandising, economic growth, reputation, and increased investment and collaboration within the creative sectors.

Even though the concept of Thailand's creative economy aligns with several SDGs, this does not automatically imply that the country will achieve overall sustainable development, as seen in the contradictions regarding Thailand's actual progress. While the creative economy concept contributes to 10 SDGs, the nation as a whole has only achieved 4 goals according to the Voluntary National Review (VNR). Although Thailand ranks first among ASEAN countries for driving sustainable development, the nation remains an upper-middle-income country

An unexpected outcome of this research is that the growth of Thailand's creative economy is not yet strong enough to stimulate the country's overall sustainable development. This issue may arise from the limitations of the national environment – such as administration and capability – rather than the potential of the creative economy itself. The creative economy is the result of a shift in national strategy that tends to foster downstream activities. However, Thailand suffers from inherently weak downstream activities, as the model was developed through top-down policies and state-designed economic activities.

Consequently, the image of Thailand's creative economy might not truly emerge from the bottom-up participation of individuals and communities, which impacts its effectiveness. Furthermore, policy effectiveness may be assessed primarily on paper rather than through actual circumstances in Thailand. This research demonstrates that the assessment of national strategy cannot be fully fulfilled without considering real-world implementation. Therefore, the shift in national strategy may fail to provide an effective solution as long as the missing steps are concealed beneath effective policies on paper that do not yield positive results in reality

The creative economy has been used worldwide as a new growth engine, turning some nations into creative powerhouses. In Thailand, the creative economy has developed in recent decades as part of a shift toward the global arena and national development strategy. Thus, while the concept of Thailand's creative economy is an effective strategy according to the SDGs, it does not represent the country's full progress toward sustainable development when policy assessments contradict reality. This analysis identifies a potential new growth engine but does not present Thailand's general progress toward all sustainable development goals. Nevertheless, the sector developed significantly during the COVID-19 pandemic, as many businesses successfully utilized creativity to tackle financial stagnation and stimulate economic activity.

## 5. DISCUSSION

Based on the interpretation of Thailand's creative economy, the conceptual framework indicates that the country possesses the potential to reach 10 out of the 17 Sustainable Development Goals (SDGs) through five primary strategies implemented by the Creative Economy Agency (CEA). The initial hypothesis was that adopting the creative economy as a new growth engine would serve as an effective solution to stimulate overall sustainable development, mirroring successful global models. However, this expectation is falsified by actual national progress; while the theoretical concept contributes to 10 SDGs, the Voluntary National Review (VNR) reveals that Thailand has only successfully achieved 4 goals.

While previous global findings and international organizations (e.g., UNCTAD, UNESCO) present the creative economy as a definitive driving force for robust sustainable development, this research confronts those assumptions by revealing a contradicting

outcome. The growth of Thailand's creative economy is not yet strong enough to stimulate the country's overall sustainable development. The theoretical significance of these results demonstrates that policy effectiveness is frequently assessed primarily on paper rather than through actual socio-economic circumstances. This study proves that the assessment of a national strategy cannot be fully fulfilled without considering real-world implementation, as a conceptual shift in policy fails to provide an effective solution if the missing practical steps are concealed beneath well-drafted policies that do not yield positive results in reality.

The broader implications of these findings suggest that the discrepancy between policy expectations and actual outcomes stems from the limitations of the national environment rather than the potential of the creative economy itself. Thailand suffers from inherently weak downstream activities, as the economic model was developed through top-down policies and state-designed economic activities. Consequently, the true image of Thailand's creative economy does not emerge from the bottom-up participation of individuals and communities, which severely impacts its overall effectiveness and explains why the country remains trapped as an upper-middle-income nation despite possessing abundant creative resources.

Regarding the limitations of this study, data collection constraints impacted the analysis, primarily concerning the lack of official governmental documents explicitly linking creative economy plans to sustainable development metrics in some countries. Furthermore, there were significant global changes in the definition and classification of the creative economy, especially during the COVID-19 pandemic, which impacted the stability of information and structural boundaries of the creative sectors analyzed.

As a direction for future research, further study of Thailand's current national circumstances, bureaucratic structures, and other overlapping socio-economic policies is necessary. Future policy approaches must assess national circumstances alongside policy evaluations to determine the practical feasibility of effective implementation, as the assessment of a single policy cannot fully capture or change the entire nation given the variety of existing domestic challenges. Researchers should focus on how top-down development strategies can be practically transformed into bottom-up community participation to ensure that the theoretical potential of the creative economy translates into effective sustainable development in reality.

## 6. CONCLUSIONS

As sustainable development goals must be delivered to all people, state authorities serve as crucial mediators to provide effective development and ensure the improvement of human well-being with greater equality. The creative economy is addressed as a creative solution to tackle challenges in various countries and is believed to lead toward sustainable development. Simultaneously, its feasibility as an option applicable to many areas makes defining and assessing the creative economy an ambiguous task. This research illustrated the application of the creative economy in four countries to examine how it is interpreted within their respective economies. It not only presents the diverse global uses of the creative economy but also reveals the shared characteristics used worldwide. Moreover, the significance of the creative economy is shown through unique interpretations shaped by both the global creative economy and specific local contexts. This four-country study allowed for the conceptualization of core concepts and mechanisms used to critique Thailand as a case study.

In Thailand, the creative economy is part of a shifted national development strategy that focuses on cultural and creative capital derived from human intellectual property, promoting a value-based economy under “Thailand 4.0” and the “New S-curve” to drive national development. The interpretation of Thailand’s creative economy is shaped by a combination of shared global characteristics and the specific needs of the Thai economy. This is reflected in the significance assigned to the creative economy by state authorities in terms of its definition, classification of sectors, and operational mechanisms.

The creative economy originates from non-economic capital, such as human capital and intellectual property – including culture and creativity – which is used to generate more revenue than traditional industries through a value-adding process. Each country possesses different resources and processes to add value to this non-economic capital. Thailand utilizes creativity and culture to increase revenue through Thai-branded goods and services. This approach is relevant to the U.S., which leverages cultural diversity; the U.K., which uses these capitals for national branding to stimulate economic activity and human development; Japan, which utilizes cultural beauty to strengthen soft power; and South Korea, which exports creative content across platforms to attract overseas consumers and increase domestic demand. Furthermore, all studied countries mention a system to reproduce the creative economy, beginning with efforts to strengthen human capability through education or skill training. They also focus on building creative-driven environments and strong networks to promote the most effective version of the creative economy in their respective countries.

The creative economy serves as a solution driving multiple approaches to national development, covering all pillars of sustainable development. Thus, it is recognized as a potential tool for global sustainable development, as highlighted by the International Year of Creative Economy in 2021. However, due to its diverse global applications, it is necessary to critique specific case studies to evaluate actual effectiveness. The effectiveness of Thailand’s creative economy was assessed using the Sustainable Development Goals (SDGs), and the results indicate it has the potential to drive 10 out of 17 goals, compared to the 9 goals identified in global models. This analysis suggests that Thailand’s creative economy is theoretically effective enough to progress toward sustainable development. Conversely, Thailand has not yet made aggressive progress in achieving these sustainable development goals in reality.

The discrepancy between policy effectiveness and the actual capability of national authorities explains why a country may fail to make progress toward sustainable development. Consequently, this research presents two recommendations:

- Critique policy effectiveness by comparing development plans or policy papers with actual outcomes to present the most accurate level of effectiveness, rather than relying solely on the SDGs or other assessment tools. This approach helps identify elements requiring correction, which only becomes apparent when policy analysis is consistent with reality.
- Assess national circumstances alongside policy evaluations to determine the feasibility of effective implementation, as some policies may fail to have a positive impact due to national limitations or changing circumstances that no longer suit the strategy.

This can be observed in the shifting of national strategies over time or across different locations and situations. While the creative economy is a potential tool for sustainable development, it is not currently effective enough to lead the entire country to its goals.

Therefore, further study of Thailand's current circumstances and other related policies is necessary, as the assessment of a single policy cannot fully capture or change the entire nation given the variety of existing policies and domestic challenges.

The author has read and agreed to the published version of the manuscript.

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Tebogo LEKOTA<sup>1</sup>Oluwatoyin Ayodele AJANI<sup>2</sup>

## ARTIFICIAL INTELLIGENCE AND THE FUTURE OF HIGHER EDUCATION: PROSPECTS, CHALLENGES, AND QUALITY ENHANCEMENT STRATEGIES

This study reviews literature on the impact of artificial intelligence (AI), in relation to the quality of higher education. The synthesis of evidence across disciplines has enabled this study to examine whether AI enhances learning outcomes or poses a risk to academic standards. Literature found demonstrates that there are many potential advantages of using AI, including personalised learning, adaptive instruction, increased support for teachers, and efficient administration. In addition, the literature highlights potential challenges associated with the use of AI in higher education, such as data privacy, algorithmic bias, unequal access to technology, and the need for educator training in AI use. Therefore, understanding both the potential advantages and disadvantages of using AI in higher education will enable institutions to develop appropriate policies and procedures for managing AI in their respective contexts.

**Keywords:** higher education, artificial intelligence, educational quality, teaching and learning, student outcomes, student engagement.

### 1. INTRODUCTION

Artificial Intelligence (AI) is one of the most important emerging technologies, attracting significant interest and discussion in higher education (Alghamdi, 2022). The proponents believe that incorporating AI-based systems could change the way higher education is delivered, offering personalised learning experiences, automating administrative tasks, and improving the efficiency of instruction delivery (Deng et al., 2022). On the other hand, many people are concerned about potential trade-offs between efficiency and educational quality.

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<sup>1</sup> Tebogo Lekota, University of Limpopo, South Africa; e-mail: tebogo.lekota@ul.ac.za. ORCID: 0009-0003-4817-734X.

<sup>2</sup> Oluwatoyin Ayodele Ajani, University of KwaZulu-Natal, Durban, South Africa; e-mail: AjaniO@ukzn.ac.za (corresponding author). ORCID: 0000-0001-6545-0203.

Therefore, the purpose of this study was to provide an overview of current research on AI integration in higher education to determine whether AI contributes positively or negatively to the quality of higher education. Thus, the objective of the study is to elucidate the complex interrelationship between AI and educational quality in higher education.

As researchers note, AI is driving a large-scale transformation in academia. As Kharbat et al. (2020) state, in the era of AI, higher education will see diversity in academic roles, enhanced teaching methods, personalised learning options, new types of assessment, and a much more open educational environment.

Furthermore, researchers agree that higher education is currently at a critical crossroads, requiring significant transformation (Zhang, 2023). With new technologies, including AI, we are seeing opportunities to automate aspects of instruction and routine tasks (Popenici, Kerr, 2017), thereby transforming the way students learn and how universities operate.

There are examples of early uses of AI during crisis situations, such as the COVID-19 pandemic, demonstrating AI's ability to enable continuous learning and increase accessibility via online platforms (Zawacki-Richter et al., 2019). These examples of using AI in education introduce both new opportunities and new challenges for teaching and learning in higher education. Advancements in AI can alter the operational structure and organisational culture of the university, and the introduction of adaptive learning technologies is becoming increasingly important to improving student outcomes (Singh & Hiran, 2022). At the same time, researchers note that there is widespread misperception and fear regarding AI's capabilities, which require a reconsideration of traditional concepts of expertise and pedagogical practices (Bearman et al., 2022).

Even though AI is a rapidly emerging technology capable of performing tasks that emulate human intelligence (Bearman et al., 2022), its use in academia has occurred gradually. Global predictions made in 2019 suggested that AI would become mainstream in higher education in just a few years (Zawacki-Richter et al., 2019). Research indicates that AI-based applications in higher education are already producing positive results in several pilot projects (Lucena et al., 2019).

For example, Alghamdi (2022) states that in Saudi Arabia, AI is viewed as a mechanism for achieving educational objectives consistent with national development goals, even though increased awareness and capacity among faculty members to utilise AI tools are still needed. In general, educators' lack of knowledge of AI's functionality and benefits has been recognised as a barrier to the successful implementation of AI (Zawacki-Richter et al., 2019).

Some case studies recommend addressing such knowledge deficits by training academic personnel in AI pedagogy, providing technical assistance, and incentivising experimentation with AI in the classroom, and by promoting research on AI-based educational applications (Bozkurt et al., 2021). Such knowledge deficits must be addressed if higher education institutions hope to realise the full potential of AI.

Researchers are also examining how the next generation of AI techniques may profoundly enhance the quality of both teaching and learning. The rapid acceleration of the incorporation of contemporary AI technologies in higher education over the past several years (Deng et al., 2022) has generated recommendations for universities to update their teaching models, for example, by combining traditional forms of instruction with online and AI-based formats to produce more flexible and innovative learning environments (Ouyang et al., 2022).

AI has already significantly impacted many areas of daily life, for example, intelligent assistants, robots, and advanced data processing, and it is likely to continue influencing the management of education by making it more forward-thinking, data-driven, and transparent (Yu, 2021). Given current trends, this review examined the emergence of AI in higher education, specifically its impact on educational quality. More specifically, the review is directed by the following research questions:

1. What problems arise from integrating AI into the higher education system?
2. How does AI contribute to the enhancement of educational quality in higher education institutions?
3. What dangers or concerns does AI pose to the quality of education in higher education?

## **2. LITERATURE REVIEW**

### **Growth of Artificial Intelligence (AI) in Higher Education**

As AI continues to expand into the educational arena, it has become one of the fastest-growing areas of research in contemporary educational studies. Since the advent of digital technologies over the last decade, with the increased volume of data-driven learning environments and the rising demand globally for innovative solutions in education, there has been an unprecedented rate of growth in the amount of published research in this area. For example, bibliometrics show exponential growth in the number of articles on AI in HE since 2020, with particularly steep growth between 2021–2022. The reason for this is the increasing availability of technologies and the pressing need for educators to rethink teaching and learning in a world where technology mediates almost all educational encounters.

Scholars see the tremendous growth in AI research in HE as a sign of new pedagogies being created and supported by machine learning, natural language processing, and learning analytics. Scholars are increasingly recognising that AI is no longer just a tool to augment traditional teaching and learning but a way to transform how we teach and learn. Therefore, scholars are exploring the possibilities and complexities of AI use in HE institutions worldwide.

### **Pedagogy and AI: Diversifying Teacher Roles and Innovating Curriculum Design**

The literature suggests that one of the main themes in the literature is the diversification of educators' professional roles and the restructuring of curriculum design using AI technologies. Much of the literature indicates that AI technologies used in education include adaptive learning systems, intelligent recommendations and personalised feedback systems. These systems provide students with learning experiences that are tailored to their individual needs and abilities. Adaptive learning systems enable students to work at their own pace, receive customised support to meet their learning goals, and navigate learning paths designed to fit their individual learning styles and discipline-specific requirements. This shift to personalised learning has major implications for teachers. Teachers are now required to act as facilitators of learning and guide students through complex digital learning environments, and help students develop the skills necessary for self-directed learning. Learning analytics derived from AI provide teachers with real-time data on student performance, enabling them to intervene at the right time and develop curricula that are more relevant to their students' learning needs. This creates a more open, flexible environment in which students and technology collaborate to generate learning.

### **AI, Automation and Intelligent Support Systems**

In addition to changing the nature of instruction, AI has also been used to automate routine administrative and academic support functions. For example, AI systems are being implemented to manage processes such as registration, scheduling, automated grading support and automated responses to students who ask common questions. AI reduces the administrative burdens teachers face, freeing them to focus on mentorship, collaborative learning, and scholarly pursuits. Intelligent tutoring systems are another type of AI innovation discussed in the literature. These systems provide students with instructional content tailored to their specific needs, scaffolded learning activities that help them master new concepts, and continuous, formative feedback. Results from several studies indicate that intelligent tutoring systems can improve student engagement, conceptual understanding, and abstract thinking. Given the current trend of expanding enrollment and decreasing funding in many HE institutions, the scalability of AI to provide universal academic support is particularly important.

### **Institutional Change and the Data-Driven University**

A growing body of literature indicates that the adoption of AI is profoundly affecting the structure of HE institutions. Increasingly, institutions are using predictive analytics to inform student retention, program development and resource allocation decisions. Using data generated from digital learning environments, institutions can analyse students' behaviour, predict when students are at risk of academic failure, and provide targeted support to those at risk. The increasing reliance on data to decide which programs to develop and how to allocate resources is indicative of a paradigm shift in the management of HE institutions.

HE institutions are increasingly being viewed as organisations whose success is measured by the effective use of data to achieve organisational objectives. Thus, AI is operating at multiple levels in HE institutions, transforming classroom practices, administrative processes and institutional strategies. The level of systemic integration that AI is achieving in HE institutions necessitates the development of comprehensive frameworks that capture the multiplicity of effects that technological innovation is having on educational outcomes.

### **Challenges of Faculty Preparation and Continuing Education**

Despite the transformative potential of AI in education, the literature demonstrates several challenges in preparing and continuing to educate faculty members to effectively implement AI in the classroom. Many faculty members report feeling uncertain about how to effectively integrate AI tools into their teaching practices. To successfully implement AI in their classrooms, faculty members often require the development of new technical competencies, new forms of assessments, and new methods of evaluating the validity of insights generated by algorithms.

Professional development initiatives have been identified as a key component to the successful adoption of AI. Absent the provision of ongoing support for professional development, faculty members may feel uncomfortable or resistant to technological innovation. Additionally, the level of digital literacy varies widely across disciplines and institutions. Therefore, the successful integration of AI is directly correlated to the development of digital pedagogical expertise in HE professionals.

### **Ethical Challenges and Responsible Implementation**

Ethical issues are a second major theme in the literature examining the use of AI in HE. The large-scale collection and analysis of student data has raised serious concerns about students' rights, particularly regarding privacy, informed consent, and the regulation of educational information systems. Furthermore, the use of algorithms to make decisions about student learning can inadvertently replicate social biases stemming from the lack of diversity in training data sets and/or the lack of transparency in the decision-making process. Researchers emphasise the importance of creating ethical protections that guarantee AI enhances, rather than diminishes, educational equity. Creating responsible implementations of AI will require transparent regulatory frameworks, participatory design processes, and continual assessment of AI's impact on various student groups. The ethical alignment with educational values will determine whether AI is seen as legitimate and beneficial by stakeholders.

### **Disparities in the Adoption of AI Globally**

In addition to illustrating disparities in AI adoption across different types of institutions and country contexts, the literature indicates inequitable access to AI globally. Highly resourced universities in technologically advanced countries are often able to develop and deploy advanced digital systems, while institutions with limited resources in less technologically advanced countries face severe impediments to participating in AI-driven innovation.

The potential for AI to exacerbate existing inequities in educational access and quality is a major concern. Reviews of global research on AI in HE indicate that it is predominantly conducted in a few highly developed countries, and therefore, perspectives from less developed countries are under-represented. These disparities underscore the need for context-sensitive strategies that address the structural impediments to accessing AI and promote equitable technological development. If these structural impediments are not addressed, AI may exacerbate rather than mitigate existing inequities in HE globally.

### **Technology Acceptance Model as a Framework for Understanding Stakeholder Response to AI**

One way to understand how stakeholders respond to AI-related innovations is through the Technology Acceptance Model (TAM). TAM posits that people's acceptance of new technologies is determined primarily by two factors: perceptions of usefulness and ease of use. In the context of HE, these constructs can provide insight into how educators and learners assess the potential benefits and practical challenges of using AI-based tools in teaching and learning.

When educators view AI-based tools as potentially improving student engagement, streamlining the assessment process, or enhancing the personalisation of instruction, they are more likely to begin integrating such tools into their pedagogical practice. On the other hand, when educators perceive AI-based tools as too complicated, unreliable, or incompatible with their discipline-specific teaching norms, they are likely to resist adopting them. A number of studies have demonstrated that many educators have expressed scepticism about the pedagogical value of AI-based tools, highlighting the need for additional empirical research and targeted awareness initiatives.

### **Extensions of TAM**

Research in recent years has extended TAM to include additional factors relevant to understanding technology adoption in organisational settings. Examples of extensions to TAM include the Unified Theory of Acceptance and Use of Technology (UTAUT), which incorporates four antecedents of behavioural intention: performance expectancy, effort expectancy, social influence, and facilitating conditions.

UTAUT has been applied to research on the adoption of AI-based tools in HE and has provided a more comprehensive explanation of the factors influencing educators' intentions to adopt them. Other research has suggested that perceptions of the ethics of AI-based tools and the transparency of their decision-making processes are additional dimensions that influence educators' decisions to adopt them.

### **Factors Influencing User-Friendly Design and Ease of Integration into Teaching Workflows**

The literature reviewed suggests that factors such as user-friendly design and ease of integration into existing teaching workflows are critical to educators' acceptance of AI-based tools in their teaching practices. When AI-based tools are easy to use and aligned with educators' professional values, educators are more likely to view AI-based tools as both useful and manageable. In this sense, acceptance of AI-based tools is a holistic judgment that encompasses educators' perceptions of the pedagogical effectiveness of the tool, its ethical legitimacy, and the institutional support available to use it.

### **Implications for Educational Quality**

The literature reviewed suggests that the impact of AI on educational quality results from a complex interaction among technological capabilities, human competencies, and institutional conditions. AI has the potential to personalise learning experiences, automate routine administrative and academic support functions and provide educators with data-driven insights. However, the realisation of this potential depends on educators adopting new technologies, creating ethical governance frameworks, and ensuring equitable access.

Conversely, the successful integration of AI in HE requires a balanced approach that recognises both its opportunities and limitations. By situating stakeholder perceptions of AI as the central construct in the Technology Acceptance Model, researchers and practitioners can better understand how technological innovations translate into meaningful educational transformation.

## **3. METHODOLOGY**

This review has been conducted systematically and in accordance with established best practice for literature reviews. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) protocol has been used to guide the search and selection process for this review (Moher et al., 2015; Page et al., 2021). The search strategy used to locate relevant literature for this review included an extensive search of major academic databases and online repositories. The search included ERIC, IEEE Xplore, Scopus, and Web of Science.

A wide range of keywords and terms has been used to find relevant literature. Some examples of keywords and terms used include "Artificial Intelligence", "Higher Education", "Educational Quality", "Teaching and Learning", and "Student Outcomes". In addition to keywords, a temporal search was used. The search strategy included the earliest

literature on the development of artificial intelligence (AI) in education and the latest studies available at the time of this review. This allowed both foundational research and contemporary research to be reviewed. An iterative search strategy was employed. Initial broad searches were followed by more targeted queries, reference chaining, and citation tracking to ensure that no important studies were missed.

Peer-reviewed journal articles, conference proceedings and scholarly reports have been included in the review. These documents were required to be peer-reviewed and focus on the potential of AI to affect the quality of higher education. Quality of education has been defined broadly to include factors such as student learning outcomes, teacher effectiveness, student engagement, and institutional efficiency and innovation in teaching and learning. The review has placed particular emphasis on studies published since 2016 in order to reflect the rapid growth of AI applications.

However, seminal studies on AI in higher education published before 2016 have also been considered if they provide important insights. Empirical studies (quantitative, qualitative, or mixed-methods) and comprehensive literature reviews have been included in the review provided that they offer insights into the potential or limitations of AI in a higher education context. Studies that focused on AI in primary or secondary education were excluded from the review unless the results were directly translatable to the higher education sector. Finally, only studies written in English and available in full text have been reviewed.

### **Screening and Selection**

In accordance with PRISMA guidelines (Moher et al., 2015), the literature screening for relevance to the review's research questions was conducted in several stages. Initially, all retrieved records were screened based on title and abstract to exclude obviously irrelevant studies (e.g., those that deal exclusively with AI in the industrial sector or in completely unrelated areas). The next stage in the screening process involved evaluating potentially relevant studies based on their full texts. During this evaluation, each study was assessed to determine whether it met the review's inclusion criteria.

Disagreements regarding the relevance of studies were resolved via discussion among the researchers. When possible, multiple reviewers cross-checked the decision to include studies to reduce bias and variability in determining which studies to include (Belur et al., 2021). Finally, after screening the retrieved literature, a subset of studies that met the inclusion criteria was selected to serve as the basis for the review.

Structured forms have been used to extract key information from each study included in the review. Data that was extracted from each study included the study's location (country, institution), the specific AI technologies used (predictive analytics, intelligent tutoring systems, automated grading), the methodological approach used by the researcher(s), and the researcher(s) significant findings regarding the effect of AI on educational quality. In addition to extracting information on the potential benefits (efficiencies, improvements, positive student outcomes) of AI, the reviewer(s) also documented the challenges or risks associated with its use.

A thematic analysis technique has been used to analyse the extracted data to identify recurring themes and trends across studies (Saldaña, 2021). Themes were organised around the research questions. A priori coding (based on the research questions and the TAM framework) and grounded coding (emergent coding) have been used to identify both anticipated and unanticipated insights into AI's effects on higher education.

Additional steps were taken to ensure that the synthesised findings of this review are reliable and of high quality. For studies that permitted it, the quality of individual studies was assessed (e.g., sample sizes in empirical studies or the robustness of methodologies in literature reviews). The PRISMA 2020 checklist (Page et al., 2021) was referenced to verify that all essential elements of a rigorous review were reported, from the search strategy to the reporting of findings. The application of these systematic methods will enable the reviewer(s) to draw informed conclusions regarding AI's role in higher education.

#### 4. RESULTS

This section synthesises and interprets the research findings organised by the three main themes of this systematic review: challenges in implementing artificial intelligence (AI) into higher education, the benefits of AI in increasing the quality of education, and the risks and concerns regarding AI in higher education.

##### 1. Challenges in Implementing Artificial Intelligence in Higher Education

According to the literature, several barriers impede the effective implementation of AI in higher education. The primary barrier is ethical and privacy considerations. For instance, all AI systems collect vast amounts of student data, including their personal and academic history. It is the duty of institutions to protect this data and ensure that algorithms used in the systems do not unfairly discriminate against certain groups. Without mechanisms of transparency and accountability, AI systems can unintentionally reinforce pre-existing inequalities and erode trust in education systems (Chaka, 2023; Zawacki-Richter et al., 2019).

Another barrier to successful AI integration is a significant shortage of adequate faculty training and a distrustful attitude towards adopting AI in the classroom. Many academics lack the necessary digital literacy to apply AI in pedagogy, and the fear of being replaced by machines has led to significant resistance (Popenici, Kerr, 2017; Deng et al., 2022). Both of these barriers can be addressed through robust faculty professional development programs and inclusive policies that position AI as a pedagogical partner rather than a replacement for educators.

A final barrier to the use of AI is the technological infrastructure of institutions. There is significant variability in the technological capabilities of different institutions. Institutions located in developing regions often lack reliable internet connections and/or the necessary hardware to run AI systems effectively (Garidzirai, Garidzirai, 2021). Finally, the barriers to AI integration created by equity and access issues compound this problem. Students from lower socio-economic backgrounds often lack equal access to the digital technologies that enable AI-supported learning experiences (Mospan et al., 2022; Garidzirai, Garidzirai, 2021).

Pedagogical alignment is another challenge. Most AI-based solutions were not developed with specific curricula in mind. Therefore, the pedagogical content of the solution does not align well with the institution's educational requirements (Bearman et al., 2022). There is very little empirical evidence related to the effectiveness of AI-based interventions over time. In fact, few high-quality studies examine the extent to which AI-based interventions improve student outcomes and the overall quality of institutions (Ouatik et al., 2021).

Finally, local contextual factors greatly influence how institutions implement AI. The extent to which institutions embrace change, their organisational philosophy, and the

cultural norms of their region all influence how AI is perceived and utilised (Salas-Pilco, Yang, 2022). To overcome the challenges presented by the previous discussion and ensure that AI contributes to improving the quality of higher education, institutions must develop a coordinated strategy that balances ethics, infrastructure, training, and inclusiveness.

## 2. Contributions of Artificial Intelligence to Educational Quality

While the previous section identified numerous challenges to the effective use of AI in higher education, the literature also provides substantial evidence that AI can significantly enhance educational quality. One of the most significant ways in which AI improves educational quality is through personalisation. AI-driven adaptive learning platforms enable instruction tailored to each student's unique needs. As a result, student engagement, motivation, and deepened learning are increased (Bozkurt et al., 2021; Chu et al., 2022).

Intelligent tutoring systems provide real-time, personalised feedback and support to students. These systems allow students to learn at their own pace and increase completion rates in large or diverse classes. AI-based learning materials reduce cognitive overload and improve conceptual knowledge in the sciences. For example, Koç-Januchta et al. (2022) demonstrated the potential of AI to support complex, discipline-specific learning.

AI enhances the assessment and feedback process by automatically providing formative evaluations and generating detailed, immediate feedback on student assignments. This frees up instructional time for instructors to focus on providing higher-order feedback that encourages critical thinking (Rutner, Scott, 2022; Chen et al., 2020). Furthermore, AI analytics help instructors identify trends and misconceptions in student performance. By using these insights, instructors can adjust their teaching strategies to better meet students' needs.

Another important contribution made by AI is to facilitate greater inclusion. Technologies such as speech-to-text recognition, real-time captioning, and text-to-speech conversion enable students with disabilities and multilingual students to participate fully in the learning experience (Kharbat et al., 2020). Additionally, AI-based solutions streamline administrative tasks through chatbots, predictive analytics, and enrollment management systems. These solutions provide enhanced student services and optimise resource utilisation. Together, these AI-based applications contribute to the quality, inclusiveness, and effectiveness of institutions.

## 3. Risks and Concerns About AI's Effects on Educational Quality

The literature also identifies the risks and concerns associated with AI in higher education. First and foremost are the data privacy risks and cybersecurity threats posed by the massive amounts of student data collected by AI systems (Alghamdi, 2022). Data breaches compromise the trust and security of learning environments.

Algorithmic bias represents another concern. Algorithms can be biased based on the data they are trained on. If the data are incomplete or skewed, then the system may perpetuate systemic inequality or unfairly evaluate students (Chaka, 2023). Concerns also arise regarding diminished human interaction and decreased pedagogical relationships. Over-reliance on automated tutors and chatbots reduces opportunities for mentorship, empathy, and collaborative learning. Collaborative and empathetic learning is fundamental to developing critical and social skills. Questions of accountability also arise. When AI systems commit errors in grading or decision-making, who is accountable? Should it be the instructor or should it be the machine (Zawacki-Richter et al., 2019)?

Finally, AI raises concerns about the changing role of faculty members. Faculty members worry that AI will replace them in the academic process and diminish their authority. Educators believe that once AI assumes control over the majority of academic

processes, the value of faculty members will be lost (Deng et al., 2022; Hannan, Liu, 2021). Both students and instructors are susceptible to developing dependence on AI. Dependence on AI may lead to diminished ability to think independently and reflect critically.

## 5. DISCUSSION

The findings from this systematic review offer nuanced insight into the relationship between the adoption of Artificial Intelligence (AI) in Higher Education and educational quality. This was consistent with broader research indicating that although there is significant potential for transformative use of AI, successful integration depends on institutional readiness for AI, pedagogical alignment, and ethical governance structures. The persistent concerns around data privacy, algorithmic transparency and the infrastructural inequalities identified in this study, as well as the broader literature, suggest that technological innovation itself does not guarantee educational improvement (Zawacki-Richter et al., 2019; Selwyn, 2019).

Meaningful enhancement of educational quality will require a deliberately and critically informed approach to embedding AI into existing teaching and learning ecologies. As such, the findings further reinforce the argument made elsewhere that Universities must implement strategic responses to the technical implementation of AI, organisational culture, staff preparedness, and AI accessibility for students.

However, the review also supports the emerging consensus that, when implemented thoughtfully, AI-enabled pedagogies can enhance teaching and learning. AI-enabled personalised learning environments, intelligent tutoring systems and learning analytics have been shown to increase student engagement, improve conceptual understanding, and facilitate different learning pathways (Bozkurt et al., 2021; Holmes et al., 2022).

These developments are aligned with constructivist theories, which advocate learner-centred approaches and adaptive feedback mechanisms. Additionally, the capacity of AI systems to automatically perform routine assessment tasks creates opportunities for academics to devote their time to high-level pedagogical interactions such as mentoring, critical dialogue, and scholarly supervision (Chen et al., 2020). A reallocation of academic labour as described may lead to improved educational quality, particularly in massified HE systems, where large student cohorts can limit the amount of meaningful feedback and individualised support that can be provided. Nevertheless, the review highlights the requirement for rigorous empirical evidence assessing long-term learning outcomes rather than short-term efficiency gains.

While these advantages exist, this study's findings highlight several risks associated with over-reliance on AI technologies. Concerns about algorithmic bias, epistemological dependency, and the possible diminishment of human pedagogical relationships remain relevant. Other research has highlighted the risk that AI systems trained on incomplete or culturally skewed datasets may replicate structural inequalities or marginalise particular student groups (Williamson, Eynon, 2020; Chaka, 2023).

Further, the possibility that excessive reliance on automation could reduce opportunities for collaborative learning and reflective practice raises serious questions about the holistic nature of HE. These risks are exacerbated by the uncertainty surrounding accountability in AI-mediated decision-making, particularly in automated grading and predictive analytics (Popenici, Kerr, 2017). Therefore, the current study provides additional support for the continued provision of human oversight and hybrid pedagogical

models that balance technological innovation with relational and ethical aspects of teaching.

As a result, the discussion shows that the effect of AI on educational quality is neither exclusively positive nor intrinsically negative, but instead depends on AI governance, professional development, and access. Increasing the AI-literacy of both academics and students becomes a key priority in order for stakeholders to be able to critically engage with AI-generated outputs and responsibly embed these tools into disciplinary contexts (Gupta, Chen, 2022).

Institutional investment in infrastructure, inclusive policy frameworks, and continuous monitoring of AI systems will also be necessary to mitigate unintended consequences. Thus, the study contributes to the ongoing debate by recognising that AI should not replace academic expertise but rather serve as an augmentative tool that can support pedagogical innovation and institutional effectiveness through the implementation of strategically grounded and contextually sensitive approaches.

Therefore, universities wishing to utilise AI to enhance quality should develop a balanced approach that incorporates human agency, critical digital literacy, and social justice considerations with technological advancements.

### **Recommendations**

The conclusions of this research show that integrating Artificial Intelligence (AI) in Higher Education must be done strategically and pedagogically, and that institutions are encouraged to develop their own teaching innovations using AI to enable personalised and adaptive learning paths. This will allow intelligent tutoring systems and adaptive platforms to assess each learner's learning gaps and adapt instructional content in real time.

Consequently, it will improve learner motivation and progress. Furthermore, AI-enabled learning analytics will enable educators to obtain actionable insights into patterns of participation, performance, and conceptual difficulties. Using this information, they will be able to develop courses that are even more responsive and evidence-based. New uses of AI, such as AI-supported Virtual and Augmented Reality, will also increase opportunities for experiential learning, especially in fields where simulation, professional practice, or laboratory work are required.

If carefully tested and evaluated, these new approaches could lead to significant improvements in students' learning outcomes and provide valuable data for future curricular development. To maximise the pedagogical benefits of these technological developments, universities need to embed them within inclusive and feedback-oriented institutional cultures. AI-driven tools for formative assessments can provide instant, detailed feedback to promote self-regulation, reflection, and mastery learning.

At the same time, the insights provided by AI analytics can help optimise the curriculum by identifying issues with the material sequence, gaps in the subject matter covered, and predictors of student success. Access to these benefits needs to be equitable for all, especially for students who have disabilities and those who are non-English speaking. To achieve this objective, a collaborative effort across various departments within an institution (e.g., Academic Departments, Student Support Services, and Technology Units) is needed, ensuring that accessibility, fairness, and student welfare are always at the forefront of AI-related implementation strategies.

Finally, the effective and ethical implementation of AI in Higher Education depends on developing robust governance frameworks, establishing institutional accountability, and investing in the long-term development of academic capacities. Universities need to

develop clear policy guidelines that include provisions for protecting personal data, ensuring transparency in the algorithms used, and continuous monitoring of fairness to maintain trust in the AI-mediated educational process.

It is equally important to enhance AI literacy among both staff and students, because only when both groups understand how AI works, its limitations, and the ethical implications of using AI in education can they use it responsibly. As a result, universities can create opportunities for continued professional development (e.g., workshops, peer mentoring initiatives, awards for innovative teaching practices) for teachers, enabling them to use AI in ways that complement rather than replace good pedagogy.

## 6. CONCLUSIONS

To realise the full potential of Artificial Intelligence (AI) in Higher Education, institutions must address the complex challenges and opportunities it presents. While the reviewed literature suggests that the impact of AI will not be inherently positive or negative based on the readiness of the institution, ethical governance of the technology and the intent behind the use of the technology; however, when AI is implemented with intentionality it has the ability to positively affect student learning via the use of personalization, adaptive feedback, and intelligent tutoring systems which support students to learn at their own pace.

In addition, AI can reduce the burden of administrative and assessment tasks, allowing educators to engage in meaningful interaction with students, provide mentorship, and foster higher-order thinking. However, these possibilities also pose several risks, including algorithmic bias, threats to data privacy, and the potential degradation of the relational and reflective nature of education. Therefore, if AI is adopted without being critically evaluated, there exists the possibility that AI could further exacerbate inequalities, reduce the role of human judgment, and promote efficiency over holistic learning.

Therefore, realising the potential benefits of AI while mitigating the risks requires intentional, ethical, and human-centred implementation. Universities, educators, and policymakers must collaborate to create the necessary conditions for governing AI, protecting data, and providing sustained professional development that develops digital and ethical competency.

Furthermore, AI must be utilised to augment, not supplant, educators' expertise and abilities to foster creativity, empathy, and critical inquiry. Finally, continuous evaluation, transparency in decision-making, and an unyielding commitment to educational values will be necessary to ensure that AI supports the quality of higher education.

All authors have read and agreed to the published version of the manuscript.

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Robert Kosho NDIYUN<sup>1</sup>Ricky Munyaradzi MUKONZA<sup>2</sup>

## UNPACKING LEGAL BARRIERS: LOCAL GOVERNMENT AUTONOMY IN CAMEROON

Cameroon introduced decentralisation mechanisms in the 1990s, and in 2019, the Code of Regional and Local Authorities was promulgated to transfer greater powers and autonomy to local governments. This qualitative case study investigates the legal frameworks, institutional mechanisms, and fiscal responsibilities defined in the 2019 law to assess the extent of subnational government autonomy. Through the lens of decentralisation framework, this paper contends that some provisions within the 2019 law contain substantial restrictions, undermining the ability of regional and territorial authorities to practice meaningful self-governance. The results suggest that the law promotes the rhetoric of decentralisation, but retains central government control over significant areas of local policy-making, resource distribution, and managerial oversight. This paper settles that the current legal construction of subnational governance in Cameroon is inadequate to achieve the type of decentralised, inclusive system projected, pointing to the need for significant legal reforms to strengthen regional and local authorities.

**Keywords:** Cameroon, decentralisation, local government autonomy, central government control, self-governance.

### 1. INTRODUCTION

The contemporary world has witnessed a silent revolution in the public sector administration. This paradigm shift aims to transfer decision-making from the central to the local public service, closer to the administered (Smith, 2023). Decentralisation has widely been adopted to foster democratic governance, enhance public service delivery, and promote development at the local levels, especially in sub-Saharan Africa (Riedl, Dickovick 2010). In Cameroon, the decentralisation process is designed to strengthen decentralised governments, enhance service delivery and ease citizen engagement in governance. However, the effectiveness of this process in attaining the set goals is often

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<sup>1</sup> Robert Kosho Ndiyun, Tshwane University of Technology, Pretoria, South Africa; e-mail: ndiyun2@gmail.com (corresponding author). ORCID: 0000-0002-6435-0494.

<sup>2</sup> Ricky Munyaradzi Mukonza, Tshwane University of Technology, Pretoria, South Africa; e-mail: MukonzaRM@tut.ac.za. ORCID: 0000-0001-8121-1501.

hindered by legal barriers that restrict local government (LG) autonomy. This paper critically explores these constraints and their bearings for local governance in Cameroon. This study is significant as it aims to unveil the intricacies of Cameroon's decentralisation process. Despite the legal provisions enshrined in the country's constitution and other legislative instruments, decentralised governments continue encountering crucial barriers undermining their functional autonomy and effectiveness. Understanding these constraints is essential for decision-makers, subnational government authorities and other stakeholders working to enhance local governance and sustainable development.

Decentralisation is broadly defined as the devolution of power, authority and competencies from the central to the subnational level (Smith, 2023). It is the breaking of state power to LG units into political, administrative and financial perspectives (Morozov, 2016). In the Cameroon context, the 2019 law considers decentralisation as the fundamental driving force of democracy, progress and good governance at the subnational level, involving the transfer of special attributes and necessary resources to territorial authorities by the state. On the African continent, the move towards decentralisation by most states has been orchestrated by the structural adjustment programmes that aimed to reform the public administration in the 1980s, and the move by most states towards a more liberal and competitive politics (Song, Vevanje 2023).

Cameroon has a historical legacy of a centralised governance framework that has silenced subnational autonomy and policymaking (Fombad, 2019). The 1996 constitution and other decentralisation laws aimed to move decision-making to regional and local authorities (RLA), yet the application of these norms has been inconsistent and fraught with challenges. This leads us to interrogate the constraints undermining local governance autonomy in Cameroon, and how these challenges affect the country's decentralisation process. The overarching question is: How do legal frameworks on decentralisation and institutional practices undermine LG autonomy in Cameroon?

Despite the growing literature on decentralisation in Africa, a gap persists in understanding legal barriers undermining decentralised government autonomy. In Cameroon, previous studies on decentralisation have focused on the decentralisation process before the 2019 landmark Code on RLA (Cheka, 2007; Kofele-Kale, 2011); education in decentralisation (Mbelle Mekolle, 2018); the historical appraisal of decentralisation in Cameroon (Song & Vervanje, 2023); traditional monarchies and decentralisation (Demanou, 2018); the respective competences allocated to councils and regions (Ntsama, 2023); natural resources (Adama, 2020); and policy implementation by local governments (Yombi et al., 2019). These studies do not specifically address the legal constraints to decentralisation, especially those enshrined in the 2019 law. This paper fills the gap by critically analysing the normative frameworks of decentralisation and their actual implications for subnational governance autonomy in Cameroon.

Evidence from various scholarly sources in Cameroon highlights that while the decentralisation legal frameworks reflect significant strides in governance, their implementation has been undermined by financial constraints, restricted powers of local authorities and the lack of political will (Fombad, 2019). The Cameroonian context is marked by an intricate interplay of socio-cultural, economic and political factors that undermine the decentralisation process (Demanou, 2018). For instance, the existing traditional monarchies, poverty, and the enduring armed conflict in the English-speaking regions of Cameroon further exacerbate the decentralisation process and underscore the need for an exquisite insight into local governance dynamics (Ndiyun, Mukonza, 2025).

This study's objectives are triple: first to recognise and scrutinise the legal barriers undermining LG autonomy in Cameroon; second, to examine the implications of these challenges on effective decentralisation; and third, to make recommendations for improving decentralised governance autonomy within the current normative framework. Through these objectives, the research contributes empirical evidence and theoretical insights that can guide policy and practice, broadening the scholarly discourse on decentralisation.

The paper's discussion unfolds with a presentation of the decentralisation context in Cameroon. This is followed by a review of scholarly discourse on decentralisation and subnational government autonomy, establishing the theoretical basis. The paper then outlines the methodology employed and subsequently presents the findings on legal constraints of local governance autonomy in Cameroon. The next section critically analyses the impact of LG autonomy barriers. The following section offers recommendations, followed by concluding remarks.

## 2. BACKGROUND TO DECENTRALISATION IN CAMEROON

A gradual and uneven process has characterised Cameroon's path towards decentralisation, marked by an enduring culture of centralised governance. The country's colonial legacy, first under German rule from 1884 to 1914, and subsequently under French and British administration, laid the foundation for an extremely centralised state system (Konings, 1996). This colonial heritage fostered a governance model that, post-independence, heavily mirrored the French colonial apparatus of assimilation and central control. At independence, Cameroon implemented a unitary state model governed by a highly centralised presidential system, further concentrating power in the hands of the central government (Fombad, 2019).

The entrenched influence of colonial rule on post-independent African states was exemplified by the actions of Cameroon's first president, Ahmadou Ahidjo, who designed a strong central governance structure analogous to that of France (Takougang, 2019). This centralisation approach was strengthened by the abolition of multipartyism and the introduction of a one-party system under the Cameroon National Union (CNU) between 1966 and 1985 (Konings, 1996). Centralisation has been perpetuated by successive regimes, first Ahidjo who ruled from 1960 to 1982, and Paul Biya who has been in power since 1982 (Bertelsmann, 2024). These moves have been critiqued as distorting the historical identity of the two Cameroon – British and French Cameroons – that reunited after independence into a two-state federation from 1961 to 1972 (Fombad, 2019).

The pro-democracy protests and ghost town operations in the 1990s compelled the government to promulgate a new constitution in 1996, marking a crucial milestone towards decentralisation in Cameroon (Takougang, 2003). While the 1996 constitution aimed to transform the state into a decentralised unitary model (Article 1(2)), creating regions and councils as decentralised territorial entities with legal personality and administrative and financial autonomy (Cameroon Constitution 1996, Article 55), enforcement has been ineffective. This lack of genuine political will for decentralisation is evidenced by the national government's continued dominance in local governance, reducing decentralisation to a mere rhetorical commitment. The central government's interest in maintaining control over the LGs is pushed by the desire to maintain political stability and prevent dissent, particularly in regions with strong autonomy rule tendencies, such as the Anglophone regions (former British Southern Cameroons) (Bertelsmann, 2024).

The 1996 constitutional provisions were intended to be reinforced by the Law on Orientation of Decentralisation in 2004, which outlined the rules for devolving powers and resources to LGs (Law No. 2004/017 of 22 July 2004). However, this law did not confer substantial powers to LGs, but instead bolstered the central government's control over local governance. The 2004 law created two levels of LG – regions and councils (municipalities) – but the central government's strict oversight has hampered effective decentralisation (Fombad, 2019). In 2009 supplementary legal innovations were introduced to enhance the financial autonomy of LGs (Law No. 2009/019 of 15 December 2009), yet inadequate financial resources and enduring state regulation continued to undermine these strides (Song, Vevanje, 2023).

The 2019 Law on the General Code of Local and Regional Authorities (Law No. 2019/024 of 24 December 2019), adopted partly to address the Anglophone crisis, purportedly provides a more comprehensive framework for the organisation and functioning of regional and LGs in Cameroon. This law grants more administrative, political and financial autonomy to LGs (Ndiyun, Mukonza, 2025). Innovations include the establishment of regional councils and a clearer definition of shared powers between central and subnational governments (Song, Vevanje, 2023). However, despite these landmark autonomy provisions, the 2019 law remains a façade of decentralisation characterised by strong central government oversight and the snail-pace implementation (Ndiyun, Mukonza, 2025).

The implementation of decentralisation in Cameroon has witnessed enormous setbacks, albeit normative reforms. The ongoing debate on the degree of autonomy and policymaking authority devolved to subnational governments demonstrates the critical challenges to effective governance (Riedl, Dickovick, 2010). Studies highlight various elements obstructing LG autonomy in Cameroon, including limited fiscal devolution, enduring central control and a lack of institutional capacity at the subnational levels (Cheka, 2007; Song, Vevanje, 2023). Beyond the legal framework, barriers to decentralisation in Cameroon are deeply associated with economic disparities, political culture and administrative capacity. For instance, the Anglophone crisis highlights how historical grievances and regional inequalities and marginalisation can undermine decentralisation strides, especially when legal reforms fail to address prevalent issues of exclusion and marginalisation (Agwanda, Asal, 2021; Konings, Nyamnjoh, 2003). The link between these elements underscores that decentralisation is not simply a technical or administrative process, but a deeply political approach that should respond to structural inequalities and promote inclusive governance. Fanso (2017) suggests that the Anglophone crisis stems from the political, socioeconomic and linguistic marginalisation of Anglophones and their consideration as second-class Cameroonians. This emphasises that legal reforms alone are insufficient to achieve meaningful decentralisation and foster local autonomy, but rather a holistic approach that incorporates broader contextual features.

The historical context discloses the trajectory of centralised governance and the relics rooted in the French colonial administration. Tunio and Nabi (2021) note that local governance under colonial rule was significantly limited, with inadequate financial resources and decision-making power, in stark contrast to the British's Indirect Rule policy that delegated administration and empowered the local chiefs to administer the population. This deep-rooted culture of centralisation has persisted in post-independent Cameroon, leading to a solid unitary state system with heavy national government influence over local governance (Cheka, 2007).

This paper contributes to decentralisation scholarship by offering a nuanced analysis of the normative barriers to LG autonomy in Cameroon. Through theoretical insights from sequential decentralisation theory and empirical insights from secondary data, the analysis enhances the understanding of why decentralisation strategies often fail. This study does not only fill the gap in literature on Cameroon's specific political context, but also provides lessons for other post-colonial states struggling with similar governance challenges.

The research contributes to the broader discourse on decentralisation and LG autonomy in Africa by emphasising the importance of aligning normative and policy mechanisms with the goals of strengthening LGs. Furthermore, it presents practical implications for decision-makers and subnational government officials in Cameroon, as it informs them of the strategies to mitigate the constraints on LG autonomy and enhance the effectiveness of decentralisation reforms. Following the literature, this paper analyses the legal constraints to LG autonomy in Cameroon, providing the basis for discussions and policy recommendations.

### **3. LITERATURE REVIEW**

The degree of independence granted to subnational entities vis-a-vis the central government has remained a persistent and contentious issue in public administration and governance discourse. In recent decades, many states, particularly in Africa, have adopted decentralisation to address governance challenges and improve local growth (Rugeiyamu, Msendo, 2025). The implementation of this governance policy has attracted scholars investigating the appropriateness, the modes, and the challenges encountered. This section presents a synthesis of decentralisation, drawing on the conceptual framework, forms, strengths, and challenges of decentralisation, supported by empirical evidence, to situate the study in the broader scholarly discourse.

#### **Conceptual and theoretical frameworks**

Decentralisation has generally been perceived as a governance strategy involving the attribution of authority to subnational units – including administrative, political, and fiscal competencies – to achieve public service objectives (Smoke, 2015). Ogunnubi (2022) considers this policy to function within the range of a territorial and administrative hierarchy. Decentralisation aims to avoid centralisation and enhance public service efficiency by ensuring that RLA become accountable to their population, leading to a government that is more sensitive to the needs of local communities (Rugeiyamu, Msendo, 2025). Makara (2017) corroborates that genuine decentralisation entails the organised “dispersal of power in society in political, social as well as economic sense... sharing power and responsibility between several subnational authority units”. Faguet and Shami (2022) also support this position suggesting that when decentralisation disconnects from democratic participation, it fails to achieve the expected outcomes. This disconnect often intervenes when elites capture the process, or when it is implemented in disguise as pseudo-decentralisation or nominal autonomy granted to LGs, where LGs have authority to make decisions, but are constrained in their ability to exercise same due to legal and institutional factors (Faguet, Shami, 2022). This is opposed to an adequately framed and implemented decentralisation policy which has the potential to expand political representation, enhance accountability and redistribute public goods to the poor. These definitions highlight the redistribution of political and financial authority to regional and

LGs, permitting them to manage their affairs and adopt policies tailored to the specific needs and context of their constituents.

Several theories have been projected to categorise decentralisation, with scholars such as Faguet and Shami (2022) suggesting three main forms: devolution, deconcentration, and delegation. Devolution, as the most common form of decentralisation, involves the establishment and reinforcement of subnational entities that enjoy some degree of constitutional autonomy (Fombad, 2019; Ogunnubi, 2022). This strategy involves the extensive transfer of political, legal and fiscal competencies and power from the national authority to regional and/or local entities, with autonomy in decision-making and no interference by the central government, a definition adopted by this study (Rugeiyamu, Msendo, 2025). Under this form of decentralisation, a comparatively higher degree of competencies and authority are transferred to the subnational governments than the other forms.

The second form of decentralisation, deconcentration entails the transfer of administrative prerogatives to lower units of the state within the same administrative setup (Reddy, Govender, 2013). Under this form of governance, the central state maintains total control while overseeing governance efficiency at its periphery (Mukhlis et al., 2025). The *raison d'être* of deconcentration is to decongest the national government, with the established units acting as the representatives of the national government under strict subordination (Okorie et al., 2023; Ogunnubi, 2022). The third form of decentralisation, delegation is implemented through the transfer of administrative competencies to semi-autonomous entities that are neither within the organisational structure of the central government nor controlled by it (Smith, 2023).

In his sequential theory of decentralisation (STD), Falleti (2005) suggests that decentralisation can be examined through three distinct yet interrelated dimensions: fiscal, political and administrative. Dickovick (2014) further expounds that the specific sequence in which these tenets are decentralised significantly determines the degree of autonomy granted to LGs. The STD encompasses three core principles: it frames decentralisation as a dynamic process; it considers the territorial interests of various bargaining stakeholders; and it integrates the effects of policy feedback into the analysis of these bargaining contexts (Falleti, 2005). The theory emphasises the negotiations that occur between key actors in decentralisation, including presidents, governors and mayors (Nyikadzino, Vyas-Doorgapersad, 2022). It highlights that central and local government officials often harbour divergent and sometimes conflicting territorial interests. These complexities provide valuable insights for analysing decentralisation innovations in Cameroon, particularly in elucidating the legal and institutional mechanisms that reinforce the central government's authority over local governance.

Moreover, the theory underscores a hierarchical preference among central governments for administrative decentralisation over fiscal decentralisation, which in turn is favoured over political decentralisation (Falleti, 2004). This hierarchy contributes to the weakening of LGs and fosters a scenario of unfunded decentralisation, wherein central authorities delegate responsibilities without ensuring the requisite financial support. This theoretical insight is crucial for understanding the challenges LGs face in exercising autonomy and effectively serving their constituents in Cameroon.

### **The strengths of decentralisation**

Scholars have produced empirical studies highlighting the strengths and success stories of decentralisation particularly in Africa. One key success is increased citizen participation

in public governance, which has been achieved in states that have adopted policies and created institutions that enhance grassroots engagement in decision-making (Rugeiyamu, Msendo, 2025). For instance, the implementation of a bottom-up development planning strategy in Tanzania has facilitated effective citizen involvement in development efforts (Kessy, 2023). Some researchers highlight the potential of decentralisation to enhance local governance through improved representation, accountability, and responsiveness to local needs (Reddy, Govender, 2013). To them, local policymakers are well informed to understand and handle the specific difficulties of their constituencies (Dias-Cayeros et al., 2014)

Other scholars highlight the decentralisation's contribution to improved service delivery by tailoring public goods to local demands, and enhancing efficiency through localised policymaking (Zarychta et al., 2024). It is seen as a tool to empower subnational authorities to administer basic services such as education and health effectively to the population (Rugeiyamu, Msendo, 2025). Dick-Sagoie et al. (2021) corroborate this argument, citing enhanced health service accessibility in Lesotho as a direct outcome of decentralised policy. Some researchers also suggest that decentralisation reinforces democratic processes through empowerment and participation. For instance, Kwori (2022) contends that decentralisation fosters civic engagement and facilitates the active participation of communities in governance processes.

### **Challenges of decentralisation**

While success stories of decentralisation have been captured by many scholars, some researchers emphasise its challenges, including limited autonomy, centralised control and resource dependency. Notwithstanding the key goal of decentralisation to promote managerial autonomy at the subnational levels, some regional and local entities experience limited autonomy imposed by the central government (Croese et al., 2021). Kessy (2023) study of decentralisation in Tanzania reveals restricted financial and administrative independence which undermines effective governance at the local level. This highlights the lack of political will and resonates with Ricart-Huguet and Sellars (2023) who contend that effective decentralisation policy is dependent on the political resolve and other motives of elite central and subnational governments. While some politicians publicly express their commitment to advancing decentralisation, there is often the tendency for the central government to withdraw some of the prerogatives already transferred (Faguet, Shami, 2022). This tendency aligns with the hierarchies and preferences by central governments to decentralisation forms posited by Falleti (2004). Equally, political patronage in the national and subnational governments, like in Kenya, intrudes on bureaucratic order and functioning in most African states, undermining accountability, transparency and participation in decentralisation (Lubuulwa, 2021).

Moreover, some studies have focused on the persistence of centralised control within the decentralisation framework. To some scholars, national government political intrusion resulting from the unitary form of some African states weakens subnational governance. Mugavu and Mucunguzi (2024) demonstrate how central government interference has resulted in a pattern of recentralisation in Uganda, Tanzania and Zimbabwe. In Uganda, the decentralisation reforms have failed to enhance political inclusion due to central government dominance, "a top-down approach that prioritise national over local priorities", entrenched corruption and persistent local elite capture (Vargas Falla, 2025). The authors argue that LG autonomy has been undermined as local officials frequently prioritise their relationships with national leaders over the interests of their constituents.

This reflects a form of upward accountability where LGs are more accountable to the national government than their constituents, undermining the principles of democratic governance and participatory development. The same practice holds in Tanzania, where central government dominance creates a situation where local councils operate more as implementers of national policies than as autonomous decision-making entities (Lameck, 2023). This practice contradicts administrative decentralisation, in which LGs design local policies and priorities autonomously, and per national laws, to address local needs and interests (Lubuulwa 2021). Its long-term effect is a weakening of local legitimacy and a disconnection between the population and their elected representatives, which can exacerbate social tensions. Zimbabwe's history of governance has been characterised by a highly centralised system, which the Zimbabwe African National Union Patriotic Front (ZANU-PF) regime inherited and practised post-independence under the guise of decentralisation, seen as "centralisation and recentralisation through decentralisation/devolution", reinforcing central government control (Nyikadzino, Vyas-Doorgapersad, 2022).

In their analysis of Bolivia and Pakistan to illustrate how differing political contexts shape the outcomes of decentralisation reforms, Faguet and Shami (2022) argue that capacity constraints, coordination issues between various tiers of government and other political dynamics like the absence of accountability, corruption and conflict between different levels of government undermine the success of decentralisation policies. The authors further suggest that successful decentralisation requires a balance between empowering local authorities and maintaining effective oversight from central governments.

In the case of Morocco and Jordan, Vollmann et al. (2022) suggest that decentralisation reforms have been employed as a tool to reinforce existing power structures – authoritarian upgrading – control dissent and manage elite interests rather than address societal demands for democratisation. Morocco and Jordan reflect decentralisation processes that offer nominal autonomy to LGs, which is largely superficial, due to financial dependence, regulatory oversight and appointment powers of the central government. While decentralisation reforms in both countries exhibit legal constraints, elite capture is also visible in Jordan, where, through co-optation, traditional tribal clientelist structures have been reinforced by decentralisation, facilitating the regime's effective management of political contestations and political tutelage over local elected officials (Vollmann et al., 2022). Similarly, the Moroccan local governance is manipulated through the appointment of officials with strong ties to the central authority, diluting the influence of elected local authorities, and maintaining the political tools of co-optation and repression used since the pre-colonial era to tame opposition (Houdret, Harnisch, 2019).

In exploring decentralisation, researchers also identify resource dependency as one of its constraints. Subnational governments often rely significantly on the transfer of financial resources from the central government, which restricts their capacity to generate revenue independently (Ogunnubi, 2022). According to Rugeiyamu and Msendo (2025), LGs in Tanzania are only able to raise about 10% of their annual budgets, relying on the national government for the rest through transfers. This demonstrates the inability of subnational governments to self-fund their activities. Shair-Rosenfield (2024), while emphasising adequate intergovernmental coordination, argues that LGs in low- and middle-income countries struggle with resource allocation and coordination due to weak state capacities. Reddy and Govender (2013) also stress unfunded mandates – an inconsistency between

transferred powers and the resources distributed to local authorities – as a key factor undermining local governance and service delivery in South Africa.

Decentralisation is viewed as a structural solution to immediate political needs, introducing the concept of instrumental incoherence. Political leaders often implement institutional reforms, such as decentralisation, to address short-term political problems rather than achieving long-term governance improvements (Faguet, Shami, 2022). The motivations behind decentralisation in such a context can result in divergent outcomes based on whether the reform is designed to empower LGs (downwardly accountable decentralisation) or reinforce central authority (upwardly accountable decentralisation) (Faguet, Shami, 2022). These motivations tend to influence the design and implementation of reforms, which can significantly impact governance structures and public service delivery.

Studies have examined the normative framework regulating subnational government autonomy in Cameroon, emphasising the enduring setbacks and constraints that have impeded the effective decentralisation. Cheka (2007) argues that implementing decentralisation in the initial stage was restricted by the reluctance of the national government to transfer substantial responsibilities and resources to LGs. This accounts for the continued financial constraints and resource disparities face by subnational governments, weakening their capacity to effectively render public services and fully perform their mandate (Song, Vevanje, 2023; Kofele-Kale, 2011). Yombi et al. (2019), and Song and Vevanje (2023) posit that the 2019 law provides significant autonomy to local authorities and effective strategies for effective popular participation and the empowerment of traditional rulers in local administration. However, some scholars have argued legal and institutional constraints persist in restricting the practical exercise of autonomy by LG entities including national government oversight and regulatory powers, undermining the transfer of competencies and resources enshrined in the law (Kofele-Kale, 2011; Yombi et al., 2019; Song, Vevanje, 2021). While these scholars focus on the limitations of decentralisation in particular domains in Cameroon, the present study seeks to explore the legal constraints to effective decentralisation in Cameroon.

The analysis above highlights that decentralisation has emerged as a significant governance strategy in many African states, aimed at addressing governance challenges and enhancing local development (Rugeiyamu, Msendo, 2025). Scholars have identified various forms of decentralisation, including devolution, deconcentration, and delegation, each with distinct implications for local governance and public service delivery (Faguet, Shami, 2022; Smoke, 2015). The strengths of decentralisation, such as increased citizen participation and improved accountability, are well studied, particularly in contexts where LGs are empowered to provide tailored respond to community needs (Reddy, Govender, 2013; Zarychta et al., 2024). However, challenges persist, including limited autonomy, centralised control, and resource dependency, which hinder the effectiveness of decentralisation efforts (Kessy, 2023; Ogunnubi, 2022).

Despite the broad literature on decentralisation, significant gaps remain, particularly concerning the specific context of Cameroon. Previous studies have largely overlooked how local governance structures in Cameroon are affected by both central authority and local dynamics, leading to a lack of comprehensive understanding of the challenges faced by LGs in this setting (Mugavu, Mucunguzi, 2024). Additionally, while the existing literature emphasises the importance of political will and accountability, it often fails to address the unique socio-political environment of Cameroon, which may influence decentralisation outcomes differently compared to other African nations (Faguet, Shami,

2022). there exists a need to conduct an in-depth assessment of the specific normative constraints and their impact on the autonomy and policy-making prerogatives of LGs. This study aims to fill these gaps by examining the legal constraints to LG autonomy in Cameroon, thereby advancing the discourse on effective decentralisation in the country.

This paper is grounded in decentralisation theory which comprises a set of perspectives on power and resource allocation to various stages of government. The theory's key contention is that decentralisation can improve decentralised governance by enhancing autonomy, accountability and reaction to the population's needs (Tunio, Nabi, 2021). This theoretical lens suggests that effective decentralisation entails the devolution of authority and the creation of appropriate normative and institutional frameworks through legal, political and fiscal transfer of responsibilities to enhance the effective functioning of LGs (Morozov, 2016; Tunio, Nabi, 2021). Political decentralisation entails the transfer of policy-making prerogatives to local authorities, allowing for an effective representation of the citizens (Tunio, Nabi, 2021). The 2019 law aimed to promote the three perspectives; however, its effectiveness is undermined by a lack of clarity in its application, scarce financial resources and inadequate administrative capacity (Fombad, 2019).

#### 4. METHODOLOGY

This qualitative case study draws on a doctrinal legal analysis approach (Hutchinson & Duncan, 2012) to investigate the degree of LG autonomy in Cameroon. This approach commonly adopted in public administration research entails the methodical review of legal texts, acts and jurisprudence to understand the law's construction, interpretation and enforcement (Dobinson, Johns, 2017). The paper also employed on a case study approach to provide an in-depth understanding of LG autonomy in the specific context of Cameroon. This approach allows for a detailed exploration from the diverse perspectives of the intricacies and specificities of a particular system, policy, or project in a real-life situation (Loraine et al., 2019).

The study relied on secondary data sources, reviewing academic outputs, the main legal framework regulating LGs in Cameroon – the 2019 law – and other relevant texts. Additionally, the paper incorporates qualitative insights from available reports and publications that reflect the perspectives of LG officials and citizens. This exploration of lived experiences offers a richer perspective of the difficulties and opportunities of decentralisation in Cameroon. The study also reviewed key scholarly literature on decentralisation and LG autonomy. The reviewed academic outputs and reports, provided significant theoretical and contextual premises to guide the interpretation of decentralisation legal frameworks in Cameroon.

The paper employed a thematic analysis technique to appraise the data collected. This technique permits the collection, analysis and communication of recurring patterns in qualitative data (Terry et al., 2017). In analysing the 2019 law, attention was paid to the sections that outline the prerogatives and duties of LGs, their policy-making autonomy, resource allocation tools, and the central government's administrative control and oversight. This analysis drew upon the decentralisation dimensions discussed above (Morozov, 2016) to ascertain how provisions the 2019 law promote or constrain LG autonomy in Cameroon. The study acknowledges the limitations of relying primarily on secondary qualitative data, wherein the absence of original data limits the depth of empirical analysis. Notwithstanding, the paper's rigorous analysis of legal texts and

thematic synthesis of secondary data provide a solid basis for assessing the implications of legal constraints on LG autonomy in Cameroon.

## **5. LEGAL CONSTRAINTS ON LOCAL GOVERNMENT AUTONOMY IN THE 2019 LAW**

The 2019 law in Cameroon outlines the regulatory and institutional mechanisms governing regional and LG entities in Cameroon. However, while the legal text purports to enhance the autonomy to these decentralised authorities, a critical assessment unveils several constraints that challenge their actual exercise of self-governance. This section examines the various limitations to the exercise of LG autonomy as articulated in the 2019 law.

### **Central government oversight and supervision**

A remarkable feature of 2019 law is the extensive prerogatives it grants to the national government to oversee and supervise regional and LG entities. According to the 2019 Law, “the Governor and Senior Divisional Officer appointed by decree of the President of the Republic shall be the representative of the state in the Region and Council respectively”. This hierarchical oversight empowers these officials to ensure significant supervisory control over LGs, including the requirements for LGs to obtain prior approval for budget validation, loans, international cooperation agreements, and development plans (Sections 72-77). This strict control mirrors political patronage and the political culture of centralised governance established post-independence, rooted in the colonial system to limit local autonomy and maintain central authority.

Sections 77(4) and 325(3) empower the state representative to unilaterally invalidate LG decisions or postpone Council sessions. Furthermore, any resolution instituting a special deputy Mayor must be tendered to the supervisory authority for prior approval (Section 198(1), 2019 Law). Such powers demonstrate the central government’s persistent influence over LG policies, regardless of the political affiliation of LG officials. This denotes electoral authoritarianism, where elected local officials are often beholden to the national government rather than their electorate. This has been evident with the ruling Cameroon People’s Democratic Movement (CPDM), which has marginalised opposition and controlled electoral processes since the reintroduction of multipartyism in 1990 (Bertelsmann, 2024). This political context dissuades genuine local governance and citizen engagement, as local leaders are void of political backing to assert their autonomy. The ability of the President of the Republic and the Minister of Decentralisation to suspend or dissolve Regions and Councils (Sections 296-297, 186-187) acts as a deterrent to local officials who may pursue policies contrary to central government interests. This oversight serves as a control mechanism and a warning against dissenting governance practices and competing interests.

### **Financial independence and allocation of resources**

While section 11 of the 2019 law grants LGs financial autonomy to manage their budgets, section 12 complicates this autonomy by stipulating that the necessary resources “shall be allocated to them either by transfer of taxes or grants, or both” by the state. The requirement for budget approval by the supervisory authority, which can unilaterally amend the budget (Section 427(1), 2019 Law), undermines the elected officials’ accountability to their constituents. This dependency on central government validations

can distort local public service delivery, as decisions may be influenced more by the state representative than local needs, stunting local development and eroding trust in LGs.

Moreover, Sections 376(1) and 384 prohibit LGs from adopting an annexed budget or securing decentralised cooperation funding without state consent. These restrictions narrow LGs' ability to generate funds for developmental projects, introducing administrative hurdles often characterised by inefficiencies and corruption. Also, external loans and donations require state approval (Sections 399(3), 400), further constraining financial independence and delaying project execution. The bureaucratic delays stemming from these legal requirements create an enormous challenge to effective governance. The financial dependence on the central government for funding and budgetary approval creates competing interests, as LGs may prioritise their constituents' needs while being constrained by budgetary allocations from the national government, undermining the implementation of development projects tailored to the communities' needs (Kaze et al., 2023). The law further empowers state representatives to arbitrate in budgetary disputes (Section 423), effectively sidelining elected officials in crucial financial decisions.

### **The recruitment and management of human resources**

The 2019 law does empower RLA with the authority to recruit and manage LG staff (Section 22(1)), yet this autonomy is weakened by the national government's control over important appointments. While Mayors can hire and manage council personnel (Section 209(1)), key positions, such as Secretaries General and Financial Controllers, Accounting Officers and Treasurers are appointed by the central government (Sections 323, 214, 436, 439). This appointment process jeopardises local governance, as these officials may prioritise loyalty to central authorities over their responsibilities to local councils and the immediate hierarchy. Furthermore, the law provides that the state representative holds significant powers over recruitment processes, creating potential conflicts in administration and undermining the principle of local governance.

### **Constraints on the decentralised governance process**

Beyond the legal constraints described above, the 2019 law has established institutional and governance mechanisms at the subnational level that can further erode local self-rule. The creation of a hierarchical multi-tier decentralised governance structure, comprising Regions, City Councils, Subdivisional Councils, and Councils (Sections 259, 240, 250, 147), complicates the coordination and alignment of priorities across different levels of government. This complexity can impede LGs' capacity to effectively address the needs of their communities and align their activities with local priorities. Furthermore, these constraints restrict the ability of LGs to engage citizens in local governance, leading to low public trust and engagement, as the population feel disconnected from decision making processes that concern them (Quirk, Montemarano, 2020).

The broad constraints imposed by the 2019 law demonstrate a persistent pattern of centralized control which undermines the intended LG autonomy. This law serves a dual purpose, as a tool for managing local governance and a mechanism for strengthening central government's dominance over LGs, restricting genuine local governance and citizen participation.

## 6. THE IMPLICATIONS OF THE LEGAL CONSTRAINTS ON LOCAL GOVERNMENT AUTONOMY

This paper examines the legal constraints on subnational government autonomy in the 2019 law, emphasising how these barriers undermine effective decentralisation and public service delivery. Employing a qualitative design, the study reveals significant legal and institutional constraints and challenges to the autonomy of LG entities in the country.

### **Constraints on local governments' self-governance**

The strict control exercised by the central government over the RLAs as enshrined in the 2019 law, particularly regarding the appointment, suspension and dismissal of staff, constitutes a major constraint to LG independence. Advocates of decentralisation postulate that the degree of discretion that subnational governments possess in designating their leaders and management staff is directly linked to the level of political decentralisation (Kis-Katos, Sjahrir, 2017). The 2019 Law reveals Cameroon's choice for administrative decentralisation as opposed to the comprehensive process, so as to effectively control LGs. This is consistent with Falleti's (2005) STD in which she argues that most states opt for administrative decentralisation to ensure dependence and strictly monitor LGs activities. This dependency critically undermines regional and municipal authorities to make decisions, hindering decentralisation goals. Researchers like Croese et al. (2021) and Mohmand and Loureiro (2017) such acts of political intrusion and patronage promote strong LG dependence.

The 2019 Law outlines the duties of the Mayor (Section 206(1)), yet many of these decisions require the approval of the state's representative. This significantly undermines the powers of LGs, and resonates with critiques from Song and Vevanje (2023) who argue that such wide powers entrench the centralised state apparatus, depriving LGs of effective autonomy. For instance, citizens hold that the central government is adamant to share policy making authority with the Regions, while some regional Councillors perceive the state representatives as the real policymakers of the Regions (Ndiyun, Mukonza, 2025). This highlights traits of nominal autonomy and resonates Lameck's (2023) argument in Tanzania that LGs act as implementers of national policies.

Moreover, the lack of effective decision-making freedom raises concerns about the potential for recentralisation (Mugavu, Mucunguzi, 2024). Although the law allows elected local officials to appeal disapproved decisions to administrative courts (Section 79), the staff of these courts are also appointed by the central government, raising questions about the impartiality of such appeals. Song and Vevanje (2023) argue that subnational authorities in Cameroon have been granted a façade of self-rule, as central state representatives still control critical aspects of governance, interrogating how LGs can ensure effective service delivery in the context of false autonomy. This resonates the experience in Zimbabwe, where Nyikadzino and Vyas-Doorgapersad (2022) describes the decentralisation process in the country as centralisation through decentralisation.

### **Financial Dependence and Resource Allocation**

The 2019 law also establishes excessive dependence of LGs on the central government for funding and resource allocation, which contradicts the financial independence purportedly granted in Section 11. The national government determines financial allocations through the annual state budget, echoing findings from Shair-Rosenfield (2024) that many LGs in developing countries struggle with resource generation. This situation is

similar to Rugeiyamu's (2024) findings in Tanzania, where LGs fund only 10% of their budgets, with the central government covering the remaining 90%. Song and Vevanje (2023) argue that this financial dependence poses a significant threat to LGs' autonomy, a sentiment echoed by Yombi et al. (2018), who note that financial dependence is a common issue among decentralised governance entities in Africa. In Cameroon, Ndiyun and Mukonza (2025) note that while the 2019 law established a decentralisation fund to which the central government should allocate 15% of the state budget annually, the total amount has never been disbursed to RLA. 7.2% and 8% were allocated for 2022 and 2023 respectively, reflecting the state's prioritisation of administrative decentralisation.

### **Restriction on the local governance process in Cameroon**

The hierarchical structure of local governance established by the 2019 law complicates coordination among various subnational governments, contradicting Shair-Rosenfield's (2024) argument for effective intergovernmental coordination in decentralisation. This structure undermines LGs' ability to address community needs effectively, as outlined in local governance theory (Tunio, Nabi, 2021). Furthermore, the law lacks clear mechanisms for accountability and transparency in policy-making and resource allocation, which are critical components of effective local governance.

The findings of this research align with existing literature on decentralisation in Cameroon and other developing countries. Previous studies, such as those by Eyoh and Stren (2007) and Mugavu and Mucunguzi (2024), have shown that national governments exert significant control over subnational policy-making, undermining their independence. Similarly, Smoke (2015) highlights the common issue of subnational governments' dependence on national governments for funding, which constrains their ability to deliver public services effectively. Equally, key factors that constrain the independence of LG identified in this paper such as excessive oversight and supervision mechanisms, lack of financial freedom, and centralised prerogatives of appointing and dismissing LG staff are consistent with the broader scholarly works on the setbacks of implementing effective decentralisation reforms in third world countries (Kis-Katos, Sjahrir, 2017). These features also reflect the history of governance characterised by a highly centralised system, similar to the Zimbabwe context as analysed by Nyikadzino and Vyas-Doorgapersad (2022).

### **Implications for democratic governance and local development**

The study's findings have profound implications for democratic governance, local development and service delivery in Cameroon. The dependency of RLAs on the central government hinders their functional autonomy and weakens their accountability to constituents, presenting strong implications for governance, particularly eroding local autonomy, marginalising the opposition and civil society, and limiting citizen engagement in governance processes (Bertelsmann, 2024; Quirk & Montemarano 2020). The findings also highlight an elite-captured process which favour political patronage as witnessed in Kenya (Lubuulwa 2021), with a top down approach that prioritises national over local interests (Vargas Falla, 2025). This situation reflects a lack of political commitment to genuine decentralisation, suggesting that the current framework is more about upwardly accountable decentralisation aimed at reinforcing central authority (Faguet, Shami, 2022; Ricart-Huguet & Sellars, 2023). Consequently, this disconnect has resulted in public disenchantment with governance, as citizens perceive local authorities as unproductive or insensitive to their welfare. The Anglophone crisis which erupted in 2016 and later

escalated into an armed conflict was partly triggered by excessive centralisation of state authority (Ndiyun, Mukonza, 2025).

The legal constraints also present significant implications for public service delivery. LGs inability to make independent decisions results in inefficiencies and delays in service delivery, further exacerbating public disillusionment and eroding trust in local governance (Bertelsmann, 2024). Equally, financial dependence on the central government restricts LGs' ability to innovate and enforce development projects targeting their specific contexts, stunting local economic growth and worsening disparities in service provision between rich and limited resources regions (Quirk, Montemarano, 2020). Additionally, the lack of accountability mechanisms within the 2019 law permits for corruption and misappropriation, further reducing the quality of public service and eroding public trust in LGs (Quirk, Montemarano, 2020).

Furthermore, the legal constraint discussed above have bearings on local development, particularly in promoting social disparities, community disengagement, weak governance and stunted development. For instance, regions with weak LGs grapple to attract investments and provide basic services, resulting in increased poverty and inequalities (Bertelsmann, 2024). The inability to provide community needs due to legal and administrative blockades causes citizens to be disengaged from development efforts. This detachment can further provoke civil unrest and conflict, particularly in marginalised areas, as evidenced by the Anglophone crisis which has protracted for over 8 years in the former British Southern Cameroons with protests of marginalisation demands for self-rule (Ndiyun, Mukonza, 2025). The research findings which resonate with available literature (Kessy, 2023; Mugavu, Mucunguzi, 2024) on challenges to decentralisation in Africa underscores the need for clearer legal frameworks and improved capacity-building strategies as well as potential reforms that could enhance LG autonomy and effectiveness.

## 7. LOOKING FORWARD

The findings of this paper identified the issue of political interference and hijacking of the decentralisation process in Cameroon by central government. These issues can be addressed through legal and institutional reforms, reinforce local governance structures and financial autonomy, and enhanced public engagement. Researchers like Mohmand and Loureiro (2017) and Smith (2023) have highlighted how central governments use decentralisation reforms to maintain their grip on power, rather than a genuine tool to strengthen subnational governments. This challenge can be overcome if the central government shows the political will to grant full enfranchisement to LGs. The literature emphasises the need for an explicit legal framework that defines LGs' prerogatives, duties, and autonomy (Mohmand, Loureiro, 2017). In Cameroon, achieving this self-governance requires a robust reform of the existing legislation on decentralisation to limit national government intrusion in local governance management and institute legal safeguards for subnational governments' autonomy (Berinyuy, 2025). This will curtail the excess powers of the central government over LGs, including the power to suspend and dissolve LGs.

As indicated in the literature and revealed in the findings, LGs' dependence on financial subvention from the state significantly undermines their independence and service delivery. Researchers like Martínez-Vázquez et al. (2017) argue that effective fiscal decentralisation – including devolving significant financial resources and income-generating powers – is a crucial pillar of LG autonomy. Financial decentralisation can be achieved by granting LG deliberative organs unfettered competence to adopt and collect

certain regional and communal taxes enumerated in the 2019 Law and granting LGs a regular and equitable flow of intergovernmental fiscal allocations (Voufo, Tametong, 2021).

Moreover, one of the elements identified in the literature and noted in the analysis of the 2019 law in Cameroon is the need to enhance LGs' administrative, technical and management potentials to promote their independence. This solution proposed by Martinez-Vázquez (2017) can be realised in Cameroon by organising training programmes, undertaking infrastructural development projects and granting technical support to LGs. Song and Vevanje (2023) argue that Although some institutions like the National School of Local Administration (NSALA) has been created to enhance the capacity building of local administrators, political, institutional and financial constraints persist, requiring an in-depth overhaul to improve local governance. Beyond strengthening LG capacity, their accountability should be promoted through transparent tools, managerial output monitoring and constituent oversight to limit political intrusion.

## 8. CONCLUSION

This study has demonstrated that the legal constraints on LG autonomy in Cameroon are ingrained in historical and political contexts that promote centralisation, and aid to strengthen central control and limit local participation. The centralised prerogative over the appointment and dismissal of LG personnel, excessive oversight and supervision strategies, the complex multi-tier local governance system and LG's reliance on funding and resource allocation from the central government all account for a legal framework that undermines the ability of territorial entities to make independent decisions and effectively address the needs of their population.

The research findings suggest that while the state of Cameroon has recorded some strides to decentralise its governance system, the 2019 Law embodies a persistence of the national government's hesitancy to relinquish control over the decentralisation process. This reveals that the legal constraints are rooted in historical and political contexts that perpetuate centralisation, and that Cameroon prefers the administrative to fiscal and political dimensions of decentralisation, to effectively monitor the lower tiers of government. The findings demonstrate that the 2019 reforms while intended to promote decentralisation, depicts aspects of nominal autonomy, that serves to reinforce central control and restrict local responsiveness. The results further underscore that genuine decentralisation requires not only legal reforms but also a resolve to address structural inequalities and promote local accountability. Further avenues for reform should target improving local fiscal autonomy, and empowering communities to fully engage in governance processes. The challenges encountered in Cameroon's decentralisation process are consistent with experiences in other African states such as Zimbabwe, Kenya and Tanzania. This underscores that the issues observed in Cameroon are not isolated but highlight patterns of governance in post-colonial settings. Such parallels foster an understanding of how legal frameworks can be employed to enable or hinder local governance.

The qualitative nature of this study presents a limitation, making it not possible for its findings to be generalisable in Cameroon. Equally, the study does not fully integrate citizen's perspectives and those of other decentralisation stakeholders in Cameroon. These perspectives could provide supplementary insights into the effectiveness of local governance autonomy. Future studies could tackle these limitations by adopting mixed

methods to capture a broad range of perspectives to obtain an inclusive perception of local governance barriers. Furthermore, comparative and case studies could also be undertaken with other countries witnessing similar decentralised governance difficulties to gain more understanding.

All authors have read and agreed to the published version of the manuscript.

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**Simon Matome NKGAPELE<sup>1</sup>****Sifiso MOFOKENG<sup>2</sup>****Beauty ZINDI<sup>3</sup>**

## PERFORMANCE REPORTING AND CAPACITY BUILDING FOR BETTER SERVICE DELIVERY IN THE SOUTH AFRICAN GOVERNMENT

Effective performance reporting is important for improving accountability, transparency, and efficiency in the South African government. However, many government institutions struggle with unreliable information and poor-quality data. This article aims to examine the current state of performance reporting in South Africa and to explore how capacity can be strengthened to improve the quality and reliability of reports. The article used a qualitative research approach and reviewed existing literature, policy documents, and government reports. The findings indicate that performance reporting in the South African government is hindered by limited skills, weak institutional capacity, and inadequate Information Communication Technology (ICT) infrastructure, affecting accountability and service delivery. These challenges lead to inconsistent and unreliable reporting, which weakens accountability, governance, and service delivery. This article contributes by proposing strategies to improve performance reporting and capacity building for better service delivery. These strategies suggest that investing in human capital, integrating digital technologies, and promoting mentorship and knowledge-sharing are essential for enhancing performance reporting, strengthening accountability, and improving service delivery in the South African government.

**Keywords:** performance reporting, service delivery, capacity building, South African government.

### 1. INTRODUCTION

Effective performance reporting is critical for enhancing accountability, transparency, and efficiency in South African government institutions. As a cornerstone of good

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<sup>1</sup> Simon Matome Nkgapele, Sol-Plaatje University, South Africa; e-mail: simteesa@gmail.com (corresponding author). ORCID: 0000-0003-1171-5696.

<sup>2</sup> Sifiso Mofokeng, Nelson-Mandela University, South Africa; e-mail: s217450857@mandela.ac.za. ORCID: 0000-0001-9710-599X.

<sup>3</sup> Beauty Zindi, University of Fort-Hare, South Africa; e-mail: letwinbee@gmail.com. ORCID: 0000-0003-4790-5379.

governance, performance reporting provides a framework for evaluating institutional objectives, ensuring compliance with legislative requirements, and fostering continuous improvement (Christensen, Im, Porumbescu, 2022). Government institutions are expected to be service delivery-driven, with measurable impacts from public expenditure and full accountability for spending and performance (Mohangi, Nyika, 2023). Performance information is often used to guide decisions on further spending and other government interventions, making the reliability of reported performance data highly significant. Performance reporting in South Africa encompasses several key instruments, including performance indicators, analytical reports, Annual Performance Reports (APRs), and performance audits. These instruments serve to monitor progress against strategic objectives, provide insights into service delivery outcomes, and facilitate oversight by the executive, legislature, and the public.

When accurate and reliable, they strengthen governance, inform policy decisions, and improve service delivery across critical sectors such as health, education, and infrastructure development. However, the quality and usefulness of performance reporting in South Africa are undermined by both technical and political challenges. On the technical side, inadequate expertise, poor data management, and weak institutional capacity often compromise the accuracy, reliability, and timeliness of performance reports (Dweba, Thakhathi, 2021; Zindi, Majam, 2024). When it comes to political challenges, Molobela (2024) share that political – administrative interface, undermine the integrity of performance reporting in South Africa. This is because political interference may result in the manipulation, selective presentation, or suppression of performance data to protect institutional reputation, justify budget allocations, or align reporting outcomes with political agendas. This often shifts the focus from objective evidence and developmental outcomes to politically visible achievements, thereby compromising transparency, accountability, and evidence-based decision-making. As a result, the credibility and usefulness of performance reporting systems are weakened, showing the necessity for stronger administrative independence and oversight mechanisms.

Capacity-building initiatives, which strengthen skills, knowledge, and systems within government institutions, are therefore critical to improving reporting practices and ensuring meaningful use of performance information (Maake, Harmse, Schultz, 2021). A primary objective of the South African government following 1994 was to expand access to, and improve the quality of, services for historically marginalised communities (Mohangi, Nyika, 2023). The South African Constitution mandates efficient and accountable management of public resources, alongside parliamentary oversight and rigorous scrutiny of government performance. In response, the government implemented government reforms, including budgetary reforms focused on transforming public expenditure management into a performance budgeting framework aimed at achieving value-for-money outcomes (Asbari, Hidayat, Purwanto, 2021).

Performance reporting is legislatively required under the Public Finance Management Act (PFMA, No. 1 of 1999) and the Municipal Finance Management Act (MFMA, No. 56 of 2003), obliging government institutions to produce APRs aligned with their strategic objectives and budgets. These reports are essential for measuring institutional performance, ensuring transparency, and fostering public trust. Despite this legislative framework, many government institutions struggle to produce reliable, accurate, and timely reports due to limited technical capacity and political pressures. For example, the Auditor-General of South Africa's 2024 report found that over 60% of municipalities failed to comply with reporting requirements, citing insufficient skills and inadequate systems for data collection

and analysis (Auditor-General of South Africa, 2024). Moreover, national and provincial departments often fail to link performance indicators to measurable outcomes, creating a disconnect between intended goals and actual impact (Ji, 2022).

In recent years, several initiatives have sought to strengthen performance reporting and capacity. The Gauteng Provincial Government implemented a capacity-building initiative to train officials in performance management, data analytics, and compliance (Christensen et al., 2022). The National Treasury, in partnership with the Department of Cooperative Governance and Traditional Affairs (COGTA), has developed toolkits and guidelines to assist municipalities in aligning their reporting frameworks with regulatory requirements (Zindi & Majam, 2024). Training workshops, performance dashboards, and partnerships with academic institutions, such as the University of Pretoria's certification programmes in performance management, have also been employed to improve reporting quality (Mohangi, Nyika, 2023; Dweba, Thakhathi, 2021; Maake et al., 2021). Regardless of these initiatives, challenges in implementation and effectiveness still persist across government institution South Africa. This indicates that current interventions are not fully addressing the underlying issues affecting performance reporting practices. The gap, therefore, lies in understanding the historical and current conundrums that continue to affect performance reporting and capacity building, as well as why existing strategies have not achieved the desired outcomes. This article responds to this gap by:

- Examining the historical and current conundrums in performance reporting and capacity building within the South African government.
- Proposing strategies for strengthening capacity building to enhance performance reporting practices in the government.

## 2. LITERATURE REVIEW

### 2.1. Theory Underpinning the Study

This article conceptualises capacity building in performance reporting through a government capacity framework rather than relying solely on Human Capital Theory (HCT). While HCT emphasises investing in individuals' skills, knowledge, and experience (Becker, 2009; Schultz, 1990), the challenges of performance reporting in South African government institutions extend beyond technical skills to include organisational structures and institutional systems. Capacity building in this context involves developing not only human capital through education, training, and mentorship, but also strengthening institutional systems and processes that enable reliable and accurate performance reporting (Zindi, Majam, 2024; Harmse, Schultz, 2021). For example, the City of Cape Town introduced a performance management training program in 2017, which improved the accuracy of reports and reduced errors identified by the Auditor-General (Motshwane, Van Niekerk, 2022). This illustrates the importance of both individual skill development and system-level support for enhancing reporting quality.

This indicates that adopting this integrated framework, the article aligns with its objectives to examine historical and current conundrums in performance reporting and to propose strategies for strengthening capacity building in South African government institutions. The framework states that capacity building is multidimensional, encompassing human skills, organisational systems, and governance structures, all of which are essential for reliable reporting, accountability, and improved service delivery (Haque, Fernando, Caputi, 2021; Christensen et al., 2022). This approach moves beyond

the individualistic focus of HCT and situates performance reporting within the broader public governance and administrative system. This provides a more appropriate theoretical perception for understanding the technical and institutional challenges in the South African context.

## **2.2. The conceptual understanding of Performance Reporting and Capacity Building**

Capacity building plays a vital role in performance management and reporting, serving as a mechanism that helps institutions adjust to emerging challenges and opportunities. It is a multifaceted approach encompassing the provision of training, education, and mentoring to strengthen employees' skills in performance reporting, including data collection, analysis, and effective communication (Utete, 2021; Williams, 2022). The definition of capacity building varies based on context. For instance, the United Nations Development Programme (2009) defines capacity building as the process by which individuals and institutions obtain, improve, and retain the skills, knowledge, tools, equipment, and other resources needed to do their jobs competently or to a greater capacity. Ndou and Sebola (2016) define capacity building as the deliberate and consistent investment in human capital in order to enhance the efficiency, effectiveness, and sustainability of service delivery. This definition is supported by Utete (2021), who posits that capacity building acquisition, development, and maintenance of the knowledge, skills, and abilities needed to successfully carry out an institution's mission and achieve its goals.

In light of these definitions, capacity building in the context of the government in South Africa refers to the intentional and systematic efforts to develop the skills, knowledge, and abilities of employees and institutions to ensure they have the competencies necessary for effective performance management and reporting. Capacity building and Performance management are interrelated constructs. Makau (2017) and Utete (2023) argue that Capacity building facilitates effective performance management through the development of necessary skills and knowledge among employees. This suggests that capacity building enables government institutions to implement performance management systems more effectively, leading to improved efficiency and accountability. On the other hand, Morkel and Ramasobama (2017) posit that performance reporting provides feedback for capacity building through the collection and analysis of performance data. This assists government institutions in the identification of areas where capacity-building initiatives are needed. This is illustrated in the case of the City of Tshwane, which has struggled with low rates of citizen engagement in its annual budgeting process, which has led to insufficient budgetary allocations for key services like water and waste management. However, this predicament was resolved through the introduction of a capacity-building initiative that was focused on performance reporting and community engagement. The initiative trained staff on aspects such as effective communication and data collection techniques, which enabled them to better engage with citizens and gather feedback on service delivery needs (Matlali, 2023).

## **2.3. Performance Reporting Practices in Government**

In South Africa, performance reporting practices in the government are a legislative requirement as mandated by the Public Finance Management Act no 1 of 1999 (PFMA), which outlines that government institutions need to prepare and submit annual performance reports. Performance reporting practices in the government of South Africa are characterised by challenges. This is evidenced in studies by Masombuka and Thani (2023) and Masilo, Masiya and Mathebula (2021), who show that the reports prepared by government institutions serve as a means of monitoring and evaluating the effectiveness of

government programs and initiatives while ensuring that public resources are utilised efficiently and effectively. Performance reporting practices in the South African government have been characterised by a range of issues and challenges, such as ineffective monitoring and valuation systems, weak institutional oversight and accountability mechanisms, poor data quality and collection practices, and inadequate staff training and capacity building (Mabizela & Zwane, 2023). Various studies on performance reporting in the government of South Africa found that many institutions struggle with inadequate staffing levels, insufficient training, and poor retention rates, which undermine their ability to effectively implement performance reporting systems and processes (Ogony, Majola, 2018; Govender, Bussin, 2020; Thusi, Chauke, 2023; Zindi, 2024; Mofokeng, Ramolobe, Bogopa, 2025).

According to Ogony and Majola (2018), the high staff turnover rates in South African government institutions, with a specific focus on mid-level management positions, present a significant obstacle to the effective implementation and maintenance of performance reporting practices. On the other hand, Thusi and Chauke (2023) highlighted that many government institutions in the country have insufficient personnel to effectively manage and report on performance data, particularly in under-resourced areas such as rural municipalities. This is further supported by Zindi (2024) and Mofokeng, Ramolobe, and Bogopa (2025), who suggest that staffing challenges are exacerbated by a lack of funding for human resource development in South African government institutions. These staffing challenges subsequently affect the performance of government institutions. However, Govender and Bussin (2020) opine that performance reporting practices in the South African government are hampered by a lack of commitment to performance management. This breeds resistance to change and a reluctance to adopt new systems and processes, as well as an unwillingness to implement performance management systems effectively (Mofokeng et al., 2025). Dlamkile, Nkabinde, and Nkgapele (2025) maintained that most government institutions engage with these performance management systems primarily for compliance purposes. This, at times, results in inaccurate performance reporting, an issue that persists and has been evident over the past several years. This lack of commitment often comes from a perceived lack of incentives for staff to prioritise performance reporting, as well as a lack of clear policies and procedures for performance management processes. Altogether, these studies show the interconnected nature of the challenges facing performance reporting practices in the South African government.

#### **2.4. Challenges in Capacity Building for Performance Reporting**

Capacity building is an essential process for strengthening performance reporting practices in the South African government. However, despite the significance of capacity building as a crucial instrument in improving performance reporting practices, this phenomenon has faced a number of limitations that hamper its effective implementation (Utete, 2021). Studies by many scholars show the challenges of capacity building for performance reporting, such as limited buy-in from stakeholders, the lack of standardisation and harmonisation of reporting systems, weak enforcement mechanisms, ineffective coordination and communication between government institutions (Morkel, Ramasobama, 2017; Utete, 2023; Dweba, Thakathi, 2021; Maake et al., 2021; Ngqobe et al., 2021). Limited buy-in from stakeholders can hamper the effectiveness of capacity-building initiatives for performance reporting. For instance, Utete (2023) indicates that some stakeholders, particularly those in senior management positions, perceive performance reporting as an additional bureaucratic exercise rather than a useful tool for

decision-making and resource allocation. In addition, the lack of standardisation and harmonisation of reporting systems across the South African government is another challenge that impedes the effectiveness of capacity-building initiatives for performance reporting (Utete, 2021; Dweba and Thakathi, 2021).

This challenge is compounded by the limited buy-in from stakeholders, as identified by Utete (2023). Edoun et al. (2023) posit that without a consistent and standardised approach to performance reporting, different government institutions may use different formats, standards, and methodologies for collecting, analysing, and reporting performance data. A report by the Auditor General of South Africa (2018) found that government departments were often unable to provide accurate and reliable performance reports due to inadequate data collection, analysis, and reporting practices. This is exemplified by Gauteng, where hospitals were collecting patient data manually, while others had implemented electronic systems, leading to inconsistencies in data quality and reporting. This lack of standardisation hampered the capacity-building efforts of the Department of Health in pursuit of effective performance reporting (Zharima, Griffiths, Goudge, 2023; Motsi, 2024). This has led to additional problems, going beyond the mere reporting of performance information. It has resulted in the department not having the necessary information to defend itself in legal matters, particularly in the Department of Health, which is continuously facing medical litigation claims and losing these cases because of poor recordkeeping of patient information.

In addition to the lack of standardisation and harmonisation of reporting, there are also issues of ineffective coordination and communication between government institutions (Utete, 2021). Williams (2022) states that poor coordination and communication across different levels and departments within the South African government led to the duplication of efforts, which results in contradicting results and missed opportunities for collaboration and knowledge sharing. This is demonstrated between the provincial Department of Cooperative Governance and Traditional Affairs (COGTA) and various local governments in the province of KwaZulu-Natal, where the lack of coordination and communication resulted in delayed and incomplete submissions of performance reports, which in turn hindered effective monitoring and evaluation (Mchunu, Dlamini, 2020). This example shows that the lack of coordination further hinders capacity-building initiatives as government institutions tend to struggle with aligning their performance reporting practices with each other and the broader objectives of the government.

### 3. METHODOLOGY

This article is based on a qualitative narrative synthesis of secondary literature. Both grey and academic literature were reviewed using the keywords “performance reporting” and “capacity building” within the context of South African government institutions. The review was combined with abstraction, as some of the issues addressed in the article require in-depth analysis beyond empirical data or direct quotations typically found in quantitative or qualitative studies (Kumar, 2019). The documents selected focused on performance reporting, performance management, and capacity building for public servants, and they informed the development of this article. Rather than applying rigid inclusion criteria, the article prioritised texts that provided detailed information on the challenges, practices, and developments in performance reporting within South African government institutions. The narrative synthesis approach allowed for the integration and interpretation of findings

across multiple sources, demonstrating key themes and trends in capacity building and reporting practices.

#### **4. RESULTS AND DISCUSSION**

##### **4.1. Performance Reporting and Capacity Building in the Government of South Africa: Where do we come from and where are we now?**

In South Africa, it is a legislative requirement for government institutions to submit annual reports on their performance in relation to predetermined objectives, as specified by the PFMA, Municipal Finance Management Act (MFMA), and the Municipal Systems Act. However, the quality of performance reporting differs considerably among these institutions. The quality of performance reporting has always been a continuing concern in government institutions. This is demonstrated by an analysis of national government departments' reports for the financial years between 2009/10 and 2010/11, which revealed ongoing deficiencies without any significant improvement in the quality of the reported performance information (Maluleke, 2016). Authors such as Ngqobe, Fourie, and Tshiyoyo (2021) believe that this is caused by factors such as political/administrative interface, instability in administrative leadership, a shortage of skills, deterioration of accountability and authority, poor organisational design, inappropriate staffing, and low staff morale. This shows the significance of strengthening capacity to ensure effective performance reporting, as competent and proficient personnel are essential for producing high-quality and dependable performance information.

In 2015, Cameron (2015) investigated the implementation of performance management systems in the government and pointed out that simply possessing such a system does not indicate the quality of the performance data. Cameron highlighted the Auditor-General's findings, showing that the performance data of 25 out of 35 national departments failed to meet regulatory requirements and lacked utility or reliability. Similarly, 72 percent of provincial departments faced this issue. The author attributes this problem to a lack of capacity. Cameron (2021) states that due to this deficiency, many provincial government entities struggle to deliver accurate and detailed data. The issue of unreliable performance data persists at present, as demonstrated by the audit reports from the AGSA, which consistently indicate that the reported performance data remains unreliable (Auditor General, 2022; Auditor General, 2023; Auditor General, 2022). Makau (2017) believes that the inability to produce accurate and reliable performance data stems from a lack of necessary capacity within the government. The author further proposes that to tackle these challenges, efforts should focus on enhancing the government's workforce's ability to execute relevant tasks under the institution's comprehensive performance standards.

This includes creating capacity-building training programs designed to improve performance reporting skills across all government bodies. At present, programs designed to improve skills in performance reporting are frequently irregular and lack depth, largely depending on short-term workshops that fail to provide lasting learning (National Treasury, Nd). Moreover, the inconsistent adoption of digital tools across departments further adds to the variability in reporting quality (Alonge, Dudu, Alao, 2024). This raises the question of whether South Africa is prepared to completely transition to digital platforms and if all public service employees can effectively engage with these digital tools. Scholars such as Balkaran (2017) criticised the South African government for its lack of readiness to fully transition to digital systems, attributing this to insufficient investment in infrastructure and a shortage of information and communication technology personnel. This issue was further

emphasised by recent e-government scholars, who continuously preach that the South African government is not yet ready to fully become a digitalised country (Nkgapele, 2024; Nkgapele, Mokgolobotho, 2024).

They argue that there is still a need for skills, especially when it comes to information and communication technology personnel. The National Treasury's Capacity Development Strategy recognises that effective financial management is vital for proficient and effective public service. However, obstacles such as limited skills, high vacancy rates, staff turnover, and a lack of appropriate education, training, and development programs impede the growth of public financial management capacity (National Treasury, Nd; Nama, Daweti, Lourens, Chikukwa, 2022; Thusi, Chauke, 2023). The National Treasury's Capacity Development Strategy stresses the necessity for a comprehensive and coordinated approach to capacity development, acknowledging the factors that can either aid or obstruct progress. Additionally, the State of the Public Service Report 2021/22 underscores that the capability and capacity of the public service are crucial for successful performance reporting (Public Service Commission, 2021). The report seeks to encourage more dialogue on developing a capable and professional public service that can fulfil its duties. This is because performance reporting enables government institutions to explain how they carried out their responsibilities to achieve their objectives, support service delivery priorities, and demonstrate how public funds were used to reach those goals. Despite these efforts, the current state of capacity building in performance reporting shows a requirement for more organised and long-term methods to develop skills and fully integrate technology. This will significantly enhance performance reporting and encourage better service delivery across government institutions.

#### **4.2. Performance Reporting in Government Institutions in South Africa: Current Challenges**

Building capacity for performance reporting in the South African government encounters numerous substantial obstacles that hinder operational effectiveness and efficiency. A primary challenge is the inadequate administrative capacity and skills shortage within municipalities (Chirau, Blaser-Mapitsa, 2020). Many government institutions face difficulties due to insufficient human resources (Mashamaite, Lethoko, 2018), limiting their capability to provide essential services and manage public affairs efficiently. This issue frequently arises from a lack of training and development programs specifically designed for public servants, resulting in a workforce unprepared for the complexities of performance reporting (Ei, Vk, Solly, 2023). Moreover, the deteriorating state of infrastructure significantly affects the quality of performance reporting (Patience, Nel, 2021). As reported by Burger (2024), the South African Institution of Civil Engineering (SAICE) assigned the country's infrastructure an average rating of D+, signifying it is at risk of failure. The inadequate infrastructure hinders the ability of government institutions to gather and accurately report performance data, as insufficient facilities and resources obstruct effective monitoring and evaluation processes (Chingangacha, Haupt, Awuzie, 2021). In addition, the politicisation of policymaking adds to the difficulties in building capacity (Appiah, Abdulai, 2023).

When policy decisions are driven by political agendas instead of objective performance data, it weakens the establishment of efficient performance reporting systems. This situation can lead to resistance to necessary reforms and a lack of dedication to developing the capacity needed for accurate performance reporting. Notably, performance reporting is a critical factor influencing government institutions' audit results as they strive for an

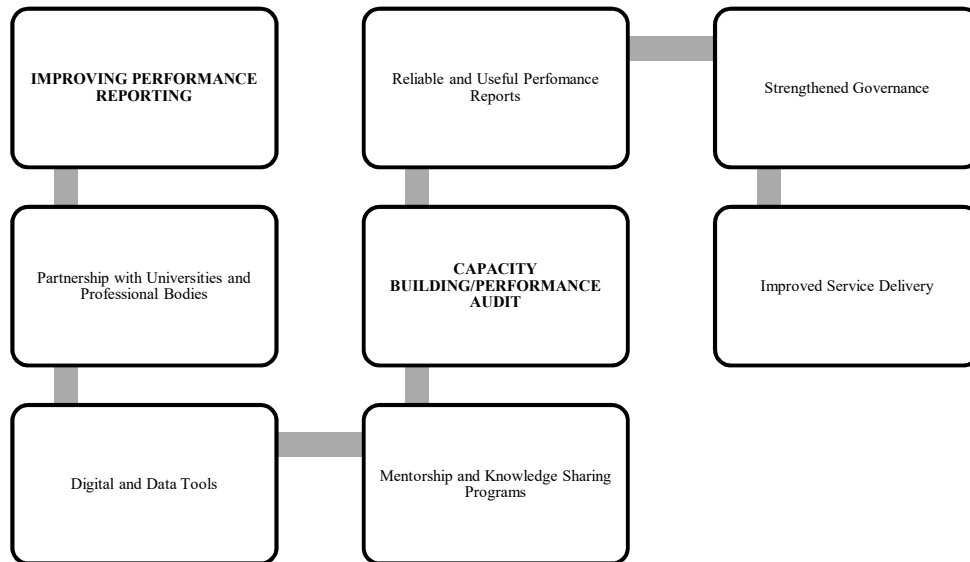
unqualified audit opinion, which should be free of any significant findings in performance reporting. The 2021–2022 report from the Auditor General of South Africa (AGSA) portrayed that, despite the local government having well-structured processes with statutory duties for planning, budgeting, monitoring, and reporting on the execution of municipal functions and integrated development plans (Auditor General of South Africa, 2023), numerous municipalities continually exhibit considerable deficiencies in their performance planning and reporting mechanisms. The AGSA uncovered non-compliance with laws regarding strategic planning and performance management in 45% of all municipalities and in 91% of those with disclaimed audit opinions. In total, 48% of municipal performance reports contained information that was either unhelpful or unreliable.

The consequences of the aforementioned findings suggest that had the AGSA not permitted municipalities to amend the errors found in the submitted performance reports, an even greater number would have released performance reports lacking credibility (Auditor General, 2022). This shows that performance reporting remains an important issue throughout the local government of South Africa. On the other hand, this issue extends to government departments, as the latest 2023–2024 audit report from the AGSA indicates that poorly prepared performance reports, along with substantial corrective measures implemented following the audit, undermine the reliability of mid-year reporting and the effectiveness of performance assessment during the year (Auditor General, 2024). All of this occurs without anyone being held responsible for these actions, which is precisely what Mabizela and Malinga (2025) refer to when they argue that, although South Africa's legal and administrative frameworks provide a solid foundation for municipal accountability, research tends to engage with these mechanisms only at a normative level and fails to adequately explore why they so often break down in practice. It should be emphasized that South Africa has strong and sound policies on paper, but they are not effectively implemented in practice; they exist only as written documents.

Considering the aforementioned issues, South Africa's government needs to find solutions to tackle these challenges across all government levels to guarantee that every institution achieves a clean audit opinion. This is because some government institutions are currently able to obtain an unqualified audit with findings, raising concerns about whether service delivery is truly being prioritised or if the focus is mainly on compliance. An unqualified audit with findings means that, although the financial statements are fairly presented, there are still issues in areas such as performance reporting and compliance (Gcabashe, Pillay, 2025). This suggests that audit outcomes are not always directly linked to actual service delivery performance. For example, reports by the AGSA show that many municipalities receive unqualified audit opinions but still have findings related to weak performance reporting systems, poor data quality, and limited institutional capacity. These challenges highlight gaps in capacity building that affect municipalities' ability to produce reliable performance information and deliver services effectively (AGSA, 2023). Therefore, strengthening capacity building and improving performance reporting systems are essential to ensure that audit outcomes reflect real improvements in service delivery rather than just compliance. This can be done through implementing digital reporting tools and systems, which is one way to ensure the precision and dependability of performance reports. However, Valcheva (2024) supports the view that this fragmented approach might not effectively address the underlying systemic problems affecting performance reporting, potentially resulting in only minor improvements.

### 4.3. Strategies for Strengthening Capacity Building to Enhance Performance Reporting Practices

In the context of performance reporting and capacity building for better service delivery in the South African government, strengthening capacity building is essential to improve the quality, accuracy, and reliability of performance reporting. Effective capacity building ensures that government officials have the necessary skills, knowledge, and tools to collect, analyse, and report performance information that reflects actual service delivery outcomes. Consistent with the article's findings, we as the authors develop and integrate strategies to demonstrate how performance reporting can be enhanced, and the necessary capacity can be built, so that our audit outcomes are strong and effective service delivery is achieved. These strategies have been combined and displayed in a diagram below:



**Figure 1.** Strategies to demonstrate how performance reporting can be enhanced

**Source:** Author's own design.

According to the figure 1, the diagram shows that to improve performance reporting, the government can consider forming partnerships with universities and professional bodies. Such partnerships are essential for addressing capacity gaps in performance reporting as they can provide government staff with access to advanced training modules, contemporary performance management frameworks, and best practices. This can improve government officials' understanding of performance reporting, reducing instances of poor-quality and unreliable data. Moreover, these measures can equip government officials with the knowledge and skills necessary to produce accurate and reliable reports, strengthening governance and accountability. In turn, these partnerships can ensure that the government officials are better prepared to meet the requirements of efficient performance reporting. The second strategy that can be employed is incorporating digital technologies and data analytics into training and reporting processes, which is a critical strategy for improving performance reporting capacity. Digital tools reduce human error, streamline data

collection and analysis, and enhance the accuracy and efficiency of reports (Michael, 2024).

To implement this effectively, the government must invest in ICT infrastructure, as recommended by Nkgapele (2024), to support the full integration of digital systems into public service operations. Technological integration promotes a culture of data-driven decision-making, improves the reliability and usefulness of performance information, and improves overall service delivery. This will, in turn, lead to successful capacity/human resources, which can report accurate, reliable, and useful performance information. The government can also consider establishing mentorship programs and knowledge-sharing platforms, which will provide them with a chance to learn from those government institutions that are performing well in performance reporting. Zamiri and Esmaeili (2024) indicate that this strategy provides a practical mechanism to address skills gaps and build institutional memory. Through transferring expertise and best practices, these initiatives foster continuous learning and improvement, ensuring that performance reporting aligns with strategic goals. Embedding mentorship and knowledge-sharing within broader government reforms supports sustainability and reinforces institutional capacity. For instance, South Africa's Capacity Development Strategy emphasises coordinated efforts to enhance public financial management capabilities (National Treasury, Nd). This will further improve and strengthen governance and service delivery in government.

## 5. CONCLUSIONS

The article indicates that effective performance reporting and capacity building are fundamental to improving service delivery in the South African government and are directly aligned with the objectives of the National Development Plan 2030, particularly the goal of building a capable, developmental, and accountable state. This perspective is strongly grounded in Human Capital Theory, which emphasises that investment in education, skills development, and training enhances the productivity and performance of individuals within organisations. In the context of the NDP, strengthening the skills and competencies of public servants is essential to developing a professional public administration capable of delivering efficient, responsive, and citizen-centred services. Ensuring accurate, reliable, and timely performance reporting is therefore highly dependent on the availability of well-trained and competent human resources. Skilled personnel play a critical role in maintaining the integrity, precision, and credibility of performance data, which is essential for informed decision-making, accountability, and the achievement of the NDP's service delivery and governance targets.

However, performance reporting within the South African government continues to face persistent challenges that undermine its contribution to service delivery. These challenges include limited administrative and technical capacity, inconsistent utilisation of digital reporting systems, inadequate ICT infrastructure, and weaknesses in institutional processes. From a Human Capital Theory perspective, these challenges reflect insufficient investment in the development of employees' skills and competencies, resulting in fragmented, delayed, or unreliable reporting. Consequently, this affects transparency, governance, and the government's ability to respond effectively to citizens' needs. To strengthen the link between performance reporting and improved service delivery, a holistic and strategic capacity-building approach is required. In line with Human Capital Theory, this approach should prioritise continuous learning and skills enhancement through targeted training and development programmes in partnership with academic and



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Aneta PTAK-CHMIELEWSKA<sup>1</sup>  
Małgorzata GRZYWIŃSKA-RĄPCA<sup>2</sup>

## DETERMINANTS OF HOUSEHOLD SAVING IN SELECTED EUROPEAN COUNTRIES: ANALYSIS OF OBJECTIVE ECONOMIC FACTORS AND SUBJECTIVE EVALUATIONS

Household savings remain one of the key areas of economic research, particularly in view of the growing importance of subjective assessments of financial situations alongside traditional objective indicators. The aim of the study is to construct a simplified consumer confidence indicator and to evaluate its ability to explain differences in the household saving rate across EU countries. Eurostat data for the years 2000–2022 were used; principal component analysis (PCA) was applied to select the components, while the k-means method was used to classify countries. Out of the twelve components of the original Consumer Confidence Indicator (CCI), six variables most strongly associated with the first principal component were identified. The new indicator shows a high level of consistency with the original CCI ( $r = 0.70–0.93$ ), and its relationship with the saving rate is moderately strong ( $r = 0.4–0.5$ ). Combining objective and subjective measures of financial conditions allows for more accurate predictions of saving behavior than using either of these measures separately. The indicator may serve analytical institutions, central banks, and policymakers as a simple yet reliable alternative to the full CCI.

**Keywords:** Consumer Confidence Index, household saving, European countries, subjective determinants of household saving.

### 1. INTRODUCTION

Households' perceptions of the economic situation, employment and their own financial situation, including their propensity to save, are reflected, among other things, in the Consumer Confidence Index (Juhro, Iyke, 2020; Matošec, Obuljen Zoricic, 2019; Ferrentino, Vota, 2023). At the same time, it plays an important role in macroeconomic

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<sup>1</sup> Aneta Ptak-Chmielewska, Warsaw School of Economics, Poland; e-mail: aptak@sgh.waw.pl. ORCID: 0000-0002-9896-4240.

<sup>2</sup> Małgorzata Grzywińska-Rąpca, University of Warmia and Mazury in Olsztyn, Poland; e-mail: malgo@uwm.edu.pl (corresponding author). ORCID: 0000-0003-2088-2795.

analysis in the context of the influence of subjective assessments of the economic situation on consumers' decisions to spend, invest or save (Grzywińska -Rapca, 2023; Nanda, Banerjee, 2021). Savings are not only a safety net for unforeseen expenses or emergencies, but also a tool for long-term financial goals such as buying a home, education or retirement. In times of dynamic economic change and market uncertainty, the importance of savings becomes even clearer. It remains closely linked to households' perceptions of financial security and their expectations of future economic conditions (Joo, Grable 2004; Dudek 2013; Głowicka-Wołoszyn, Wołoszyn 2014; Grzywińska-Rapca 2021). Perception includes confidence in the stability of income, the ability to meet current expenses and the ability to meet future financial obligations (Hampson et al., 2021; Vanlaer et al., 2020). In addition to the stability of employment or the level of debt, the perception of households' financial security is influenced by the expectation of future economic conditions. This has a significant impact on individuals' financial decisions. Awareness of one's own perceptions of financial security and an understanding of the impact of future economic conditions on one's financial situation allow for more effective planning and implementation of financial goals. In a rapidly changing world where economic uncertainty is commonplace, the ability to adapt and consciously manage one's savings is critical to ensuring one's stability and financial security.

Household savings rates are strongly influenced by the Consumer Confidence Index (CCI). A high level of the CCI tends to encourage a higher propensity to spend, which can lead to lower levels of saving (Kłopocka, Górka, 2021; Vanlaer et al., 2020; Grzywińska-Rapca, Ptak-Chmielewska, 2023). Conversely, low confidence often has the opposite effect, as consumers become more cautious and tend to build up financial reserves. Higher assessments of the economic situation of households lead to a higher CCI, which in turn affects household saving rates. Research suggests (Başarir, 2022) that consumer confidence has predictive power for future household savings rates and that combining objective and subjective assessments allows for more accurate predictions of household financial behaviour.

The empirical analysis conducted aims to determine the strength and direction of the relationship between the level of different household financial resources (financial assets, their diversification and debt) and households' subjective assessments of their financial situation, taking into account their heterogeneity.

The results can help to complement research in the area of social comparisons by examining the impact of a household's objective financial situation as captured by other non-income measures. Among the existing studies identifying the impact of individual income on subjective assessments of household financial position, the work of Boyce, Brown and Moore (2010) and Clark, Westergård-Nielsen and Kristensen (2009).

The main objectives of the study are (1) to construct a new synthetic indicator based on objective economic factors and subjective assessments of the financial situation of European households, (2) to examine the relationship between the synthetic indicator and the level of savings of European households and (3) to group countries on the basis of the new CCI index and household savings. With regard to the main objective, the specific objectives of the study are the following

1. to identify objective factors in the area of household financial well-being,
2. to identify the impact of subjective determinants on financial behaviour,
3. to identify and profile country segments on the basis of differences in the level of savings and the subjective assessment of the material and financial situation of households.

The analysis carried out is intended to help fill a potential gap in the analysis of the determinants of financial satisfaction and subjective well-being, as well as comparative effects on overall life satisfaction. Although it is clear that the variables used for analysis are correlated, they may capture different aspects of individual evaluations. It is important to carry out the analyses in the selected years.

## 2. LITERATURE REVIEW

### 2.1. Determinants of household saving

Household savings are a key element of financial stability, both for individuals and for the economy as a whole (Karwowska, Piekut, 2024; Levenko, 2020; Zawadzka, Grzywińska-Rapca, 2021; Amari, et al., 2020). Their level is influenced by a number of factors that determine the ability and willingness to save for the future. Among the objective factors determining changes in household saving behaviour, household income, the level of expenditure and the cost of living are the most frequently cited, but also interest rates and the availability of financial instruments (Table 1).

Table 1. Determinants of household financial behaviour

Determinant	Characteristics
Objective factors	
Household income	<i>Income level:</i> Higher incomes allow more savings to be made, while lower incomes limit the ability to put money aside. <i>Income stability:</i> Stable incomes encourage regular saving, while instability (e.g. temporary work) reduces the propensity to save.
Expenditure levels and cost of living	Increases in the cost of living, such as the price of food, energy or services, reduce the surplus income available for saving.
Interest rates and availability of financial instruments	High interest rates encourage saving in banks and other financial institutions by offering attractive returns. The availability and variety of financial products (e.g. savings accounts, deposits, investment funds) make it easier to put money aside.
Inflation	High inflation reduces the real value of savings and can discourage accumulation unless indexation mechanisms are in place. Stable prices promote greater confidence in saving.
Fiscal policy and regulation	Taxes on savings, tax exemptions for savings products and programmes that encourage saving (e.g. pension relief) influence saving decisions. Social programmes can reduce the need to accumulate private savings for social security purposes.
Labour market situation	Low unemployment and job stability increase the sense of security and the propensity to save. The threat of losing one's job leads to greater caution and the desire to create a so-called "financial cushion".

Table 1 (cont.). Determinants of household financial behaviour

Determinant	Characteristics
Subjective factors	
Financial attitudes and beliefs	Households that perceive saving as important and valuable are more likely to put money aside regularly. Optimism or pessimism about the future financial situation influences the propensity to save.
Motivations and goals	<i>The purpose of saving:</i> Specific goals such as buying a home, children's education, retirement or travel are strong motivators for saving. <i>Sense of security:</i> People who value financial security are more likely to build up a financial reserve.
Attitude to risk	<i>Risk aversion:</i> Risk-averse individuals may prefer traditional forms of saving (e.g. savings accounts), while risk-taking individuals may invest, which also affects their savings strategies. <i>Fear of the unexpected:</i> Fear of future financial difficulties (e.g. job loss, health crisis) can lead to higher savings.
Confidence in the future	<i>A sense of stability:</i> An optimistic view of the future encourages greater investment and savings. <i>Economic uncertainty:</i> Fear of economic instability can lead to greater accumulation of savings as a form of security.

Source: own elaboration based on (Grzywińska-Rapca, 2021).

Higher incomes enable households to cover current expenses and generate financial surpluses that can be used for saving. Regular saving is also encouraged by stable and predictable sources of income. Households with people on permanent contracts have greater financial security, which encourages them to plan and set aside funds (Kulpaka, 2013). In contrast, income instability, such as that resulting from temporary contracts or self-employment, reduces the propensity to save due to the uncertainty of future income. Savings models (Grzywińska-Rapca, 2021) show that increases in the cost of living, such as the price of food, energy or services (caused, for example, by inflation), have a direct impact on household budgets. As a result, higher household consumption expenditure reduces surplus financial resources.

Objective factors determining the level and structure of saving include interest rates (impact on the level of saving) and the availability of financial instruments (structure of saving). High taxation on capital gains can act as a disincentive to saving. On the other hand, tax relief on savings products, such as individual pension accounts (e.g. in Poland), can provide an incentive to set aside funds for the future.

Low unemployment and stable employment are cited as factors that increase a sense of financial security, which is conducive to saving. The instability of the labour market and the associated risk of losing one's job may determine the financial behaviour of households to increase the level of savings aimed at financial security for the future.

Household saving is thus the result of a complex interaction of many economic, social and psychological factors (Table 2).

Table 2. Comparison of the impact of objective and subjective factors on households' propensity to save

Specification	Objective factors	Subjective factors
Nature and measurability	They are measurable and give rise to specific, external considerations (e.g. income, inflation, interest rates).	They arise from internal beliefs, emotions, attitudes and psychological characteristics that are harder to measure and more individual.
Directness of impact	They work in a more direct and universal way. For example, an increase in income increases the ability of most households to save.	They act in a more individualised way. For example, two people with similar incomes may have different approaches to saving due to differences in risk perception or consumption preferences.
Universality vs. individualisation	They are more universal in nature and affect the whole population in a similar way, although differences may be due to income level or life cycle stage.	They are highly individual and vary from person to person or family to family.
Influence of external situations	They are strongly linked to the macroeconomic situation (e.g. recession, economic growth, interest rates).	They are more resilient to external changes. Those with established financial habits can continue to save even in difficult economic conditions.

Source: own elaboration based on (Grzywińska-Rapca, 2021; Kulpaka, 2013; Grzywińska-Rapca, Ptak-Chmielewska, 2023).

Understanding the determinants presented (Table 2) can be key to developing effective financial strategies at both the individual and the government level. Promoting savings through financial education, favourable regulation and stable economic policies can contribute to social welfare and economic stability.

## 2.2. Link index of consumer confidence and household savings

The consumer confidence index is one of the most important indicators of households' perceptions of the current and future economic situation. Its importance goes beyond its function as a simple sentiment barometer, as it influences consumers' actual economic decisions, such as spending, investing or saving (Kulpaka, 2013; Banaszczak-Soroka, Pancer-Cybulska, 2021). In particular, the savings rate, which is a measure of the share of income spent on capital accumulation, is sensitive to both the direct impact of changes in sentiment and the broader macroeconomic context, which the confidence index helps to reflect.

Analysis of the relationship between the consumer confidence index and the level of savings can show how changes in consumer sentiment affect their financial decisions and identify factors that alter this relationship. Research on the relationship between the CCI and the savings rate provides insight into the mechanisms that govern consumer behaviour in different economic conditions (Table 3).

Table 3. Example studies of the relationship between the consumer confidence index and the savings ratio

Author/Year	Aim of the study	Conclusion
Vanlaer et al., (2020)	Analysis of the impact of consumer confidence on household saving behaviour in the EU.	Confidence in the financial situation of households has a stronger impact on household saving than confidence in the general economic situation. The impact of consumer confidence on household saving increased after the crisis.
Grzywińska-Rapca, Ptak-Chmielewska (2023)	Analysis of the impact of retrospective versus prospective assessments on the CCI	Higher respondent expectations lead to a higher CCI. The differences in respondents' assessments between countries are significant.
Basarir (2022)	The study examines the relationship between consumer confidence and savings.	The trend towards austerity measures is having a positive impact on consumer confidence in the short term.
Kłopotcka (2017)	Analysis of the impact of consumer confidence on household saving and borrowing behaviour.	Consumer confidence predicts household saving and borrowing behaviour. Combining objective and subjective indicators improves the prediction of financial behaviour.
Akbar et al., (2022)	Analysis of the relationship between the CCI and the household saving rate	The CCI is positively related to the household saving rate.

Source: own elaboration.

The direct effect of the index on the saving rate can be observed in consumers' decisions to accumulate money in response to changes in their optimism or pessimism (Olszewska, 2023). When confidence is high, consumers are more inclined to spend, which can reduce the saving rate. Conversely, a fall in confidence encourages financial prudence and an increase in savings.

An indirect effect comes from the index's impact on other macroeconomic factors, such as economic growth, employment levels or credit availability. For example, a high index may favour a better economy, which in turn changes the structure of household spending and saving. The relationship between the consumer confidence index and the saving rate is shown in Table 4.

The consumer confidence index can have a significant impact on the household savings rate, but the relationship is complex and depends on many economic, social and political factors. Analysing this impact requires taking into account the context and other variables that influence consumer decisions.

Household financial management has been the subject of many studies, but the analyses have mostly focused on income levels and spending patterns, without taking into account the non-economic factors highlighted by behavioural economists.

Table 4. Relationship between consumer confidence index and savings ratio

Specification	Characteristics
Relationship between CCI and consumption expenditure	When the consumer confidence index is high, consumers are more likely to spend money, which can lead to a lower savings rate.
Expectations of future income	If consumers are optimistic about future do-gooders, they may be more inclined to spend their current financial resources, reducing the savings rate.
Stability of employment	High levels of consumer confidence often correlate with a sense of job and income stability, which can lead to higher spending and a lower propensity to save.
Monetary and fiscal policy	The consumer confidence index can also be affected by government policies and central bank actions that affect the economy. For example, interest rate cuts can boost consumer confidence and encourage more spending, while increases can discourage spending and increase savings.
Response to economic change	Consumer confidence often reacts to changes in the health of the economy, such as GDP growth, unemployment levels and inflation. High levels of these indicators can reduce the savings rate, while negative economic developments can lead to an increase.

Source: own elaboration based on (Grzywińska-Rapca, 2021; Kulpaka, 2013; Grzywińska-Rapca, Ptak-Chmielewska, 2023; Grzywińska-Rapca, Markowski, 2023).

### 3. METHODOLOGY

#### 3.1. data sources

The data used in the analysis come from harmonised surveys of the economies of the European Union, published by Eurostat. These surveys are carried out at national level by partner institutions such as ministries, statistical offices, central banks and research institutes. EU and euro area aggregates are calculated on the basis of the national results.

The sample size of each survey varies from country to country according to the heterogeneity of their economies and is linked to the size of their population. Across the EU, around 32,000 consumers are interviewed each month. In order to make the sample more efficient (smaller sample for a given level of precision), consumer surveys are stratified, taking into account respondent characteristics such as gender, age, education, income and region of residence.

For the analysis, sub-indexes of the consumer confidence index were used, reflecting different aspects of perceptions of the economic and financial situation. These sub-indexes allow an in-depth analysis of the factors influencing the overall level of consumer confidence, as well as identifying differences in sentiment across social, demographic and economic groups. The main indicators that make up the consumer confidence index are discussed below (Table 5).

Table 5. The main indicators that make up the Consumer Confidence Index

Sub-index	Characteristics
Current Economic Situation Indicator	Refers to consumers' assessment of the current economic situation in the country. Consumers assess whether the economic situation has improved, worsened or remained the same compared with the previous month.
Economic expectations index	Reflects consumers' expectations about the future health of the economy. This indicator provides information on the possible direction of changes in household consumption and investment.
Household current financial situation index	It focuses on assessing consumers' current financial situation. Provides an understanding of the extent to which consumers are able to meet their financial and savings needs.
Household financial situation expectation index	Measures consumers' optimism or pessimism about their future financial situation. It is an important element in analysing the propensity to save or spend in the short term.
Purchase propensity index	It assesses consumers' willingness to make major expenditures, such as buying cars, white goods or investing in property.
Labour market perceptions index	It analyses the subjective assessment of the labour market situation, including the possibility of finding a job and the level of security of the current job.
Inflation indicator	Reflects consumers' perceptions and expectations of future price increases.
Savings indicator	Determines consumers' ability and willingness to save.

Source: own elaboration based on [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Construction\\_producer\\_price\\_and\\_construction\\_cost\\_indices\\_overview](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Construction_producer_price_and_construction_cost_indices_overview) [17.07.2024].

Each sub-index brings a unique perspective to the analysis of consumer sentiment and their differentiation allows a more detailed understanding of the structure and dynamics of the CCI. The indices used to construct the CCI include two types of assessments: retrospective (relating to the past 12 months) and prospective (relating to expectations for the next 12 months).

The published CCI values are balances, calculated as the difference between positive and negative responses, measured as percentage points of all responses.

Specifically, if a question has three alternatives: positive (P) (up, more, more than enough, good, too much, increase, improve, etc.), neutral (E) (unchanged, same, sufficient, satisfactory, adequate, etc.) and negative (M) (down, less, not enough, too little, decrease, etc.), and negative (M) (down, less, not enough, too little, decrease, etc.), where P, E and M (where  $P + E + M = 100$ ) represent the percentage of respondents who chose positive, neutral and negative respectively, the balance is calculated as  $B = P - M$ .

Seasonally adjusted data for 12 indicators were used for statistical analysis:

- x1 – Financial situation in the last 12 months
- x2 – Financial situation for the next 12 months
- x3 – General economic situation in the past 12 months

- x4 – General economic situation in the next 12 months
- x5 – Price development in the last 12 months
- x6 – Expectations for prices in the next 12 months
- x7 – Unemployment expectations for the next 12 months
- x8 – Current economic situation suitable for major purchases
- x9 – Expectations for major purchases in the next 12 months
- x10 – Current economic situation suitable for saving
- x11 – Saving in the next 12 months
- x12 – Assessment of household's financial situation

The Customer Confidence Index (CCI) data cover 33 countries: Albania, Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Montenegro, Netherlands, Northern Macedonia, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Turkey, United Kingdom.

### 3.2. Research methods

The analysis used multivariate statistical analysis methods based mainly on taxonomic methods, such as the principal components method to determine the new version of the consumer confidence index, and the cluster analysis (clustering) method using the k-means method to group the countries analysed. The methods used allow the research objectives formulated in the study to be achieved.

The principal components method was used to construct a new version of the consumer confidence index using principal components analysis (PCA). The principal components method used a correlation matrix and varimax orthogonal rotation of factors to determine the coefficients of the linear combination of variables. The linear combination of variables and the coefficients provide information about latent unobservable factors in the data. The coefficients provide information about the contribution of each variable to the factor, with the sign indicating the direction of the correlation between the variable and the factor. This information allows for the interpretation of individual latent factors (Panek, Zwierzchowski, 2013).

The classic Pearson's linear correlation coefficient was used to assess the strength and direction of the relationship.

$$r_{xy} = \frac{Cov(x,y)}{S(x) \cdot S(y)} \quad (1)$$

where:

- Cov(x,y) is the covariance between features x and y,
- S(x), S(y) is the standard deviation of the characteristics x and y.

Pearson's linear correlation coefficient takes values in the range [-1;1]. The higher the coefficient value, the stronger the correlation; the sign indicates the direction of the relationship. Coefficient values above 0.7 indicate a strong correlation, while values between 0.4 and 0.6 indicate a moderate correlation.

The k-means method was used to group countries. The k-means method is the most commonly used method in cluster analysis. The Euclidean distance determines the similarity distance between units (countries) based on selected characteristics of the grouped units. The number of groups is determined arbitrarily at the beginning of the analysis and then random seeds are chosen as the centres of the groups. Each observation

( $i=1, \dots, n$ ) is assigned to the group with the closest centroid (seed). The distance is measured by the Euclidean distance. For all groups ( $j=1, \dots, k$ ), new centroids are determined as the arithmetic mean of the distances from the centroid of all observations belonging to the group. The steps are repeated until there are no more shifts between groups. The error function is determined at each step – the sum of the squares of the distances from the centroids within the group (Frątczak ed., 2009):

$$F = \sum_{j=1}^k d(O_i, M_j) \quad (2)$$

where:

$d$  – Euclidean distance,

$O_i$  – Centre of gravity of the  $i$ -th group,

$M_j$  – Observations (units clustered)  $j=1, \dots, k$ .

In practice, this process converges after a few iterations, but in general the algorithm does not need to reach convergence, so a maximum number of iterations is defined in this process.

## 4. RESULTS

### 4.1. Consumer confidence index vs. household savings

The Consumer Confidence Index (CCI) plays a key role in determining household savings rates. Higher assessments of the economic situation of households, both retrospectively and prospectively, are reflected in higher CCI values. Positive perceptions of the financial situation increase consumer optimism, which can have a direct impact on savings decisions. Empirical studies show that consumer confidence is an important predictive tool for analysing future savings rates. By taking into account both objective economic factors, such as income levels, interest rates or unemployment rates, and consumers' subjective assessments, it is possible to model household financial behaviour more accurately. In this way, the CCI becomes not only an indicator of the current economic situation, but also a tool for forecasting savings trends. Savings play a fundamental role as a buffer against the adverse effects of unexpected economic events and as a source of capital for investment. However, saving decisions depend on a number of factors, including income levels, fiscal and monetary policies and individual expectations about the future of the economy.

In this context, the CCI becomes a particularly valuable analytical tool. By monitoring it, it is possible to understand the dynamics of changes in consumer behaviour and the impact of these changes on overall financial stability. Consumer optimism associated with high CCI values can lead to a reduction in the propensity to save in favour of consumption, which may stimulate the economy in the short term but undermine the level of capital accumulation in the long term. Conversely, a fall in consumer confidence may lead to an increase in savings as a defensive response, which may reduce consumption but also strengthen financial stability within households. The consumer confidence index is therefore an important indicator in the analysis of household financial behaviour. Its role in predicting saving rates stems from its ability to combine objective and subjective assessments, thus providing a better understanding of consumer decision-making mechanisms and their impact on the economy. During the period of growth of the CCI index between 2012 and 2019, an increase in savings can also be observed, although this increase shows less dynamism compared to the changes in the CCI (Figure 1).

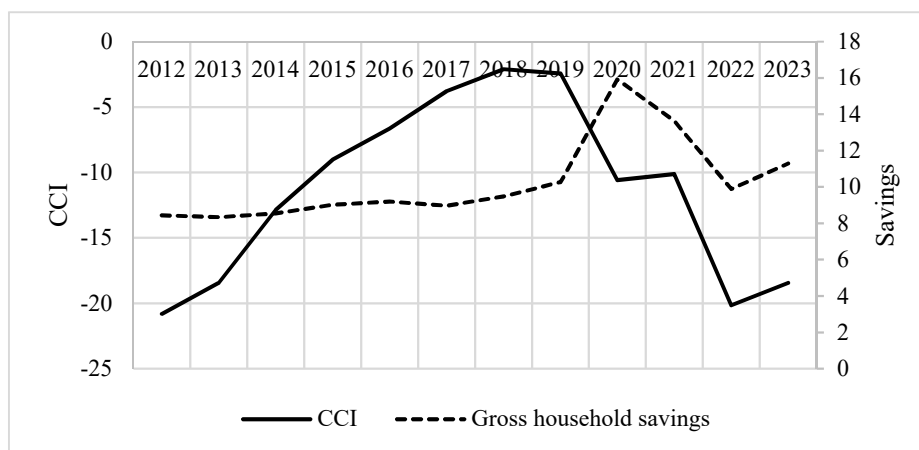


Figure 1. Consumer Confidence and Household Savings Index – Average for EU and selected Candidate Countries (2012–2023)

Source: own elaboration.

Between 2012 and 2018, the Consumer Confidence Index (CCI) has gradually increased, indicating an improvement in consumer sentiment. The CCI value rises from around -20 in 2012 to almost -5 in 2018. Over the same period, household savings remain stable, with a slight increase in 2016 and 2017. In the following period (2018–2020), the CCI peaks in 2019, indicating the highest level of consumer optimism in the period 2012–2023. In 2020, there is a sharp decline in the CCI, which may be linked to global economic turbulence (e.g. the COVID-19 pandemic). The savings rate peaks in 2020. This change is likely to be due to consumers being more cautious about consumption spending during a pandemic. The values for both the level of the CCI and the savings rate from 2020 to 2023 show that the CCI remains at a low level from 2020 to 2022, with a minimal increase towards the end of the period. The rate has not returned to pre-crisis levels. Savings, on the other hand, initially decrease in 2021, but increase again from 2022 onwards, although they do not reach the level of 2020. The data presented (Figure 1) may suggest a relationship between CCI and savings. In periods of high consumer optimism (high CCI), savings are lower, suggesting a greater propensity to spend. Conversely, during periods of low CCI (e.g. during a pandemic), savings increase, indicating more cautious consumer behaviour. Fluctuations in both indices reflect the impact of economic and social events on households.

#### 4.2. Proposal for a new CCI consumer confidence index

The proposal for a new consumer confidence index CCI was estimated using data for 2000–2022. For 2023, the new CCI was recalculated with the new weights. The principal component method was used to select only relevant factors. A strong correlation of the factor with the principal component served as a selection criterion. The eigenvector corresponding to the first eigenvalue was expressed in terms of correlation coefficients. The selection of variables for the new consumer confidence index was based on correlation coefficients above 0.7 (strong correlation). A variable was selected if for at least 50% of the observation periods (years) the correlation coefficient with the first principal

component was above 0.7. The weights for the variables were determined as a share of the sum of all correlation coefficients for the selected variables (Table 6).

Table 6. Selection of variables for the New Consumer Confidence Index

Number of periods with high correlation $r > 0.7$	Average correlation coefficient	Share of total (Total=4.80)	Variables
23	0.92	19.1%	x1
23	0.86	18.0%	x2
16	0.73	15.1%	x3
18	0.74	15.5%	x8
21	0.81	16.8%	x11
17	0.74	15.5%	x12

Source: own elaboration.

The correlation coefficient between the CCI and the proposed new CCI was in the range of 0.70-0.93 for the period 2000-2022, which can be considered as a strong correlation. The time trend of the new consumer confidence index is similar to the time trend of the existing consumer confidence index. Variables x1 and x2 have the highest number of periods with a strong correlation. Both variables have the highest significance in the context of the analysis, which may indicate that they are most closely related to the phenomenon under study. The highest average correlation coefficient was obtained for the variables x1 (0.92) and x2 (0.86), making them the most significant variables. The variables x3, x8, x11, x12 are of lesser importance, but their impact is significant enough not to be excluded from the analysis. Of particular note is x11, which has a high correlation coefficient and a large contribution to the total. Based on a statistically valid selection of variables, the new consumer confidence index includes x1 (financial situation in the last 12 months), x2 (financial situation in the next 12 months), x3 (general economic situation in the last 12 months), x8 (current economic situation is suitable for major purchases), x11 (savings in the next 12 months) and x12 (assessment of household financial situation). The values of the New Consumer Confidence Index (New CCI) for 2023 are shown in Figure 2.

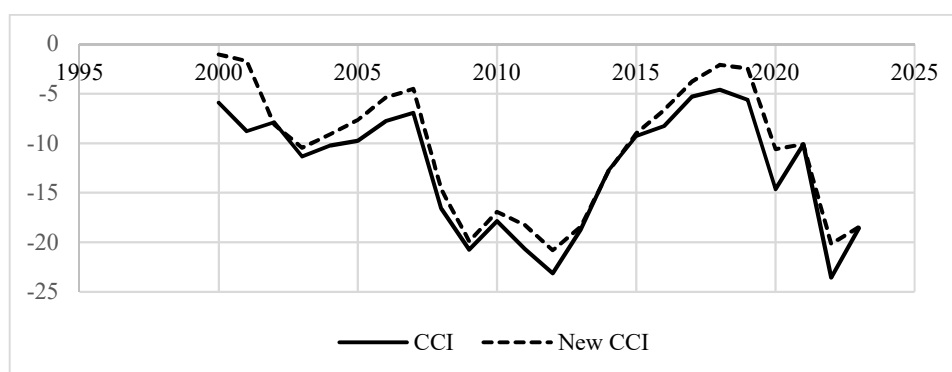


Figure 2. CCI and New CCI index from 2000 to 2022

Source: own elaboration.

Between 2009 and 2012, i.e. during the financial crisis in Europe, a sharp decline in the consumer confidence index was observed. A similar low level of the CCI is observed between 2020 and 2023, i.e. during the COVID-19 pandemic.

The dependence of the new CCI on household savings for selected years is shown. The years 2018, 2020 and 2022 have been analysed in detail. 2018 is the last full year before the pandemic, this year is characterised by a high CCI and low savings (Figure 1 and Figure 3), the correlation is moderately strong with  $r = 0.48$ . 2020 is the first year during the pandemic, it is characterised by a low CCI and still high savings, the correlation is moderately strong with  $r = 0.49$  (Figure 1 and Figure 4). The year 2022 is the last year of the pandemic with access to complete data after the 'lock down' is lifted, this period is characterised by a very low consumer confidence index and very low savings, the correlation is moderately strong at  $r = 0.40$  (Figure 1 and Figure 5). The presence of two outlier observations in 2022 is noteworthy. The outliers are Turkey and Greece (Figure 5).

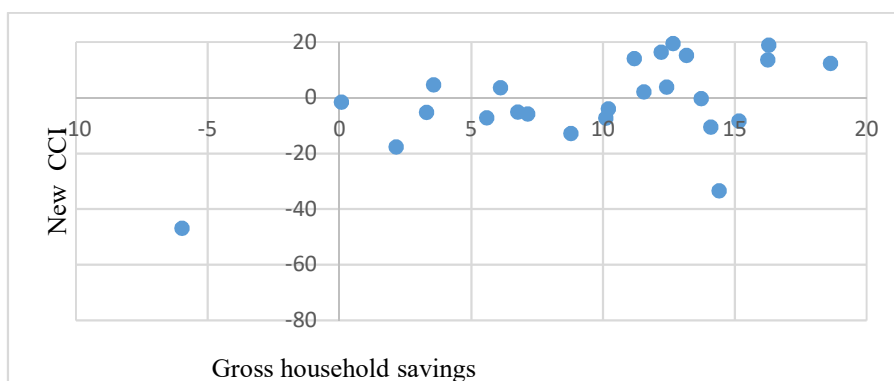


Figure 3. Correlation between the new CCI and household savings (2018)

Source: own elaboration.

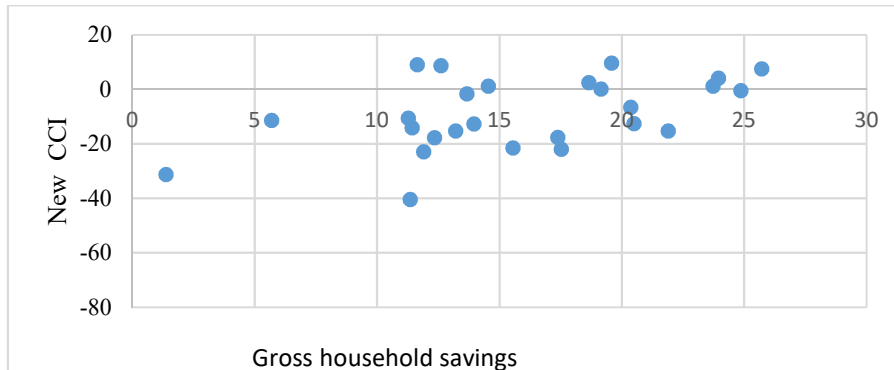


Figure 4. Correlation between the new CCI and household savings (2020)

Source: own elaboration.

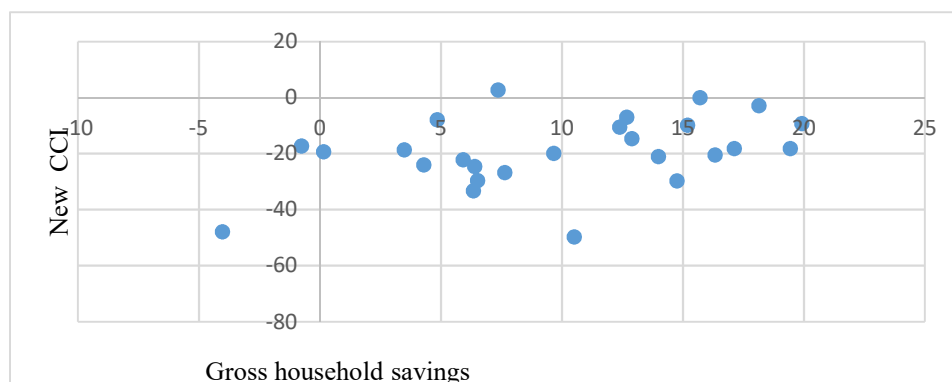


Figure 5. Correlation between the new CCI and household savings (2022)

Source: own elaboration.

#### 4.3. New CCI Index and savings in clusters of selected countries

Clustering the selected countries into three clusters using the k-means method (missing savings data concerned Bulgaria, Romania, Malta, the United Kingdom, Montenegro and Albania; these countries were not included in the analysis) resulted in one large cluster containing 16 countries in 2018, one cluster containing 9 countries and one outlier cluster containing only one country that was found to be dissimilar to any other cluster (Table 7).

Table 7. New CCI index and household savings – descriptive statistics for clusters (2018)

Cluster	I		II		III	
Cluster elements	Greece		Spain, Croatia, Italy, Cyprus, Latvia, Lithuania, Poland, Portugal, Serbia		Belgium, Czech Republic, Denmark, Germany, Estonia, Ireland, France, Luxembourg, Hungary, Netherlands, Austria, Slovenia, Slovakia, Finland, Sweden, Turkey	
Variable	New CCI	Savings	New CCI	Savings	New CCI	Savings
Mean	-46,88	-5,97	-6,43	5,27	6,50	13,02
Deviation std.			6,29	3,25	15,08	2,86
Min	-46,87	-5,97	-17,60	0,08	-33,43	7,21
Max	-46,88	-5,97	4,64	10,10	22,43	18,63
Q1	-46,88	-5,97	-7,23	3,31	-2,12	11,37
Median	-46,88	-5,97	-5,82	5,59	13,01	12,90
Q3	-46,88	-5,97	-5,08	7,14	17,65	14,78

Source: own elaboration.

The outlier was Greece, with an extremely negative consumer confidence index and a negative household saving rate. Cluster two included countries such as Spain, Croatia, Italy, Cyprus, Latvia, Lithuania, Poland, Portugal and Serbia. These are countries with an average negative consumer confidence index of -6.4 and an average positive moderate

saving rate of 5.27. The last most numerous cluster is a group of countries: Belgium, the Czech Republic, Denmark, Germany, Estonia, Ireland, France, Luxembourg, Hungary, the Netherlands, Austria, Slovenia, Slovakia, Finland, Sweden and Turkey. This cluster is characterised by the highest average level of the consumer confidence index, at +6.5, and the highest saving rate, at an average of 13.02. This group of countries is also the most dispersed in terms of the consumer confidence index (Figure 6).

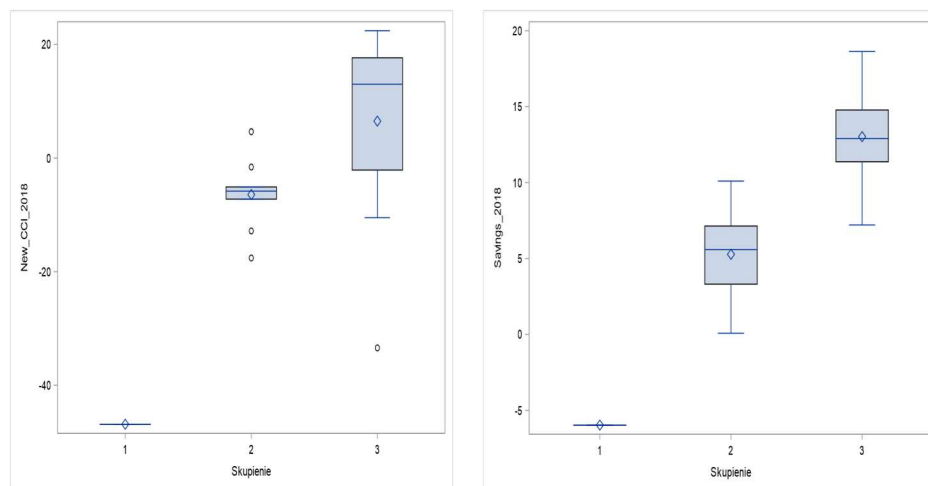


Figure 6. New CCI index and household savings in clusters (2018)

Source: own elaboration.

Table 8. New CCI index and household savings – descriptive statistics for clusters (2020)

Cluster	1		2		3	
Cluster elements	Estonia, Spain, Croatia, Italy, Cyprus, Latvia, Lithuania, Poland, Slovakia, Serbia		Belgia, Czechy, Dania, Niemcy, Irlandia, Francja, Luksemburg, Holandia, Austria, Słowenia, Finlandia, Szwecja		Greece, Hungary, Portugal, Turkey	
Variable	New CCI	Savings	New CCI	Savings	New CCI	Savings
Mean	-20,96	4,81	-10,72	15,09	-40,11	6,89
Deviation std.	6,02	3,21	7,99	3,52	10,11	8,05
Min	-29,53	-0,77	-21,02	7,36	-49,66	-4,03
Max	-7,80	9,66	2,80	19,91	-29,68	14,75
Q1	-24,54	3,48	-18,09	12,77	-48,75	1,15
Median	-20,95	5,38	-10,14	15,45	-40,55	8,42
Q3	-18,62	6,51	-4,89	17,63	-31,47	12,62

Source: own elaboration.

Based on the Consumer Confidence Index data and the level of household savings in 2020, two clusters of similar size were obtained with 10 and 12 countries respectively. In addition, the third cluster included only four countries, with Greece being joined by Hungary, Portugal and Turkey.

Cluster one with 10 countries: Estonia, Spain, Croatia, Italy, Cyprus, Latvia, Lithuania, Poland, Slovakia and Serbia. This is a group of countries characterised by a very low average consumer confidence index of -20.96 and the lowest average saving rate of 4.81 (Table 8 and Graph 7).

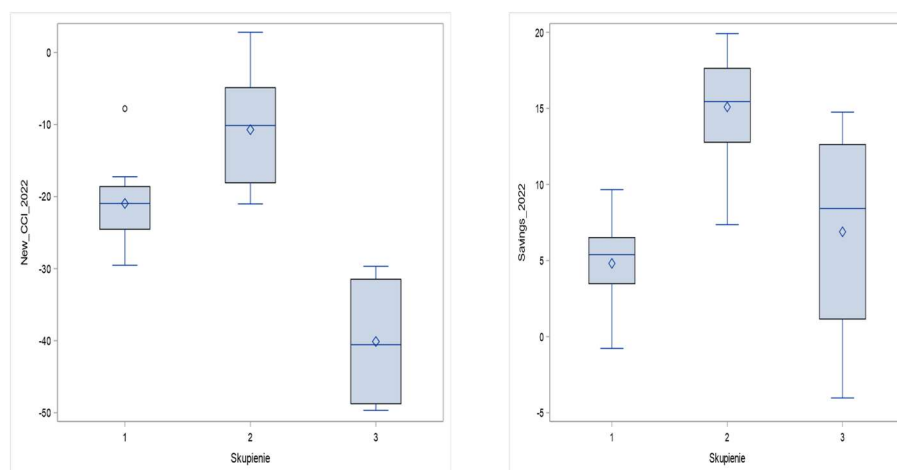


Figure 7. New CCI index and household savings in clusters (2020)

Source: own elaboration.

Cluster two out of 12 countries are Belgium, the Czech Republic, Denmark, Germany, Ireland, France, Luxembourg, the Netherlands, Austria, Slovenia, Finland and Sweden. This is the group of countries with an average Consumer Confidence Index of -10.72, the highest this year, and the highest average savings rate of 15.09. In the third cluster, where only four countries were included, the lowest extreme of the consumer confidence index -40.11 and a low average savings rate of 6.89 were observed.

## 5. DISCUSSION

The results of the analyses carried out indicate a moderate relationship between the Consumer Confidence Index (CCI) and the household saving rate. The correlation coefficient in the selected years (2018, 2020, 2022) was in the range of 0.40-0.50, indicating a significant relationship but not a clear determinant of household saving behaviour.

In the period before the COVID-19 pandemic (year 2018), high CCI values and relatively low savings levels were observed, confirming that higher consumer optimism leads households to spend more at the expense of accumulating savings. During the pandemic (year 2020), when the CCI reached significant declines, household savings increased. This result can be attributed to more cautious consumer attitudes and a reduction in consumption due to lockdowns and economic uncertainty. In 2022, despite a persistently

low CCI, savings declined, possibly as a result of rising inflation and other adverse macroeconomic conditions.

A breakdown of countries using the k-means method shows clear differences between groups with different levels of CCI and savings. Before the pandemic (2018), three clusters were observed, including an outlier represented by Greece, characterised by extremely low CCI values and a negative savings rate. After the pandemic (2022), a shift of more countries (Hungary, Portugal, Turkey) to the low CCI and savings group was observed, highlighting the heterogeneous impact of the crisis on individual economies.

An important element of the results is the relationship between subjective assessments of the economic situation and financial decisions. Countries with higher levels of consumer confidence before the pandemic were characterised by higher propensity to spend and lower propensity to save, which can be seen as typical behaviour during periods of relative economic stability. After the pandemic, low CCI scores, particularly in countries such as Greece and Turkey, were associated with a further reduction in the propensity to save, indicating continued uncertainty and deteriorating economic conditions.

The analysis also allows us to observe that the integration of objective macroeconomic indicators (e.g. unemployment rate, inflation) with consumers' subjective evaluations increases the explanatory power of the relationship between CCI and savings. These results highlight the importance of considering both economic and psychological factors in predicting household financial behaviour.

In an applied context, the results suggest the need to adjust public policies in response to changes in CCI, especially in crisis situations. High savings during a pandemic suggest the possibility of using instruments to stimulate consumer spending to stimulate the economy. Country groupings (obtained by k-means clustering) can be helpful in identifying specific policy and economic needs to enable more precise formulation of economic strategies.

In times of low consumer confidence, it is important to promote financial literacy, which can support the financial stability of households.

In conclusion, the results provide important information on the dynamics of the relationship between consumers' subjective evaluations and their savings decisions, and highlight the importance of integrating multidimensional analyses in economic and financial policy planning.

## 6. CONCLUSIONS

The proposed consumer confidence index offers a number of practical advantages over the original CCI published by Eurostat. Its main advantage is the reduction of the number of components to six variables demonstrating the strongest and most stable relationship with the first principal component, eliminating information redundancy while maintaining a high correlation with the original index (0.70–0.93). This means that the new index is both simpler to construct and interpret, and its calculation requires the collection of less survey data.

For analytical institutions and central banks, the new index offers the ability to more quickly monitor households' propensity to save in real time, without having to wait for the full publication of the twelve CCI components. The simplified structure also facilitates international comparisons: a smaller number of variables reduces the risk of errors resulting from differences in data collection methodologies between EU member states.

For policymakers, the new index's ability to signal changes in saving behavior earlier is crucial. The results of k-means clustering of countries show that the indicator can identify groups of countries at risk of a sharp decline in savings rates, which can be a warning signal for fiscal and macroprudential policy. For example, cluster analysis detected a growing group of countries with extremely low trust and low savings between 2018 and 2022, reflecting the increasing risk in the household segment in the face of successive shocks: the pandemic and inflation.

The indicator can also be useful at the micro level for financial institutions (banks, insurance companies, pension funds) planning savings products and forecasting demand for deposit services. Its high correlation with original Eurostat data, combined with its computational simplicity, makes the new indicator an effective alternative to the full CCI in predictive models of household financial behavior in European Union countries.

All authors have read and agreed to the published version of the manuscript.

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Wacław WIERZBIENIEC<sup>1</sup>Patryk CZERWONY<sup>2</sup>

## FROM THE HISTORY OF NATURAL DISASTERS IN POLAND. THE FIRE IN THE TOWN OF PRZEWORSK ON THE NIGHT OF APRIL 25–26, 1930, AND ITS CONSEQUENCES FOR THE JEWISH POPULATION

This article is a case study that addresses disasters in Poland, focusing on their impact on the Jewish population. It examines the circumstances surrounding a fire that occurred at the end of April 1930 in the small town of Przeworsk, which at the time was also the seat of Przeworsk County. The article highlights the tragedy experienced by the Jewish residents living in the part of the town affected by the fire. The authors assess the preparedness of the town's fire brigade to protect both property and lives in the event of such a disaster, as well as the condition of the Jewish population in that area before the fire. They analyze the rescue efforts for both people and property, the scale and consequences of the fire, and the efforts made to provide material aid to the victims. These efforts were organized by committees established for this purpose, municipal authorities, and the broader community, predominantly Jewish. The article also demonstrates the important role the media (in this case, the contemporary press) played in informing the public about disasters and mobilizing support for relief efforts.

**Keywords:** Przeworsk, fire, fire victims, Jews, charitable aid, press reports.

### 1. INTRODUCTION

Throughout history, fires in densely populated areas in Poland have been among disasters that were relatively frequent and often resulted in tragic events. The issue of urban fires has also become the subject of research carried out by historians (Karpiński, Nowosielska, 2021; Ulicki, 2021). Fires in small towns at the turn of the 19th and 20th centuries in Galicia during the period of the Autonomy and in the Second Polish Republic, particularly in the Lviv Voivodeship, remain a poorly explored research topic. The *Rocznik*

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<sup>1</sup> Wacław Wierzbieniec, University of Rzeszów, Poland; e-mail: [wwierzbieniec@ur.edu.pl](mailto:wwierzbieniec@ur.edu.pl). ORCID: 0000-0001-8830-9982.

<sup>2</sup> Patryk Czerwony, Józef Piłsudski Institute of America, New York, USA; e-mail: [pczerwony96@gmail.com](mailto:pczerwony96@gmail.com). ORCID: 0009-0000-5086-768X.

*Statystyki Galicji* (Yearbook of Galician Statistics), which analyzed fire statistics in Galicia, categorized the types of buildings burned (residential, agricultural, and others), identified causes (e.g., arson, negligence, lightning strikes), and also considered the type of roofing material. Wooden architecture in small towns, which was still quite common at the turn of the centuries, contributed to the spread of fires. Fire statistics reveal the scale of this problem, which led to significant increases in funding for fire safety in the budgets of county towns (Pilat, 1904).

Fire safety regulations were increasingly enforced in rural areas and small towns, where fires were most common. The establishment of fire brigades in the counties was supported by special funds. The system for notifying the public about fire threats and effectively conducting rescue operations was also improved. In response to the real threat posed by fires, a dynamic system of fire insurance developed. Since 1864, the *Towarzystwo Wzajemnych Ubezpieczeń „Floriana”* (Mutual Insurance Society „Floriana”) in Krakow had supported Galician fire brigades financially in acquiring equipment. This organization also provided loans to municipalities for fire safety measures (Szematyzm, 1914). The press, particularly newspapers in Lviv and Kraków as well as county newspapers, was the first to report on the causes of fires, their progression, and estimated damages. Sometimes, the scale of material damage was so significant that it attracted the attention of foreign media, as was the case with the fire in Przeworsk.

Fires destroyed the buildings in some Galician towns. During the period of the Autonomy, notable fires included those in Strzyżów in 1895 (Wnęk, 2022), Lubaczów in 1899 (Kubrak, 2016), Kolbuszowa twice – in 1888 and 1900 (Haptaś, 2023), and Błażowa in 1907 (Kutrzeba, 2023). Fires were sometimes caused by military actions. For example, in September 1914, the Russians burned Cieszanów, while the Austrians did the same in Narol (Gajerski, 1981; Gajerski, 1986), and in May 1915, Gorlice was destroyed during the so-called Battle of Gorlice. In the interwar period, a fire in Rawa Ruska resulted in the destruction of several dozen houses, two churches, and a synagogue in the town center (Pożar Rawy Ruskiej, 1923). In 1928, a wooden market building in Niebylac burned down accidentally (Chuchla, 2010). In the spring of 1930, a fire broke out in the district of Przeworsk inhabited primarily by the Jewish population.

This article contributes to the knowledge about the Jewish community in Przeworsk during the interwar period and the problems it faced (Kozak, 2003; Kuźma, 2011a; Kuźma, 2011b; Wierzbieniec, 2003; Zielecki, 1998). The aim of the article is to present the situation of the Jewish community in Przeworsk in the early 1930s in light of archival sources and press reports detailing the course of the fire in the part of the town inhabited by Jews. The article also discusses the organization of rescue operations and the scope of humanitarian aid provided to the Jewish fire victims by the municipal authorities, as well as the Jewish and Catholic communities. It should be emphasized that the fire in Przeworsk in 1930 was widely covered in the press. The choice of the press as a source material is also due to the diversity of the reports. With the development of the press, particularly local newspapers from the mid-19th century, many articles on such events were published. These press reports usually included estimated material damages, details of the rescue efforts, and information about organized support for fire victims and the displayed sympathy. This information remains a valuable source for researchers.

To this day, the media (including the press) play a crucial role in reporting on the nature and extent of natural disasters and bringing attention to the drama of individuals and communities affected. They make the victims of these disasters visible, thereby mobilizing the audience to take action to help those affected (Hodalska, 2018).

## 2. BEFORE THE FIRE

Przeworsk went through many fires throughout its history – a fate it shared with many small towns in Galicia. Fires often left residents without homes and possessions, while the towns themselves lost their historic buildings (Hoff, 1992). By the end of the 19th century, Przeworsk was a small town. Its architecture was dominated by single-story wooden structures, characteristic of Galician towns, resembling those that can be found in small towns such as Jaśliska, Pruchnik, and Rymanów (Bocheński, 2001). This type of construction was especially vulnerable to fire. The persistent threat of fires led to the formation of fire brigades aimed at protecting lives and property. In nearby Kańczuga, such an organization was established in 1894 (Czerwony, 2024), and in 1896, the Przeworsk fire brigade began operations. Similar brigades had been formed earlier in other towns of the Jarosław County – Radymno (1877), Sieniawa (1879), Jarosław (1880), and Pruchnik (1892). The local government in Przeworsk supported the town's fire service by funding uniforms and equipment (Gajerski, 2001).

A 1928 report submitted to the Przeworsk County Office detailed the organization of the town's fire brigade. The unit consisted of 22 active members. However, it was poorly equipped and ultimately unprepared to cope with a disaster on the scale of the 1930 fire (APP, AmP, sign. 1321). Efforts were also made to improve fire protection infrastructure. Communal ponds were deepened, and several new wells were dug along the main streets to improve water access. The Mleczka River, which runs through Przeworsk, was the primary water source for firefighters, but during a fire, it proved too shallow and too far from the town center to be an effective water resource for the rescue efforts.

The Jewish community lived in the oldest part of Przeworsk, owning homes in the main square and along several adjacent streets, forming what was commonly referred to as the „Jewish quarter”. Locals often informally referred to Kazimierzowska Street as „Jewish Street” or the „Jewish backstreets”. The quarter's dense, poorly maintained buildings and extended outbuildings posed a serious fire hazard. Some Polish residents recalled this area with a certain malice:

That world of crooked houses, sheds, shacks, dirt, and ugliness seemed oddly exotic. A monstrous anthill of Orthodox Jews crammed into every inch of unoccupied space, repurposed for any kind of trade that could earn a few coins. A testament to the perfected entrepreneurship and cunning of the Jews was visible in the architecture typical of that street. People would often build only three walls – cleverly leaning them against the old defensive wall along the northern side of the street, which eventually disappeared from view. And as the population grew – given the high birthrate among the Jews – there was constant building, rebuilding, adding and expanding wherever space remained. The street was narrow, the yards small and cramped, and it was filled with all sorts of extensions, sheds, shacks, and market stalls. (APP, AJB, sign. 80).

Other recollections present a more nuanced picture of Jewish life in Przeworsk:

Anyone looking for fabric would go to Rachela Chuna Brandt's shop on Kazimierzowska Street. In that hut, there was a staircase leading to a basement where she kept a stock of all kinds of textiles from Bielsko. That entire district, along with the northern row of the main square, burned down

during the infamous Przeworsk fire on the night of April 25–26. If you needed a hat, shirt, tie, galoshes, cane, or any other kind of men's accessories, you'd go to Zachariasz Adolf's shop. Aside from the giants of the Jewish trade scene, there was also a class of poor stallholders whose capital amounted to just 200 or 300 zloty. These impoverished merchants relied on short-term loans from the Jewish Credit Cooperative run by attorney Dr. Anzelm Kleinman (Stepkiewicz, 1990).

The town's economic life revolved around the market square and a few nearby streets, where public administration offices and religious institutions were located, including those of the Catholic Church and the Jewish Religious Community. A key role in the town's economy was played by the Przeworsk Estate of Prince Andrzej Lubomirski (Chrobak, 2021; Księga..., 1929).

### 3. THE FIRE AND THE COURSE OF THE RESCUE OPERATION

During the night of April 25–26, 1930 (Friday to Saturday), a fire broke out in a central area of Przeworsk inhabited almost exclusively by the Jewish community. The blaze destroyed a significant portion of the town's wooden architecture. Witnesses agreed that the fire was caused by negligence in the home of Sara Wein, who operated one of several taverns in Przeworsk (Księga..., 1929). Ironically, her house was not damaged in the fire.

Eyewitness accounts of the event are preserved in memoir literature. One local resident, describing the event, noted that the weather was calm and windless that night, which helped slow the spread of the flames. Nevertheless, the material losses were substantial, as entire residential and utility structures were destroyed. "Dozens of people – elderly, women, and children – camped out on nearby streets and squares. The entire neighborhood was burned down; only chimneys and brick façades remained" (Benbenek, 1974). Photographs capturing the devastation of the Jewish district are now preserved in the museum in Przeworsk (Wołoszyn, 2011).

Extensive information about the fire appeared in the firefighting press. The monthly magazine „Walka z Pożarem” („The Fight Against Fire”), dedicated to fire safety and prevention, published a detailed account of the incident. According to the report:

Just after midnight, the city was alarmed by a fire that broke out in the 'Jewish backstreets' near the Market Square, an area inhabited mostly by the impoverished Jewish population. The flames spread rapidly, soon engulfing the entire district. Panic gripped the town. Residents from nearby homes, awoken from sleep and in a state of shock, began evacuating in chaos, hindering rescue efforts. The towering columns of fire were visible for tens of kilometers – seen from Przemyśl on one side and Rzeszów on the other. Fire brigades from these cities, along with Jarosław and Łańcut, rushed to help. [...] The fire reportedly began at 12:10 a.m. in the attic of Sara Wein's tavern, located next to the town hall and the old synagogue. The flames spread at an extraordinary pace, consuming one building after another. Within less than an hour, 49 structures were burning, including the old synagogue. In the midst of the chaos, half-naked and distraught, residents rushed their belongings from homes and shops into the streets [...]. (Straszliwy..., 1930b).

The report also mentioned the involvement of the Volunteer Fire Brigade from the local sugar refinery in containing the fire. A major explosion was narrowly averted when firefighters secured a nearby fuel depot behind the home of Rojza Berger, a local gasoline merchant.

In addition to the Przeworsk firefighters, the rescue operation involved military training units, the local paramilitary group Strzelec, and a military company from Jarosław. Firefighting journals across the country covered the disaster, using it as a cautionary example for other towns (Sakiewicz, 1930).

Efforts to extinguish the fire were severely hampered by the densely packed wooden buildings and a failing hydrant system. The equipment available to the Przeworsk fire units, who were first on the scene, proved insufficient (Kruk, 2021).

The Lviv-based newspaper *Wiek Nowy* published a comprehensive article on the rescue efforts, based on official sources. It was reported that the fire was brought under control around 5 a.m., after several hours of struggle. Ten firefighters sustained minor injuries during the operation. In addition to professional units, volunteer fire brigades from neighboring communities – Kańczuga, Markowa, Studziany, and Urzejowice – also participated in the efforts (Wielki pożar w Przeworsku, 1930c).

A personal account written nearly 50 years after the event adds little factual information but conveys the emotional weight of the moment, especially in the crucial first hour:

Volunteer fire brigades from the surrounding areas quickly arrived. They deployed their rescue equipment according to defense plans and sprang into action. However, the lack of water rendered their commitment and sacrifice ineffective. The exhaustion of those operating the pumps took its toll. The fire raged on, with no end in sight. (MwP, ZPP, sign. MP-PA-353).

#### 4. THE SCALE AND IMPACT OF THE FIRE IN PRESS COVERAGE

The first to report on the causes, development, and estimated losses of the Przeworsk fire were newspapers – most notably those based in Lviv and Kraków, along with regional press outlets. *Expres Jarosławski* highlighted the bravery of the firefighters and all emergency services involved in battling the flames. The newspaper strongly condemned individuals who tried to profit from the tragedy, calling their behavior disgraceful: “It is painful to note that even in such a terrifying moment, there were hyenas feeding off the misfortune of others” (*Po strasznym...*, 1930).

The *Przemyśl* press recorded that during a city council meeting on April 30, a delegation from the Przeworsk local government formally thanked Przemyśl firefighters for their support during the disaster (*Posiedzenie...*, 1930). Residents of Kraków first learned about the fire through the *Ilustrowany Kurier Codzienny* on Monday, April 28. The paper featured a brief article titled: “Catastrophic Fire in Przeworsk: 45 Jewish Homes Completely Destroyed – Five Fire Brigades Contain the Blaze”. A correspondent from Przeworsk wrote:

At midnight on Saturday, April 26, a fire broke out in the home of Sara Wein, rapidly spreading as it caught the old wooden shingle roofs. Terrified residents escaped with their lives, wearing nothing but underwear. The first to notice the fire was Officer Franciszek Piasek, who immediately alerted the fire brigade. The town’s volunteer fire service and the Sugar Refinery brigade rushed to the scene, but it was too late to save the building. The blaze

jumped from house to house, consuming the entire Jewish wooden quarter. (Katastrofalny..., 1930c).

Two days later, the same newspaper published a front-page photo of the burning town and included updated damage estimates (45 domów..., 1930). Kraków's *Głos Narodu* covered the event twice, but largely repeated existing information (Przyczyna..., 1930; Wielki pożar w Przeworsku, 1930a). The socialist press emphasized the broader social consequences. Kraków's *Naprzód* published its first report on April 28 (Wielki pożar w Przeworsku, 1930b), and in a follow-up article estimated material losses at approximately 500,000 złoty—300,000 of which concerned buildings and real estate. Though most buildings were insured, they were underinsured, and the goods of small-scale Jewish traders, who dominated the area, were not insured at all (O pożarze..., 1930). Warsaw's leading socialist newspaper, *Robotnik*, ran a headline on April 27: "Przeworsk: Fire Destroys 43 Buildings – 324 People Affected (Przeworsk. Pożar..., 1930).

The ruralist press also took note. The Kraków-based *Piast* reported the fire in Sara Wein's house and its rapid spread through the wooden Jewish district (Straszny..., 1930). The conservative Kraków daily *Czas* offered a detailed article estimating losses and highlighting that the Jewish community was hardest hit. The paper commended the response of public officials, particularly the Przeworsk starosta and the Lviv voivode, and reassured readers that the local sugar refinery and estates belonging to Prince Andrzej Lubomirski were not damaged. It was also reported that the Lubomirski estate provided financial aid to the victims (Pożar Przeworska, 1930a). Lviv's widely read *Gazeta Lwowska* gave extensive coverage, alerting readers as early as April 27:

Major Fire in Przeworsk: 43 Buildings Burned – 324 People Left Homeless. Lviv Voivode Gołuchowski Travels to the Disaster Site" (Groźny..., 1930a). An official statement from the Lviv Voivodeship Office confirmed the destruction of 13 brick buildings on the north side of the market and 30 additional structures, affecting 48 families – 324 people, predominantly Jewish (Groźny..., 1930a).

The strongest reaction came from the Jewish press. On April 28, the Lviv-based *Chwila* ran a front-page article titled: "Przeworsk in Flames", reporting that the Jewish district had burned down, leaving 324 people homeless (Przeworsk w płomieniach, 1930a). Inside the paper was an in-depth account of the fire, the destruction of two synagogues, and references to the Voivodeship Office's position on the tragedy (Katastrofalny..., 1930a; Komunikat..., 1930). In Kraków, the Jewish newspaper *Nowy Dziennik* also covered the disaster extensively. First reports appeared on April 28 (Przeworsk w płomieniach, 1930b). A dramatic front-page article followed on April 29, detailing the fire's progression (Na zgliszczach..., 1930). A later piece focused on the loss of a valuable library of Hebrew texts collected over generations by Hersz Rottenstreich, head of the Przeworsk kahal – a cultural loss considered especially painful (Lista strat..., 1930). The editorial office also opened a help desk for those wishing to support the victims (Akcja..., 1930a). The State Telegraph Agency in Lviv helped spread the news nationwide. Newspapers in Bydgoszcz, Częstochowa, Gdańsk, Inowrocław, Katowice, Łódź, Poznań, Sosnowiec, Toruń, and Warsaw (including *Robotnik*) reported on the disaster, often citing similar numbers and damage assessments (Pożar Przeworska, 1930b–g).

International press also covered the event. The Polish-language *Przegląd Tygodniowy*, published in the United States, ran a front-page headline: “43 Residential Homes Burned!”, stating the fire began with candles lit in a synagogue (43 Domy..., 1930). Newspapers in Strasbourg and the UK reported on it by April 28, with Daily Herald estimating 1,500 people homeless and identifying the affected area as one primarily inhabited by Jews involved in small trade (1,500 Homeless, 1930). The *Northern Whig* echoed that report (*The major...*, 1930), while *Sheffield Daily Telegraph* added that the Red Cross had begun distributing food and building temporary shelters (1,500 People..., 1930). Two months later, even a Jewish community paper in Sydney, Australia noted the event (The greater..., 1930).

## 5. RELIEF COMMITTEES FOR FIRE VICTIMS IN PRZEWORSK

On April 26, 1930, immediately after the fire in Przeworsk was brought under control, two relief committees were established: the *Civic Relief Committee for Fire Victims in Przeworsk* and the *Jewish Relief Committee for Fire Victims in Przeworsk*, which was later renamed the *Jewish Rescue Committee*. Both coordinated efforts to provide organized assistance to those affected by the fire and conducted preliminary assessments of material losses. The Civic Relief Committee included representatives of both the Christian and Jewish communities:

- Rev. Leon Gondelowski – parish priest of the Holy Spirit Church in Przeworsk,
- Adam Remiszewski – district governor of Jarosław,
- Dr. Leon Pieniążek – deputy mayor of Przeworsk,
- Dr. Aleksander Karpf – attorney,
- Szulim Aszkenazy,
- Rabbi Eliasz Fränkel,
- Walenty Rybacki – mayor of Przeworsk,
- Ignacy Rosiński – director of the Przeworsk sugar factory,
- Dr. Anzelm Kleinman – attorney,
- Hersz Rottenstreich – chairman of the Jewish Religious Community in Przeworsk.

Dr. Aleksander Karpf chaired the Jewish Rescue Committee, which consisted of members of Przeworsk’s Jewish elite: Schulim Aszkenazy, Eisig England, Rabbi Eliasz Fränkel, Dr. Anzelm Kleinman, Dr. Mojżesz Landau, Hersch Rottenstreich, and Sina Schuldenfrei.

The Civic Relief Committee operated until October 22, 1930. Its dissolution marked the formal end of organized charity drives and collections for fire victims. During its six months of activity, the committee played a key role in providing significant aid. Funds remaining in its accounts were transferred to the still-functioning Jewish Rescue Committee and to the Przeworsk Municipal Savings Bank to ensure fair and transparent distribution (APP, AmP, file no. 1290).

In the days following the fire, both the civic and Jewish committees issued public appeals for material aid. The appeals published in the press reached the widest audience. In early May 1930, *Chwila* printed the Civic Committee's plea for assistance, stating:

In the face of enormous tragedy and amidst the smoldering ruins, the Relief Committee appeals, on behalf of all residents of our city – regardless of faith or nationality – to all compassionate hearts for generous donations. All in-kind contributions should be sent to: ‘Municipality of Przeworsk – for fire

victims'; financial donations to the District Office in Przeworsk, PKO account no. 51 293 – for fire victims (*Obywatele!*, 1930).

*Nowy Dziennik* published a letter from the Civic Committee thanking donors for nearly 3,500 zł in contributions. The committee members also noted a decline in public enthusiasm for the relief effort, hence the renewed press appeals (*Obywatelski...*, 1930). Senator Dawid Schreiber, a Zionist, addressed Jewish readers of *Chwila* in an appeal titled "Help for the Fire Victims of Przeworsk! To the Jewish Community". He wrote:

The Jewish community has a duty to provide immediate and substantial assistance. We can help with money, clothing, and footwear so that those who lived by their own labor and have lost everything through no fault of their own are not driven into beggary and dependency. Let us help them return to their workshops, shops, and trades. Jewish generosity will not fail. Jews! Support your unfortunate brethren! Bring money to rebuild homes and businesses. Donate clothes, linens, shoes –remember the children of the victims (O pomoc..., 1930).

Already in April, the Jewish Relief Committee issued an appeal to the Jewish community:

Jews, a terrible disaster has struck the Jewish population of our town. On the night of April 25–26, 1930, a fire broke out in the market square and within hours the entire Jewish quarter was in flames. Over 50 buildings, including two synagogues, were destroyed. Nearly every Jewish family has suffered. Around 100 livelihoods were completely destroyed, and 425 people are now homeless." The appeal continued: "Let every Jewish community contribute, even modestly! Let relief committees be formed in every Jewish town. Let no one withhold their effort, assistance, or money. Jews, save the Jewish community of Przeworsk from annihilation! (MwP, ZPP, file no. KWM 3138/03).

## 6. AID INITIATIVES

Archival and press sources reveal numerous examples of spontaneous aid given to the fire victims. The unaffected residents of Przeworsk offered immediate help. Local Catholics provided temporary shelter, while townspeople donated clothing and linen, which were promptly distributed. The Przeworsk estate sent a wagon of potatoes, and the sugar factory donated 200 kg of sugar. The Gemilat Chasudim charity also contributed. On May 10, 1930, Prince Andrzej Lubomirski of Przeworsk pledged 5,000 zł in support. Women from the local elite, both Polish and Jewish, formed the "Ladies' Committee" to raise funds. At a meeting on June 20 in the district office, they agreed to collect donations in the town center and streets near the market square (APP, AmP, file no. 1290).

Aid came from many towns. The day after the fire, a wagonload of bread arrived from Kańczuga. Help also came from Cieszyn, Bielsko, Kraków, Rzeszów, Zakopane, and other cities. Senator Schreiber personally advocated for assistance from the Lviv province governor and visited Przeworsk to meet with local officials (*Śpieszmy...*, 1930; *Kto...*, 1930). On April 28, 1930, the Jewish Religious Community in Lviv donated 1,000 zł to the victims. Similar contributions were made by Jewish communities in Rzeszów and

Krosno, where committees and women's groups organized fundraising efforts (Na pogorzalców..., 1930; Krosno..., 1930). In Kraków, two committees raised funds – one through the Zionist Organization for Western Lesser Poland and the other at the local Jewish Community headquarters. Correspondence was exchanged with the Jewish Community Board in Warsaw to organize both immediate and long-term support. The B'nai B'rith humanitarian organization also contributed:

- “Braterstwo” in Warsaw donated 200 zł,
- “Humanitas” in Przemyśl gave 500 zł,
- “Ezra” in Bielsko contributed 180 zł,
- “Leopolis” in Lviv also provided financial aid in 1930 (ANK, BB, file no. 78 (Sroka, 2014, 2016).

The newspapers *Chwila* and *Nowy Dziennik* listed the most generous donors. Zionist Organization members across various cities joined the relief efforts. For instance, the Łańcut branch collected 1,300 zł in May 1930, while Hanoar Haivri collected clothing and linen (*Z inicjatywy...*, 1930). A similar effort was led by the Jewish youth movement Haszomer Hacair in Krosno, which encouraged students to donate. Schoolchildren, including students from the Jewish Elementary School in Rzeszów, were among the listed donors. Public servants, professionals, banks, and businesses also made significant donations (*Akcja...*, 1930b). Even Władysław Yrley-Jurkiewicz, a pianist and professor at the Berlin Conservatory, offered to perform five benefit concerts in Drohobycz, Jarosław, Przemyśl, Rzeszów, and Sambor, with proceeds going to the fire victims (APP, AmP, file no. 1292).

## 7. DEMAGE ASSESSMENT AND MUNICIPAL RESPONSE TO THE FIRE VICTIMS

The Przeworsk city council deliberated intensively on how best to allocate the incoming relief funds. Proposals included immediate aid for the homeless and the construction of emergency shelters. Dr. Kleinman advocated using the funds to restore workplaces and homes and to provide housing stipends. He believed the state and municipal authorities should fund shelter construction. Director Rosiński opposed building shelters, favoring direct financial and administrative support for renting or buying housing. In June 1930, city representatives approached the Ministry of Treasury and the National Economy Bank to request construction loans. These efforts were led by the City Development Committee of Przeworsk. In October 1930, the city proposed creating a fund for impoverished Jewish children whose families had been affected by the fire to enable their participation in summer camps (APP, AmP, sign. 1290).

As early as April 27, a joint meeting of the Civic and Jewish Relief Committees was held at City Hall. Schulim Aschkenazy, head of the finance section, presented a preliminary damage report and a list of those in urgent need. That same day, a city-employed cashier distributed aid funds with receipts to ensure transparency. An audit committee was formed to oversee spending.

The finance and welfare committees compiled a complete list of fire victims and designated 6,150 zł from the Lviv province governor for 67 families (202 adults and 148 children). Aid ranged from 30 to 200 zł per family. In the following days, another 29 victims received aid from city funds. By the end of April 1930, more than 8,000 zł had been distributed (APP, AmP, sign. 1292).

At Przeworsk's municipal office, intense discussions took place regarding how to allocate the incoming relief funds effectively, with a focus on providing tangible assistance to those affected by the fire. There was an urgent call for immediate support for residents left homeless. One proposal was to construct temporary housing in the form of barracks. However, opinions on this issue were divided. Dr. Kleinman argued that the collected funds should be used to rebuild workplaces and livelihoods, and to provide grants for purchasing essential furnishings for homes still deemed habitable. He suggested that the cost of building temporary shelters should be borne by the government and the city administration. In contrast, Director Rosiński opposed constructing barracks. He believed the fire victims should instead be supported with direct financial aid and administrative assistance in finding rental or permanent housing.

In June 1930, the Przeworsk municipal government decided to send representatives from its finance department to the Ministry of Treasury and the National Economy Bank to request construction loans for rebuilding the destroyed homes. These efforts were coordinated by the City Development Committee of Przeworsk, operating under the city administration. By October 1930, the city also proposed the creation of a special fund for impoverished Jewish children whose families had suffered in the fire. The collected funds were intended to allow these children to participate in annual summer camps (APP, AmP, file no. 1290). Earlier, on the morning of April 27, a joint meeting of the Civic Relief Committee and the Jewish Relief Committee was held at the town hall. Schulim Aschkenazy, head of the finance section, presented a report based on on-site assessments made by committee members. He submitted a list of victims in need of urgent assistance. That same day, a municipal cashier began distributing emergency funds to victims, issuing receipts for each payment. To ensure transparency, a special audit committee was established.

A full register of fire victims was compiled by members of the municipal finance, food, and supply committees. It was decided how to allocate a sum of 6,150 złoty received from the governor of the Lwów Province. A total of 67 families benefited – comprising 350 people, including 202 adults and 148 children. The individual aid amounts ranged from 30 to 200 złoty. In the following days, additional relief payments were made to another 29 individuals using municipal funds. By the end of April 1930 alone, a total of 8,000 złoty had been distributed to those affected by the fire (APP, AmP, file no. 1290). In early May, the newspaper *Chwila* published a list of 78 fire victims from Przeworsk along with their sources of livelihood. This list was reprinted by several other newspapers, primarily Jewish publications (see Table 1).

Table 1. Fire Victims from Przeworsk (1930)

Name and Occupation	Name and Occupation	Name and Occupation	Name and Occupation
Adolf Zacharjasz – Haberdashery	Moses Reifer – Lime production	Samuel Strauch – Ritual slaughterer	Leib Stokman – School caretaker
Abraham Eisner – Textiles	Samuel Locker – Tableware	Józef Prinz – Jewish teacher	Salomon Braten – Cutter
Selman Langsam – Flour	Dawid Grünes – Textiles	Anczel Feder – Textiles	Dawid Zuker – (No occupation listed)

Table 1 (cont.). Fire Victims from Przeworsk (1930)

Name and Occupation	Name and Occupation	Name and Occupation	Name and Occupation
Mojżesz Thei – Textiles	Saul Lang – Textiles	Jakub Dawid Rosenbaum – Pots	Chana Schüler – (No occupation listed)
Hersch Rosenberg – Food wholesaler	Osias Goldberg – Groceries	Gecel Thei – Textiles	Józef Rottenstreich – Dairy
Kella Ringelheim – Colonial goods	Rachmiel Friedman – Food wholesaler	Józef Braten – (No occupation listed)	Isak Gewürzman – Rabbi
Mendel Braten – Footwear	Hersch Lachs – Soda water production	Leib Stosser – Coachman	Zinsche Katz – (No occupation listed)
Sucher Gewürz – Haberdashery	Mojżesz Spigler – Grain	Isak Lichtenstein – Fiddler	Lea Engelberg – (No occupation listed)
Jakub Rosenbaum – Pots	Salamon Basseches – Textiles	Barisch Barber – Confectioner	Laser Riesenbach – School caretaker
Markus Brand – Groceries	Berta Landau – Iron goods	Samuel Bier – Tailor	Szymon Katz – (No occupation listed)
Jakub Feldstein – Haberdashery	Azriel Diller – Haberdashery	Sima Bande – (No occupation listed)	Józef Fränkel – Groceries
Selig Schwefel – Haberdashery	Rosa Freiberg – Haberdashery	Gecel Sperber – (No occupation listed)	Dawid Tannenbaum – Groceries
Osias Landau – Haberdashery	Jakub Landau – Footwear	Eisig Englard – Tavern owner	Osias Berger – School caretaker
Matys Weinberg – Textiles	Hersch Rubin Lockman – Groceries	Markus Siegel – Carpenter	Dawid Bergam – (No occupation listed)
Hersch Rotenstreich – Textiles	Eliasz Rotter – Poultry seller	Abraham Biernbach – (No occupation listed)	Esig Reisfeld – (No occupation listed)
Markus Frieder – Iron goods	Markus Straus – Printer	Jenta Jakobowicz – (No occupation listed)	Chana Banda – (No occupation listed)
Abraham Englard – Haberdashery	Moses Leib Bronne – Haberdashery	Fischel Feldman – (No occupation listed)	Jakub Tenzer – Yeast seller
Dawid Weinberger – Haberdashery	Chaim Langsam – (No occupation listed)	Mechel Kalech – Groceries	Rachela Brand – Textiles
Abraham Kesten – Leather trade	Getzel Bier – Coachman	Abraham Einhorn – Coachman	Jakub Mersel – Tailor
Ksiel Blau – Baker	Hersch – (No occupation listed)		

Source: Lista pogorzalców (1930). *Chwila*, No. 3989.

In the fire that affected the city, there were no fatalities, but 424 people were left homeless. Significant material losses were recorded, estimated by the victims to be around 500,000 zł. Two synagogues and more than 50 residential buildings, mainly wooden, were destroyed, including 13 brick buildings, as well as agricultural facilities and the goods

stored there. About 30 shops and a bakery were also destroyed. The damaged buildings were insured, but the losses in goods were not covered by insurance. Although the destroyed buildings were insured for 160,750 zł, the victims were compensated with 105,000 zł (Kruk, 2021). As a result, the losses were much higher than the compensation paid, even though the assistance provided to the fire victims was quite substantial and covered a wide range of social groups. The data on the value of the losses, provided by the victims, significantly differed from those published by the Central Statistical Office in Warsaw. According to the data from the Central Statistical Office, in 1930, there were 11 fires in the Przeworsk county, which led to the destruction of 87 buildings, including 56 residential buildings. The value of the building damages resulting from the fires was estimated at 118,000 zł (Statystyka..., 1934).

## 8. CONCLUSION

The material consequences of the fire in Przeworsk in 1930 were most acutely felt by the poorest segment of the Jewish population. In their efforts to return to work and find housing, they were supported by the Jewish Society for the Aid of the Poor and Sick Jews, which was established in 1931 and operated within the Przeworsk Jewish community.

In May 1932, the Board of the Jewish Religious Community in Przeworsk requested the Przeworsk municipal authorities to re-define the plot for the planned construction of a synagogue. It was noted that the previous synagogue had been destroyed in the fire. Assurances were given that the new building would be „constructed from durable materials and fire-resistant roofing”, in compliance with the new building regulations (APP, AmP, sign. 1296).

Following a decision from the Lviv Provincial Office, a decree was issued regarding the consolidation of land plots in the part of the city of Przeworsk destroyed by the fire in 1930, with a total area of 8,176 square meters. The boundaries were: south to the market, north to Kościuszki Street, east to Lwowska Street, and west to Fiakerska Street. The rationale for this decision stated that the reconstruction of residential buildings would not be feasible due to the small size of the plots, their faulty shapes, and unsuitable locations. Therefore, an appraisal committee was appointed to implement this decree. This project was contested by some residents who felt they had been wronged, and they considered the proposed compensation to be insufficient. A slight modification to the plan was made, but an agreement was not reached (APP, AmP, sign. 1296). As a result, this important project for the spatial development of the city was not realized by 1939.

In 1929, the plans of the Committee for the Development of Przeworsk were initiated, and after the fire, these plans gained momentum, but due to the difficult economic situation of the residents, they did not achieve the intended goal. A construction loan was available, but servicing the loan exceeded the financial capabilities of most local entrepreneurs. Efforts to significantly stimulate construction activity were unsuccessful, despite the easing of regulations for obtaining building permits for residential buildings. However, an agreement was reached regarding the construction of a market, consisting of 10 separate shops, for the affected entrepreneurs by November 1, 1932, as well as business relief for them (APP, AmP, sign. 1290). This decision was significant in the context of the growing economic crisis and rising unemployment, which was attempted to be limited through administrative measures (APP, AmP, sign. 1291).

After the fire, there was a gradual improvement in safety conditions. In March 1931, the local government decided to build a two-story water tower located in the center of the

city. Two 16,000-liter water tanks and a pump were installed, which drew water from the Mlecza River. The streets adjacent to the market were equipped with a modern system of hydrants and pipes to ensure sufficient access to the river in the event of a fire (APP, AJB, sign. 130). Noticeable changes also occurred in the organizational structure of the Przeworsk fire department (MwP, ZPP, sign. MP-PA-2). However, based on the available body of sources, it is difficult to analyze and assess the social consequences of the fire, including its impact on Polish – Jewish relations in the city during the 1930s and during World War II.

The article, fitting within the field of microhistorical research, also addresses issues of broader social significance, such as the still-relevant matter of fire safety. It draws attention to the mechanisms of social solidarity, the organization of aid for disaster victims and also discusses the role of the media in informing and mobilizing public opinion.

Considering the significance and consequences of fires for various localities in the Second Polish Republic, it would be valuable to expand research on this topic, as presented in this case study of Przeworsk. Such research requires a broad and labor-intensive inquiry. Consequently, this should lead to the creation of a synthesis on fires in the interwar period, filling a gap in the historiography of Poland's socio-economic history during this period.

All authors have read and agreed to the published version of the manuscript.

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