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European Journal of Social Impact and Circular Economy

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Fundamental Performance Analysis of Listed Mutual Fund Companies in the Dhaka Stock

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Abstract

This study investigates the performance of closed-end mutual funds listed on the Dhaka Stock Exchange over the period 2015 to 2023, emphasising the comparative dynamics before and after the COVID-19 pandemic. Employing a panel data framework, it analyses key financial metrics—Return on Investment (ROI), standard deviation, beta, and Sharpe ratio—to extract fund behaviour patterns under market stress and recover conditions. The results reveal heterogeneous performance trajectories: while several funds underperformed post-pandemic, others exhibited notable resilience and gains. These extracted insights underscore the critical importance of risk-adjusted returns in fund evaluation and strategic asset management. Despite its strengths in longitudinal data coverage and quantitative Rodrigue study is constrained by the absence of qualitative factors that could contextualise performance variations.

Keywords: Mutual fund performance, Closed-end mutual funds, Fundamental factors, Financial performance, Operational performance

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1. Introduction

The mysterious world of mutual funds casts a seductive attraction in Bangladesh's maze-like financial landscape, particularly when examining the opaque world of closed-end mutual funds. Nestled among the complex creases of the Dhaka Stock Exchange, these thirty-two listed funds reveal a tapestry of performance nuances that beg to be unravelled. An unbalanced panel data study from 2015 to 2023 reveals its esoteric mysteries, unveiling an arcane symphony. The performance evaluation in this work unfolds into a tripartite complicated tapestry: overall efficacy, operational strength, and financial performance. Financial performance, the ultimate in financial knowledge, is determined by a dizzying array of indicators, such as return on equity, investment, sales, profit margin, assets, earnings per share, stock price, and the turbulence of sales growth. Operational prowess, that elusive ballet of efficiency, market share, and inventiveness, pirouettes in the shadows and whispers success secrets. Moreover, total efficacy remains mysterious while serving as a stand-in for reputation, goal achievement, survival, and the ethereal quality of perceived performance. Amateurs are lured to invest with mutual funds, those enigmatic means of generating money, among the turbulent waters of the investment world.

It is necessary to first familiarise oneself with the two types of mutual funds available in Bangladesh's market: open-ended and closed-ended. The first, like a chameleon, lets investors move freely through its constantly changing terrain, purchasing and disposing of units at will, whilst the second, a stable constellation in the financial sky, trades on the secondary market, unchanging yet alluring. Investigating becomes the compass that leads the daring adventurer through this maze. Examinations should be conducted based on performance history, investment strategy, management calibre, and fees. The key to solving each fund's riddles lies in the prospectus, a voluminous document full of occult information. Diversification speaks its incantations as the secret of risk mitigation. To reduce risk and increase return, the seeker needs to diversify their wagers among a variety of asset classes and financial objectives. The symphony of voices that is the investing world extols diversity and balance. Deciding from among the many options mutual funds provide takes thought. The alluring sounds of balanced funds, fixed-income securities, equity funds, and shariah-compliant investments beckon you in. Each one has a unique melody that corresponds with the investor's objectives and desires. Because they provide a plethora of investment alternatives that are beyond the means of the typical individual investor, mutual funds are appealing. How do the fundamental components of return on investment, actual deviation, standard deviation, beta computation, coefficient of variation, and regression analysis fit together to shape the performance of closed-end mutual funds listed on the Dhaka Stock Exchange? One question sticks out like a lighthouse in the fog deep within this maze of confusion. How do the various facets of financial strength, operational flexibility, and the intangible attribute of overall success relate to these threads of complexity? This question, a riddle wrapped in an enigma, seeks to illuminate the shadowy areas and uncover the secrets that reside within Bangladesh's financial systems. The pursuit of study has the prospect of shedding light on the opaque workings of mutual fund performance through diligent analysis.

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2. Literature review

The Signal Theory serves as a beacon in the realm of investment dynamics, guiding the identification of crucial data that is critical to an investor's performance. This theory states that important signals are management disclosures, which are full of information on investors' welfare. These data can be presented in a variety of ways. It can display, among many other things, the growth in business profits, the decrease in expenses, the rise in share prices, the expansion of assets, and the rise in earnings per unit (EPU). Yuliza (2018) did a detailed investigation of the Signal Theory and found a substantial association between the positive EPS and stock market volatility, as well as the tremendous influence of earnings per share (EPS).

An organisation that begins its metaphorical trip through the organismic life cycle reflects the ups and downs of human existence as well as the blossoming and withering of botanical lifeforms. There is a peak in time when profitability and productivity increase, and there will inevitably be a low point when they decrease. Therefore, it is reasonable to claim that firm age and profitability have a substantially adverse connection. Meanwhile, a fascinating inverse relationship develops between firm size and performance, with the former growing at the expense of the latter, as the research projects of Ila Boya & Hookah (2016) shed light on the complex relationships between firm age, size, and profitability dynamics.

James Tobin, the Nobel winner, presents an intriguing story about how a company's financial future depends critically on its managers' ability to balance investment spending while reducing the gap between capital costs. However, asset growth is a volatile phenomenon, with its importance fluctuating depending on the socioeconomic landscape, as evidenced by the disparate effects seen in established, developing, and underdeveloped areas. Economic efficiency maxims extol the benefits of skilled management, assuming a mutually beneficial relationship in which fund managers, in their skilful stewardship, attract substantial returns, justifying fees extracted from investors' funds. Experiential journeys sail the turbulent waters of Bangladesh's Dhaka Stock Exchange (DSE), evaluating the performance and prospects of the sacred mutual funds nestled inside its embrace. A critical eye is trained on 32 closed-end mutual funds, with their financial stories painstakingly examined from the records covering 2015 to 2023. The absence of data for the 37 newcomers is bemoaned, serving as a sobering reminder of the gaps in the research landscape. The chorus of incompetent management, the scarcity of strong companies, and the lack of wise portfolio managers echo recurring themes in the tumultuous crucible of the Bangladeshi stock market. Furthermore, the turbulent landscape is made worse by investors' tendency to follow the siren call of direct investment techniques and flitting speculations rather than the steady march of long-term investments or the embrace of mutual funds. The culmination of the research is a symphony of policy recommendations that provide a picture of how the mystique surrounding larger mutual funds obscures the true nature of economies of scale, notwithstanding their apparent superior performance. The age of mutual funds is no longer a performance indicator, but rather a warning sign that points to the possibility of inefficiency and negative market conditions. Policymakers should heed this caution and usher in a new era. Moreover, investors are forced to look past the short-term rippling and toward the horizon of sustained long-term performance, navigating the maze-like mutual fund market contours with wisdom and insight as the true Gordian knot of asset growth untangles its mutually beneficial dance with fund performance significant but uncertain.

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The shareholder theory is the term for this concept. Instead, Freeman and McVea propose redefining the firm's objective by expanding the firm's purview to encompass the needs and desires of all major stakeholders. However, because they are not directly managing the firm, secondary stakeholders such as suppliers or customers can still have a collective influence over the business and its actions despite being external to it (Alberton et al., 2022).

The fundamental tenet of the stakeholder theory is that any company seeking to flourish must create value for each and every stakeholder, including suppliers, customers, employees, the community, and so forth. When they work together, they create something for which none of them is responsible alone (Alberton et al., 2022). Businesses have also been shown to benefit from stakeholder theory, as it enhances performance when consideration is given to all stakeholders rather than just shareholders (Alberton et al., 2022).

Incorporating a stakeholder theory into business processes improves competitive advantage, claim Lahouel et al. (2022). The findings showed that, particularly in the expansion of employee and customer relationships, stakeholder management generates increased operational productivity and competitive advantage (Lahouel et al., 2022). Without a doubt, this thesis's topic has something to do with the idea of stakeholder theory.

The idea highlights how important it is that a wide range of stakeholders participate in an organisation's decision-making process. Because mutual funds are by their very nature concerned with the effects of several stakeholders, including as suppliers, employees, and the general public, it is therefore related to this subject. The funds' resilience to the COVID-19 financial crisis was also assessed. Furthermore, given that mutual funds take shareholder requirements and preferences into account when making investment decisions, it will be fascinating to observe if they outperform traditional funds with low mutual fund scores. Additionally, the idea can be used to explain changes in investment behaviour, particularly in times of financial crisis. Investors may start to gravitate toward funds that share more of their ideals when it comes to taking responsibility for societal or environmental challenges. In late 2019 an outbreak of the coronavirus started in Wuhan, China. Because of its high infection rate, millions of people worldwide became infected with it as it spread quickly. Millions of people also died as a result of the illnesses. According to Bentes (2021), the virus had claimed the lives of almost 2.9 million people by April 2021. The economy was also affected by the virus's shockwave. Governments implemented travel bans, social distancing, and lockdowns where people were not allowed to work in order to combat the daily spreads. Due to the social economy's stop, there was a significant increase in uncertainty in the economy (Bentes, 2021).

Unquestionably, the coronavirus has affected the industry, particularly the financial market. Four market meltdowns occurred in less than two weeks in March 2020, and the market has become more risk averse since the disease began to spread in early March (Gao et al., 2022). COVID-19 was identified as the primary cause of the 2020 market meltdown because it had a greater impact on market volatility at the beginning of the spread. Nevertheless, even though there were between 30,000 and 40,000 new instances of coronavirus every day, as the pandemic progressed, the stock market became more impervious to the shock (Gao et al., 2022).

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3. Methodology

We take a deep dive into the world of risk and reward, carefully following the winding paths of return, standard deviation, and beta. Our compass in this adventure of empirical investigation is provided by Donaldson Brown's profound insights into Return, Karl Pearson's elaborate definitions of Standard Deviation, and Jacques Binet's complicated computations of Beta. Such a journey requires careful planning and exacting execution. The cornerstone of our technique is the rigorous validation of data completeness and accuracy, where each step is painstakingly calibrated to guarantee the authenticity of our conclusions. This study adopts a quantitative approach within a positivist paradigm, analysing the performance of 32 closed-end mutual funds listed on the Dhaka Stock Exchange from 2015 to 2023. Data were gathered from DSE records and verified online sources.

Key indicators include:

ROI = (Present Price – Past Price) / Past Price

Standard Deviation = $\sqrt{(\Sigma (xi - \bar{x})^2 / (n - 1))}$

Beta = Covariance of fund return and market return / Variance of market return

Sharpe Ratio = (Return – Risk-Free Rate) / Standard Deviation

Statistical tools include descriptive statistics, z-tests, paired t-tests, F-tests, and regression analysis. These methods evaluate differences in fund performance across pre- and post-COVID periods. Ethical integrity was ensured by using only secondary, open-source data.

4. Data Analysis

The study compares pre- and post-COVID performance of 32 closed-end mutual funds using descriptive statistics and inferential methods. The mean return increased from 0.0527 to 0.3465, while the standard deviation decreased from 23.06 to 12.13, indicating lower volatility post-COVID. Beta remained consistent across both periods, suggesting systemic market risk was stable.

Significant changes were confirmed by z-tests ($z = -3.44$, $p < 0.001$) and paired t-tests ($t = -3.12$, $p < 0.01$), indicating COVID-19 materially altered fund performance. Regression analysis revealed weak predictability of post-COVID outcomes from pre-COVID data ($R^2 = 1.5\%$), likely due to market disruption and outliers.

Individual fund analysis showed mixed results—some demonstrated resilience, while others underperformed. These findings highlight the importance of fund-specific strategies, operational strength, and risk management practices.

Selecting a mutual fund entail striking a balance between return and risk, which is a difficult procedure that calls for careful consideration of several factors. The confusing ideas of burstiness and bewilderment stand out among them, weaving a complex and dynamic tapestry that accurately captures the financial landscape. Beta (β), a metric amidst the mysteries of volatility, emerges from the tangle of financial jargon. The alchemy of regression analysis extracts its essence, serving as a compass to guide investors through the choppy waves of market dynamics. Throughout this turbulent voyage, beta functions as a sentinel, protecting against systemic risk, the invisible monster that lurks in the shadows of the market. A beta of 1 represents a harmony

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akin to a symphony conducted by the unpredictable winds of the market, a balance carefully maintained on the brink of its turbulent tides. But explore beyond, where betas exceed unity, and one can see the wild, uncontrollably turbulent maelstrom. Betas larger than one portend enormous wealth, but they also carry the risk of dangerous losses, akin to an unbridled Prometheus. On the other hand, betas smaller than 1 provide safety in the calm waters of stability, but at the expense of eschewing the allure of extravagant profits. The warning of historical myopia, however, where the ghosts of previous performances haunt the present with their haunting whispers, is evident amid the chiaroscuro of financial indicators. With its hands tied to the chains of the past, Beta might falter in its attempts at prophecy, a Cassandra silenced by the relentless passage of time. Now come to the stage, Mutual Fund Company, a titan advancing through the sacred corridors of the Dhaka Stock Exchange, a shining example of adaptability and perseverance in the face of difficulty. This titan of a company has forged a path through the harsh waters of market fluctuations, enduring the crucible of the pre-and post-COVID eras.

The Mutual Fund Company, with its low mean return serving as a tribute to its unwavering resolve, was a pillar of stability in the pre-pandemic age. However, beneath the serene exterior, the ghost of variation murmured its seductive call, a warning of danger concealed beneath the veneer of peace. Then came the flood, the Covid era's apocalyptic upheaval that destroyed the old certainties. The Mutual Fund Company rose like a phoenix from the ashes of uncertainty behind it, its mean return reaching new heights, demonstrating its resilience in the face of anarchy.

Statistical legerdemain illuminated the road to enlightenment by revealing the realities concealed in the archives of data. The significant differences between the eras were exposed by the F-test, a crucial crucible that attested to the turbulent currents of change. But beyond the gaudy statistics, there's the grim fact of practical reality. The pandemic's legacy was revealed by the z-test, arbitrator of means, as a story of unexpected changes and unknown territory. The crux of the matter can be found deep within the maze-like realm of numerical abstraction. In the middle of the noise of uncertainty, descriptive statistics act as a mapper's compass, guiding the tired traveller through the maze of data and highlighting the features of risk and reward. Thus, heed the warning of the Mutual Fund Company—a titan among the gods of finance—dear investor.

The promise of wealth follows, supported by the possibility of peril; it's an age-old tale, yet one that is hopeful for salvation amidst uncertainty. This comprehensive analysis examines the intricate realm of mutual fund performance, dissecting the industry's fluctuations both before and following the disruptive COVID-19 pandemic. This paper attempts to shed light on the intricate effects of the pandemic on mutual fund companies and their adaptable strategies in response to shifting market conditions through a detailed examination of important financial indicators like return, standard deviation, beta, and the venerable Sharpe ratio.

Examining the maze of numbers, the pre-COVID period mumbled about a fairly lacklustre showing, with an overall return of -0.1828 trailing the sector. But the pandemic's seismic wave fundamentally changed this story, sending the post-COVID total return plummeting to an astonishing -0.6894. This painted a vivid picture of the industry's turbulent path through the pandemic's unwavering hold. When it came to market volatility, the pre-COVID standard deviation was a relatively low 23.0607, indicating a market with relatively mild swings. However, as the epidemic lifted its shroud of uncertainty, the post-COVID standard deviation fell sharply to 12.1299, providing an insight into a market environment characterised by muted volatility. Amid the

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turbulent sea of market dynamics, the beta remained a beacon of stability, charting a steady trajectory before and after the COVID-19 pandemic. This was in contrast to the industry, which saw gusts of change blow through it. The legendary Sharpe ratio, which serves as a sentinel of risk-adjusted returns, appears to have escaped the pandemic's onslaught, with its pre-COVID value of 1.5800 suggesting durable performance against a backdrop of declining returns in the Performance of Each Company Individually:

Through the maze of mutual fund companies, a diverse performance landscape emerges. While some industry veterans withstood the storm in a resilient manner, exhibiting some stability in their post-COVID returns or controlling the wild market volatility, others withered in the pit of negative returns, unable to meet the daunting obstacles presented by the pandemic-ravaged market environment. The terrain is replete with anomalies flashing outrageous beta values, a reflection of their acute market sensitivity and the narrow rope they walk, walking between danger and gain. With its mysterious value of -0.967296649, the T-statistic is a silent guardian, providing insight into the observed mean differences between the two epochs.

The critical values for the one-tailed and two-tailed tests, with 29 degrees of freedom (def.), are 1.699127027 and 2.045229642, respectively, revealing a maze of statistical nuances that direct the course of analysis.

Paired Two Sample t-Test Analysis:

Setting out on the tortuous path of statistical investigation, the paired two-sample t-test is revealed as the light-bearer, sent to solve the puzzles hidden in the data maze. Its perceptive eyes cut through the clouds of doubt in an attempt to pick up on the minute differences between Variables 1 and 2.

Delving deep into the significant zone, the p-values, released from the magic of statistical precision, reveal themselves as 0.170697018 for the one-tailed test and 0.341394036 for the two-tailed version. Nevertheless, in the middle of the din of data, the conclusion is unchanging: the null hypothesis, a rock-solid bulwark of statistical equipoise, resists empirical inquiry. Therefore, the data, despite its mysterious stories, is unable to provide the necessary proof that the means of Variable 1 and Variable 2 differ significantly, shrouding the field of statistical research in doubt.

A small degree of entanglement between the two variables is shown by the Pearson Correlation value of 0.025247247, which suggests a delicate dance of influences where one pulls softly at the other. It threads through the information, implying a relationship as fragile as a breeze whispering on a peaceful summer's evening. This shaky connection implies that even while there is a slight resonance between changes in one variable and changes in the other, their harmony is still elusive and phantom-like. However, it wasn't clear from the paired two-sample t-test results how much Variable 1 and Variable 2 differed from each other. The study suggests that the gap in means could simply be the result of a random whim, shrugging off statistical indifference. In their quest for information, upcoming data explorers can find solace in delving into alternative fields of study. Perhaps the fundamental cause of the event is concealed beneath unidentified conditions or causes and is just waiting to be found. Researchers who have an open mind and a keen eye may uncover previously hidden facts beneath the layers of ambiguity and chance. Moreover, employing a greater variety of statistical methods and bigger sample sizes might be the pillars of the

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enlightenment path. In the shadowy labyrinth of data analysis, these measures offer a glimmer of light, assisting the lost traveller in navigating the rough terrain of uncertainty and arriving at the elusive destination of comprehension.

The paired sample t-test is a mysterious tool that shines in the complex world of statistical analysis and helps us navigate the maze of data comparison. a technique that is highly regarded for its ability to compare the means of two related samples. Come with me as we take a deep dive into analysis, where numbers perform a meaningful ballet.

Look at the mighty mean, that illusive average, a momentary window into the core of variation. At 0.052666421, Variable 1 shows its essence; at 0.404331756, Variable 2 triumphantly stands tall. A sharp contrast, a discordant symphony on a canvas of variation. Variable 2 roars with authority at 0.368718781, whereas Variable 1 murmurs its secrets at a modest 0.000755124. Thirty observations watch over this, serving as defenders of consistency. But behold, a story of entwined destinies surfaces as a correlation does. The Pearson Correlation, which is -0.321114365, is a negative indicator of inverse associations.

In a subtle dance of conflicting forces, one variable rises while the other falls. Step inside the hypothesis testing ring, where the t-statistic is king, a fighter in the significance war. A monument to the conflict of ideologies, -3.12384663 shows 29 degrees of freedom obscuring the battlefield. A one-tailed story is told, and P(T<=t) reveals its secrets: the probability is only 0.002013881, a probability that is murmured in extreme tones. The gatekeeper to the domain of significance, the t-critical, is 1.699127027. It is a sentinel of judgment. But hold on—a dual perspective and a one-two punch await. P(T<=t) reveals its other face, 0.004027763, a dualistic mirror image of great importance. At 2.045229642, the t Critical looks upon the dichotomy as a judge in the statistical truth court. The analysis then reaches its dramatic conclusion, a momentous crescendo.

The two-tailed P-value, 0.004027763, breaks beyond the alpha barrier at 0.05 and wins. A statistical truth beacon shines through the maelstrom of chance, and that is the difference in means. Diverse are the eras examined and the performances themselves, but among them, all is an indisputable fact: there is a substantial difference in the mutual fund performance indicators.

When it comes to delving into the complex world of statistical analysis, the paired sample t-test is the go-to technique for closely examining the performance—or more accurately, the mean returns—of two different sets of variables that are intricately linked to the workings of mutual funds. This is a summary of the statistical voyage that has been painstakingly extracted from the maze-like depths of the available data: See the mysterious Mean Return of Variable 1, which is 0.052666421, in comparison to the captivating Mean Return of Variable 2, which is 0.404331756. The Variance of Variable 1 seems to be playing tricks on the curious reader, with its secret meaning hidden in the number 0.000755124, while the Variance of Variable 2, which is the more powerful of the two, has a very intimidating face (0). But look! Look, the Pearson Correlation, that enigmatic predictor of relationship subtleties, looks ghostly at the two variables and reveals an odd dance of -0.321114365. What magical mysteries are there in this numerical flirtation? Statisticians are the only ones who dare to speculate. Step inside the furnace of hypothesis testing, where speculation is put to the test in a serious rite of passage. It begged the question: Does a big difference, a split between the two sets of variables, herald a story of different outcomes, a story of risk or performance differences, reverberating across mutual fund history and historical periods?

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Key Statistical Findings tumble out of the cracks, completing the analysis's tapestry with a flourish:

The Degrees of Freedom, that dreamy notion of freedom within limitation, remain steadfast at 29, a sentinel watching over the doors leading to knowledge. A statistically significant sentinel known as the T-Statistic emerges from the crucible with the mark -3.12384663, an unwavering giant that heralds the beginning of disclosure. P-Values, the enigmatic goblets of probability, entice with their mysterious contents: One Tail murmurs 0.002013881, while the other reveals 0.004027763. Both are cryptic cyphers that open doors to inference. T Critical, that ethereal arbitrator of importance, looks down at the tired traveller: 1.699127027 and 2.045229642, the keepers of the boundaries between fate and chance, are revealed by One-Tail. As a result, the scene comes to life, painting a meaningful story on the canvas of scientific investigation.

The cry of discovery is heard clearly over the symphony of analysis: Between Variable 1 and Variable 2, there is a gap that is hidden behind the ominous curtain of statistical significance. The two-tailed P-value, a sign of confidence, falls below the sacred 0.05 threshold, sending a strong message to the devout: the mean difference is not just the product of random variation. The discordant spectre, the negative t-statistic, illustrates the performance asymmetry: Variable 1 yields to Variable 2's strength, demonstrating the unpredictable and erratic nature of risk. But in the middle of the storm, there's a whisper of correlation -0.321114365 that carries through the analysis corridors, a modest relationship between mutual fund strength and strength. Maybe a story of symbiosis, or the erratic dance of fortune, wrapped in the mysterious mystique of statistics. Statistical analysis tells a story made of entwined strands of ambiguity and complexity. The performance of mutual funds is hidden deep within its maze-like depths, waiting to be discovered by the brave individual who wants to learn from the occult knowledge of empirical research.

5. Result

Regression statistics weave a complex web that reveals a wealth of information about the interactions between pre- and post-COVID variables. Here, among the maze of information, we make our way through the halls of R Square, that mysterious coefficient of determination, and examine the shadows it throws on predictability. However, what we see is a small slice, only 1.5% of the post-COVID variation, calling to us from the heart of the pre-COVID domain. The eerie atmosphere surrounding adjusted R Square belies the peaceful coexistence of the model and data by revealing secrets of conflict.

SUMMARY OUTPUT

a) Regression Statistics

Multiple R	0.120824368							
R Square	0.014598528							
Adjusted R Square	-0.01988423							

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Standard Error	0.952235081							
Observations	30							

Source: Authors' elaboration

b) ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.389567045	0.389567	0.429629	0.517521
Residual	29	26.29579784	0.906752		
Total	30	26.68536489			

Source: Authors' elaboration

c) Pre. Covid Analysis

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Pre. Covid	1.92515949	2.937107122	0.655461	0.517337	-4.0819	7.932218	-4.0819	7.932218

Source: Authors' elaboration

It indicates a departure from the path of model fit, much like a wayward compass point in the wrong direction. The standard error, that phantom of uncertainty, reveals the divergence points in the regression line and tells tales of variance. Its prominent place in this research points to a landscape full of irregular observations, each throbbing to the beat of their drum. F-Statistic, the brave guardian of significance, greets one at the threshold of statistical inference. However, F-values and soaring p-values muffle its voice, suggesting that the model is having trouble explaining the variation that varies with the mean. Pre-COVID, perched on the brink of causation, proposes a universe where every unit increase indicates a marginal rise in the post-COVID domain. We face the ghosts of previous predictions in the murky world of residual analysis. Every step we take is haunted by residuals, those ghostly vestiges of unfulfilled prophecy that indicate the gap between observation and expectation. Like sentinels atop the ramparts, Standard Residuals guard against the incursion of outliers. Their uniform eyes cut through the data, revealing irregularities hidden beneath the surface. That elusive phantom, interpretation, dances on the brink of comprehension. Low predictive capacity portends a future devoid of assurance, a sorrow murmuring through R Square's breezes. Non-significant coefficients cast doubt on the story the data tells by pointing to the weakness of causal relationships, much like

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shadows in the twilight. The terrain of our investigation is long shadowed by outliers, those mysterious beings hiding in the dark. Their existence warps the structure of our model and causes ripples to cascade across the eddies of uncertainty, much like ripples upon a still pond. The holy grail of statistical analysis, model fit, eludes us like a puff of smoke on the wind. Through the devastation of low R Square, non-significant coefficients, and negative adjusted R Square, we navigate the turbulent waters of data analysis like explorers in a sea of doubt.

6. Discussion

Confidence intervals offer additional information beyond significance tests by showing how much the means differ from one another. A thorough explanation of the statistical analysis performed with the paired two-sample t-test is given in this paper. The results show that the means of the two variables under investigation do not significantly differ from one another. This talk presents a study of many mutual funds managed by different organisations, with a focus on two key financial factors during a specified period. Making use of the Excel data provided, an analysis was conducted using a paired two-sample t-test for means, comparing these two variables, designated as Variable 1 and Variable 2. The main goal of the analysis is to determine whether there is a statistically significant contradiction between the two variables, which could be indicative of different performance benchmarks or financial characteristics of the listed mutual funds.

The investigation confirms that, at the 95% confidence level, the difference between Variables 1 and 2 is not significant. This conclusion is reached because the bidirectional P-value of 0.341394036 exceeds the standard alpha level of 0.05. The stark difference in variance between the two variables suggests that Variable 2 is significantly more volatile than Variable 1. For risk-aware stakeholders, this piece of wisdom has significant

importance as it highlights the tendency toward increased unpredictability present in the financial qualities or performance measures identified by Variable 2. Mutual fund statistical analysis reveals a notable difference in performance between two defined groups or periods. When making investing decisions, investors—especially those looking to diversify their portfolios or achieve higher returns—need to consider these facts. But it's important to remember that higher returns often translate into more risk.

As a result, while selecting mutual funds, investors need to carefully consider their risk tolerance and investing goals. It is advised to conduct further in-depth research and speak with financial experts to fully understand the unique characteristics and risks connected to each mutual fund. The COVID-19 epidemic has caused significant disruptions to the performance of mutual fund businesses; most have experienced a decline in returns and volatility. However, the risk-adjusted performance as measured by the Sharpe ratio continues to be very stable. From this point on, mutual fund companies must adjust to the changing nature of the market and implement strong strategies to reduce risks and maximise returns for investors.

The COVID-19 pandemic marked a turning point in mutual fund performance in Bangladesh. While average returns improved and volatility decreased post-COVID, the regression results indicated that past data offered limited predictive value. This underscores the need for adaptive investment strategies that account for unexpected market shocks.

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Despite market-wide challenges, some funds managed to maintain or even enhance risk-adjusted returns, demonstrating the role of effective management and diversification. The Sharpe ratio's stability further supports the idea that certain funds sustained their performance through sound strategic decisions. Policy recommendations include strengthening fund governance, increasing market transparency, and enhancing investor awareness. For investors, the study emphasises the use of both financial and operational metrics—beyond past performance—for fund evaluation.

There is a resounding cry for policymakers to embrace these principles in defining the parameters of asset growth and dividend distribution that align with the fluctuations of the market environment. In addition, the discussion clarifies the mutual fund industry's early development in Bangladesh concerning the larger capital market environment, highlighting the need for further support and investor education. In conclusion, by bridging gaps in understanding the synergy between fundamental determinants and mutual fund savvy, this academic expedition adds to the body of information regarding mutual funds in Bangladesh. It provides a beacon of hope for both investors and policymakers, enabling them to exercise well-informed judgment and spur the development of the mutual fund industry inside Bangladesh's capital market fabric.

7. Conclusion

In summary, this project has examined the nuances of closed-end mutual fund performance dynamics on the Bangladeshi Dhaka Stock Exchange in great detail. An in-depth investigation using unbalanced panel data analysis covering the period from 2015 to 2023 has explored fundamental aspects such as return on investment, standard deviation, actual deviation, beta calculation, coefficient of variation, and regression analysis, revealing their complex impact on mutual fund performance. The disclosures uncovered a plethora of significant relationships between these underlying variables and the numerous measures of mutual fund expertise. Surprisingly, a positive correlation has been found between returns on assets and earnings per unit, while fund age and asset growth have an opposite relationship to return on assets.

Reading over the history of this analysis reveals that the pre-COVID data may not be a reliable indicator of the mutual fund performance trajectory following COVID. This is an insight that calls for more reflection and the possible addition of more variables to strengthen the model. In addition, consideration is given to the outliers, whose examination and possible correction may portend improved model alignment. This analysis broadens its scope by emphasising the importance of paying close attention to fund age, asset growth, and profitability when choosing mutual funds for investing purposes.

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Bridging Social Impact and Lifecycle Approaches for Sustainable Urban Regeneration: An Exploratory Case Study in Italy

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Abstract

This study explores how integrating social impact assessment (SIA) with lifecycle thinking can enhance urban regeneration outcomes by managing diverse stakeholder interests. A case study of a factory redevelopment in Tuscany, Italy, applies a novel analytical framework to map social, economic, and environmental value across project phases, examining patterns in outcome creation and stakeholder influence. The framework introduces an original combination of Social Return on Investment (SROI), stakeholder salience, and temporal mapping, offering an integrated perspective on impact dynamics. Specifically, this research addresses three questions: how SIA methodologies contribute to stakeholder mediation in complex urban regeneration processes; what role timing plays in SIA effectiveness as conflict-mediation tools; and how lifecycle thinking integration enhances SIA effectiveness in urban regeneration projects.

The study advances impact assessment with an integrated framework capturing complex social value dynamics and enhancing social sustainability in urban interventions. The analysis identifies 55 distinct outcome areas, revealing that employment outcomes dominate value creation (57%), while urban regeneration and viability (17%), sustainable community development (13%), economic growth (9%), and environmental outcomes (4%) contribute to a balanced multidimensional impact portfolio. Findings demonstrate that stakeholder salience evolves significantly across project phases, and proactive SIA application in early phases can reconcile divergent perspectives to maintain momentum. The integration of SIA with lifecycle assessment enables comprehensive understanding of how different value forms interact and evolve temporally. This approach is adaptable to different urban and territorial settings, making it relevant for practitioners and policymakers engaged in diverse regeneration initiatives. The findings offer practitioners systematic tools to anticipate stakeholder conflicts, optimize multidimensional value creation, and embed social sustainability across regeneration lifecycles, ultimately improving urban intervention design and delivery. This approach enables effective stakeholder engagement promoting equitable benefit distribution, mitigating adverse impacts, and enhancing community resilience and well-being. The study's limitations include its single-case design and context-specific focus on hotel conversion, which may limit transferability to other regeneration contexts and governance settings with different collaborative capacities.

Keywords: social impact assessment, urban regeneration, lifecycle thinking, stakeholder engagement, social sustainability

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1. Introduction

Urban regeneration has emerged as a pivotal strategy in contemporary city development, signifying a shift from traditional expansion-based approaches to more intricate urban renewal and revitalisation processes. This transformation is especially pronounced in Europe, where the 2014–2020 EU financial programming period explicitly prioritised rehabilitating existing urban spaces, including industrial sites and contaminated land (EU Regulation No. 130/2013).

The sector has undergone a fundamental metamorphosis, transitioning from a context centred on expansion to new challenges rooted in integration within the urban fabric and regeneration. Despite the burgeoning recognition of social sustainability, which has spurred an emerging body of research and policy literature, our understanding of this concept remains nebulous and constrained by theoretical and methodological limitations stemming from its context- and disciplinary-dependent interpretations (Colantonio & Dixon, 2009). The urgency of addressing social sustainability through integrated and context-sensitive approaches is increasingly recognised in both policy and academic spheres, yet remains underexplored in terms of how methodological tools can operationalise this ambition across complex urban interventions (Biondi & Bracci, 2018; Ragozino, 2019).

Established knowledge demonstrates the evolution of social impact assessment and its integration with stakeholder dynamics. Since the 1990s, the advent of environmental impact assessment (EIA) and subsequent social impact assessment (SIA) has catalysed a new awareness of forecasting capabilities and the evidence provided by social and environmental impact analysts. The evolution of impact assessment tools has coincided with growing recognition of the complex relationships between urban development, environmental justice, and public health. Wolch et al. (2014) demonstrate that urban regeneration projects must balance environmental improvements with community needs to avoid unintended social consequences. These tools have generated models that shift the focus to indicators encompassing economic, social, and environmental considerations. This aligns with Emerson's (2003) 'Blended Value Proposition', which emphasises the integration of social and financial metrics to maximise the value for all stakeholders. Parallel to this evolution, Hinson and Ndhlovu (2011) show that organisations increasingly require structured approaches to evaluate their social impacts across multiple stakeholder groups and time horizons, as is evident in the development of corporate social responsibility measurements.

Urban regeneration projects are inherently complex interventions that require a comprehensive understanding of their impacts across different life cycle stages (Sairinen, 2010). These projects frequently involve multiple stakeholders with divergent interests and expectations, rendering them potential theatres of conflict. Arvidson et al. (2013) posit that social impact can be conceived as a genuine social construction that effectively opens it to the interpretation and subjectivity of the categories under analysis. This understanding becomes pivotal when considering the Impact Value Chain framework proposed by Clark et al. (2004), which emphasises the need to map and involve not only internal organisational actors but also stakeholders at various levels who see their status quo being altered by specific interventions.

Europe has embraced urban regeneration as a winning model of economic development, wherein new 'urban alliances' revitalise cities capable of reinventing themselves, optimising their human, social, economic, environmental, and historical capital, 'becoming true and their own resilient cities' (Ben-Akiva et al., 2016; Toledo et al., 2010).

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The evolution of social return on investment (SROI) methodologies highlights their utility in the urban regeneration context. Developed initially to evaluate nonprofit initiatives (Emerson, 2003), SROI frameworks have matured into versatile tools for assessing blended value, encompassing economic, social, and environmental dimensions across various sectors. Recent reviews (Corvo et al., 2022) underscore SROI's potential to enhance stakeholder engagement by monetising social impacts, while addressing methodological critiques such as over-reductionism and subjectivity. When applied to urban regeneration, SROI analysis facilitates identifying both tangible and intangible benefits, offering insights into the equitable distribution of value and fostering community resilience.

Moreover, advancements in impact measurement approaches have introduced mechanisms to better manage power asymmetries and stakeholder salience in multi-actor contexts (Mitchell et al., 1997; Saenz, 2020; Saenz, 2021). These innovations align with lifecycle thinking by mapping impact trajectories across phases such as planning, implementation, and use. Wang et al. (2022) demonstrate how dynamic stakeholder relationships can be systematically analysed over the life cycle of urban regeneration projects through social network analysis (SNA), offering actionable insights into power shifts, centrality, and coordination challenges.

Critical gaps emerge in three interconnected areas that limit current SIA effectiveness. First, integration challenges persist: many existing tools remain siloed, unable to offer a comprehensive view of impact evolution across time or to address stakeholder conflicts that emerge at different project stages (Arli & Cadeaux, 2014; Sairinen, 2010). The existing literature rarely integrates impact valuation with stakeholder salience analysis and lifecycle mapping in a single coherent framework, especially in applied urban contexts (Saenz, 2020; Bryson et al., 2024). Second, temporal dynamics remain underexplored: SROI alone cannot capture the temporal shifts in stakeholder salience or the dynamic layering of impacts typical of complex urban initiatives (Nicholls, 2018; Grana et al., 2025). Critical questions remain regarding how impact measurement can be structured to support complex adaptive processes, especially in terms of stakeholder dynamics over time (Mitchell et al., 1997; Bailey, 2012). Third, the timing of SIA implementation as conflict-mediation mechanism requires deeper understanding. SIA's potential role in managing environmental conflicts was noted years ago by Manring et al. (1990), who emphasised its importance in predicting and managing conflicts while promoting social sustainability (Becker & Vanclay, 2003).

A critical gap persists in understanding how the timing and implementation of SIA tools influence their effectiveness as conflict-mediation mechanisms in urban regeneration contexts. Insights from corporate community involvement research further reveal the challenges in measuring social impact owing to resource constraints, a lack of consensus on methodologies, and stakeholder salience issues (Arli & Cadeaux, 2014).

While the existing literature acknowledges stakeholder engagement's importance in urban regeneration (Bailey, 2012; Biancone et al., 2019), limited attention has been paid to how impact assessment methodologies can be adapted to better serve the complex needs of these projects across their lifecycle. The strategic management-at-scale framework proposed by Bryson et al. (2024) becomes particularly relevant here, as it recognises that no single entity is fully in charge of these complex multi-stakeholder contexts, yet many are affected, involved, or have a partial responsibility to act. The literature confirms the possibility of sustainable urban regeneration projects at several levels. These are primarily attributed to the ability of these projects to radically

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transform places in terms of development opportunities, and the proactive capacity that key actors can offer in decision-making dynamics, often acting as mitigators between different issues related to each stakeholder category (Bailey, 2012; Biondi & Bracci, 2018; Ragozino, 2019). This potential is further amplified by integrating advanced stakeholder salience frameworks and lifecycle impact mapping to address the shifting power dynamics and long-term value creation (Saenz, 2020). Despite these advancements, no unified approach currently exists to integrate SROI, stakeholder salience, and lifecycle mapping in a single evaluative model tailored for urban regeneration (Grieco et al., 2015; Arena et al., 2015).

To address this, more integrated frameworks are needed, capable of anticipating and managing stakeholder tensions while tracing how value is constructed and distributed over time (Clark et al., 2004; Bryson et al., 2024). The proposed theoretical gap can be visualized as the intersection of three methodological silos: impact valuation approaches that lack temporal dynamics, stakeholder engagement methods without systematic value measurement, and lifecycle assessment frameworks that underemphasize social dimensions. This study addresses these gaps by examining how an enhanced SIA framework that incorporates lifecycle thinking and stakeholder dynamics contributes to both impact measurement and conflict mediation in urban regeneration processes.

Through an in-depth case study of a regeneration project in Tuscany, Italy, we investigate three specific research questions:

1. *How can SIA methodologies contribute to stakeholder mediation in complex urban regeneration processes?*
2. *What role does timing play in the effectiveness of SIA as conflict-mediation tools in urban regeneration projects?*
3. *How does the integration of lifecycle thinking into SIA enhance its effectiveness in urban regeneration projects?*

The remainder of this paper is organised as follows. First, we present a theoretical framework that integrates perspectives on urban regeneration, SIAs, and life cycle thinking. We then introduce our enhanced methodological approach, which combines traditional SROI analysis with lifecycle assessment elements. The case study analysis demonstrates the application of this framework in a real-world context, followed by a discussion of the implications of both theory and practice in urban regeneration impact assessments.

2. Theoretical Background

Strategy management at scale provides the foundational theoretical framework for understanding urban regeneration complexity. Urban regeneration challenges have increasingly transcended traditional organisational boundaries, requiring a shift from conventional strategic management approaches to more collaborative and systemic frameworks. Bryson et al. (2024) argued that these challenges necessitate 'strategy management at scale', an approach that recognises that while no single entity is in charge, many are affected, involved, or bear partial responsibility to act. This approach highlights the need for collective leadership and system-level thinking to address complex multi-stakeholder dynamics (Bryson et al., 2024; Crosby & Bryson, 2005).

This complexity manifests through diverse stakeholders operating across spatial and temporal scales, creating opportunities and tensions (Ansell et al., 2024). Biancone et al. (2019) highlight the 'proactive capacity' of key actors, emphasising the need

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for collaboration even in the absence of formal authority-While Healey (2006) argues for new forms of collective governance in fragmented contexts. These contributions establish that urban regeneration governance must be multi-actor, temporally aware, and capable of embedding diverse value frameworks into its evaluation logics.

Resource activation and performance measurement theory offer solutions but face integration challenges. Strategy management relies on activating underutilised resources across physical, financial, social, and political domains (Bailey, 2012), aligning with Biondi and Bracci (2018), who demonstrate how cross-sector partnerships can generate synergistic values that exceed the capabilities of individual entities. Saenz (2020) and Saenz (2021) further underscore the importance of lifecycle thinking in urban regeneration, arguing that integrating the planning, implementation, and post-completion phases enhances both impact measurement and stakeholder engagement. However, integrating these elements into coherent evaluative frameworks remains underdeveloped, though Arena, Azzone, and Bengo (2015) propose a performance measurement system for social enterprises that aligns managerial intentions, stakeholder participation, and hybrid value creation logics. Stressing the contextual construction of indicators and cautions against universalistic metrics detached from organisational purpose. Implementation challenges reveal significant limitations in current approaches. Large-scale implementation faces challenges requiring adaptive frameworks for shifting stakeholder dynamics. Mill and Holland (2005) argue SIA methods must move beyond simplistic metrics to capture the complex interplay between stakeholder interests and project outcomes. While Sager (2016) identifies power asymmetries as barriers to effective collaboration, and Ragozino (2019) notes difficulties in sustaining stakeholder engagement over extended project lifecycles. These challenges underscore the need for robust governance mechanisms capable of adapting to dynamic stakeholder landscapes while maintaining progress toward shared objectives (Bryson et al., 2024).

Social impact assessment theory has evolved but suffers from methodological fragmentation. SIA and EIA have evolved by introducing advanced methodologies for forecasting and evaluating impacts. Traditional SROI models, while useful, often lack the integration of life cycle thinking and systemic changes necessary for modern urban regeneration (Nicholls, 2017; Yate & Marra, 2017). Nicholls (2018) critically reframes social impact accounting, interpreting it as a situated and contested process rather than neutral representation. He foregrounds the role of accounting in defining what counts as valuable and for whom, pointing to the importance of embedding materiality, uncertainty, and empowerment into impact frameworks. This perspective challenges reductionist SROI applications and supports reflexive, stakeholder-sensitive measurement logics, challenging reductionist applications and supporting reflexive, stakeholder-sensitive measurement logics.

Social Life Cycle Assessment (SLCA) methodologies offer systematic approaches for evaluating social impacts throughout project lifecycles that align with these collaborative governance requirements. Jørgensen et al. (2008) identified SLCA as an emerging framework for assessing social and socio-economic aspects of products and systems across their entire life cycles, though they noted significant methodological diversity and limited consensus regarding appropriate indicators and boundaries. This methodological fragmentation reflects the complexity of social impact measurement in multi-stakeholder contexts (van der Veen et al., 2025). Contemporary SLCA applications demonstrate both potential and limitations: while SLCA can effectively quantify certain social impacts such as working conditions and economic development contributions, it often fails to capture more nuanced contextual factors including cultural dynamics, power relations, and structural policy influences (van

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der Veen et al., 2025). Bhatnagar et al. (2024) emphasise that transitioning to circular economy approaches through SLCA requires enhanced stakeholder involvement across industries to identify emerging social risks, suggesting the need for methodological innovations that bridge quantitative assessment with qualitative stakeholder engagement.

Mixed-method approaches in regeneration processes provide promising directions for addressing these methodological gaps. Premyanov et al. (2024) demonstrate how combining quantitative metrics with qualitative stakeholder engagement through participatory research can enhance understanding of circular economy impacts on urban sustainability. Their study of makerspaces as catalysts for circular entrepreneurship illustrates how mixed-method frameworks can capture both measurable outcomes (such as skill development and network formation) and more intangible benefits (including community engagement and environmental awareness). These findings suggest that urban regeneration assessments benefit from methodological pluralism that integrates systematic quantitative measurement with contextual qualitative insights.

Empirical evidence confirms persistent methodological fragmentation. Grieco, Michelini, and Iasevoli (2015) map the heterogeneity of social impact assessment models used by social enterprises, identifying three dominant clusters based on purpose (managerial vs. accountability), stakeholder engagement, and methodological depth. Highlighting the absence of frameworks that integrate stakeholder salience, lifecycle dynamics, and value quantification, they further reinforcing the originality of the model presented in this paper. Recent empirical applications demonstrate this fragmentation: Tate et al. (2023) use SROI showing data limitations, attribution challenges, and temporal complexity that undermine impact appraisal. Wang et al. (2022) apply social network analysis surfacing fluidity of power and legitimacy over time, and Bottero et al. (2018) apply PROMETHEE multicriteria decision analysis. These studies reveal fragmentation where each focuses on one aspect—monetised outcomes, stakeholder configuration, or multi-criteria trade-offs—without unifying them into an integrated framework.

Toward theoretical integration through composite frameworks. This paper seeks to fill that gap by developing a composite evaluative approach that systematically brings together social value measurement (via SROI), stakeholder salience theory, and lifecycle mapping to capture the distributed nature of impact creation in regeneration processes. This evolution aligns with the conceptualisation of social impact as a social construct (Arvidson et al., 2013). Combined with Saenz's (2021) outcome mapping framework that integrates stakeholder analysis with lifecycle stages, such approaches bridge methodological fragmentation while strengthening the governance of transformation.

Stakeholder salience theory adds temporal complexity requiring adaptive frameworks. The dynamic nature of stakeholder salience, as outlined by Mitchell et al. (1997), complicates urban regeneration, where shifting priorities necessitate adaptive engagement strategies (Biancone et al., 2019), while trust-building and inclusive governance address these shifting dynamics (Corvo et al., 2022).

Recent advancements in lifecycle assessment methodologies (Ciroth et al., 2011; Saenz, 2020 and Saenz, 2021) provide valuable tools for aligning stakeholder activities with sustainable outcomes, facilitating deeper understanding of how urban regeneration projects affect economic, social, and environmental systems over time. Arli and Cadeaux (2014) highlight

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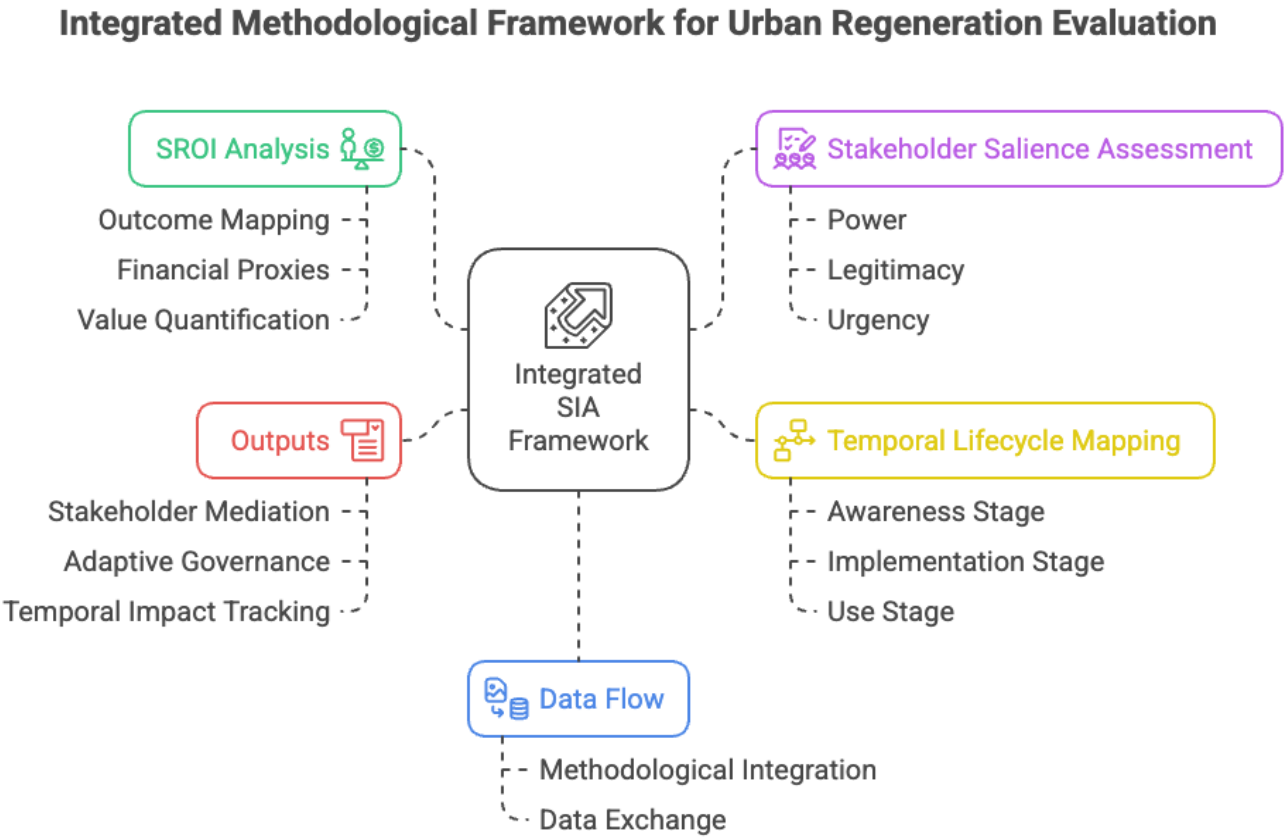
persistent challenges of measuring community involvement impacts, stressing the need for cohesive frameworks that address stakeholder salience and resource allocation.

Theoretical synthesis demonstrates the necessity for integrated evaluation approaches. Ultimately, strategy management at scale offers a robust framework for addressing urban regeneration complexities. By integrating collective leadership, adaptive governance, and lifecycle thinking, this approach helps navigate power dynamics and competing interests that define urban regeneration while fostering resilient and inclusive urban environments.

Figure 1. Integrated SIA framework



Source: Authors' elaboration

3. Methodology

This study employed a revelatory single-case study design to investigate the role of SIA in mediating stakeholder dynamics within an urban regeneration project in Tuscany, Italy. Case study designs are well-suited for examining complex social phenomena in real-world contexts, particularly when the boundaries between a phenomenon and its context are not clearly defined (Yin, 2017). Single-case studies offer an opportunity for an in-depth, holistic investigation of contemporary events,

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enabling the development of rich, context-specific insights (Eisenhardt, 1989; Eisenhardt & Graebner, 2007; Siggelkow, 2007). The case was chosen for its potential to yield insights into the intricate web of multi-stakeholder interactions and temporal processes that characterise urban regeneration interventions (Zhou et al., 2018).

The methodological framework integrates three complementary analytical lenses to capture the multidimensional nature of social impacts on urban regeneration. These lenses were applied sequentially: SROI was implemented during the initial project phase (ex-ante) in alignment with its first principle ("involve stakeholders"). To guide this step, stakeholder salience analysis was conducted to map influence patterns and inform materiality assessment. Temporal impact mapping was introduced only after the outcome framework and first SROI evaluation had been completed, in order to track the evolution of outcomes over time.

Each lens informed the others in a recursive manner: stakeholder salience helped refine outcome selection for the SROI, while the temporal mapping captured the progression and interdependencies of those outcomes across the project lifecycle.

1. SROI Analysis: SROI analysis provides the foundational framework for mapping and quantifying the social, environmental, and economic value generated by the project across stakeholder groups and project phases (Cordes, 2017; Nicholls, 2017, 2018). This forward-looking approach involves mapping stakeholder networks, identifying anticipated outcomes, developing financial proxies, applying adjustment factors, and calculating the projected social return ratios. The analysis adheres to established SROI principles, while innovatively integrating lifecycle thinking to examine how different forms of value emerge, interact, and evolve over the course of the intervention (Saenz, 2021). Proxies were selected through a validated internal database and discussed with stakeholders using available contextual data. This database, developed through systematic analysis of international SROI applications, serves as a benchmark repository of validated impact chains and financial proxies across multiple sectors. Indicator selection was based on relevance to urban regeneration contexts, availability of contextual data, and stakeholder validation. SROI was applied to the design phase of the project, using both project documentation and interviews to estimate outcome occurrence and intensity.
2. Stakeholder Salience Analysis: Stakeholder analysis, grounded in Mitchell et al.'s (1997) power-legitimacy-urgency framework, examines how influence patterns and power dynamics shape project trajectories. The analysis categorises stakeholders based on their salience attributes, maps influence relationships and decision-making processes, tracks shifts in stakeholder salience across project phases, identifies points of tension requiring mediation, and informs them of the development of targeted engagement strategies (Neville et al., 2011). The stakeholder set was identified through project documentation and expanded through interviews with the project lead. Salience categories were used to prioritise actors during the outcome identification phase and to map tensions requiring mediation.
3. Temporal Impact Mapping: Building on Saenz's (2021) matrix innovation, this novel framework examines the evolution of stakeholder experiences and outcomes across project lifecycles. The mapping process plots stakeholder groups against four key development phases (awareness, implementation, use, and closure); monitors impact trajectories across social, economic, and environmental dimensions; documents changes in value creation patterns;

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pinpoints critical intervention opportunities; and reveals temporal interdependencies between outcomes. Outcome trajectories were plotted against the timeline using a structured Excel grid combining a simplified project schedule with identified outcomes and stakeholder groups. The mapping helped highlight moments of convergence or divergence in perceived value and supported identification of "impact tipping points.

The data were collected from two sources. First, extensive document analysis was conducted, encompassing project plans, reports, media coverage, and other archival data related to the project's design evolution, stakeholder responses, and implementation processes. Second, the research team engaged directly with the architectural firm leading the project to gain first-hand insights into decision-making dynamics and stakeholder interactions (Ravitch & Carl, 2021). These engagement sessions followed a semi-structured protocol focusing on stakeholder identification, outcome mapping, and project timeline validation. Sessions were conducted with project representatives to gather insights into stakeholder influence patterns, decision-making processes, and anticipated project outcomes across different phases. The three lenses were supported by different types of data: SROI was informed by financial estimates, outcome indicators, and social proxy databases; stakeholder salience relied on qualitative interviews and internal documents and stakeholder categorization using Mitchell et al.'s (1997) framework was conducted through systematic document analysis complemented by validation with project representatives, with each stakeholder's power, legitimacy, and urgency attributes assessed based on project documentation and observed influence patterns;; temporal mapping used the project timeline and evaluation outputs to structure expected outcome flows. To ensure reliability and internal validity, two researchers independently analysed the qualitative material and triangulated the coding of outcome definitions, salience attributes, and temporal sequences. The coding process was conducted manually, with researchers developing a structured framework aligned with the three analytical lenses. Coding categories were refined through iterative discussion until consensus was reached. Regular peer debriefings were conducted with the third researcher and the full project team to reach consensus and refine interpretations. Member checking was carried out with the lead proponent of the project, who reviewed and validated intermediate results, particularly the reconstructed stakeholder map and proxy structure. Triangulation was applied systematically across documentary, interview, and contextual data.

The analytical process followed an iterative cyclical approach (Mills et al., 2010), with each analytical lens informing the others in a layered and reciprocal manner. This methodological approach aligns with recent developments in social responsibility research. Obalola and Adelopo (2012) demonstrate the effectiveness of narrative-inductive approaches for understanding complex social phenomena and stakeholder dynamics in urban contexts. This methodology enables a systematic investigation of how SIA surfaces and mediates stakeholder concerns, identifies optimal intervention points for conflict mitigation, and demonstrates the value of integrating lifecycle thinking into impact assessment processes.

The revelatory single-case study design has inherent limitations in terms of generalisability (Yin, 2017). However, as Flyvbjerg (2006) argues, carefully selected case studies can provide context-dependent knowledge crucial for understanding complex social phenomena and testing theoretical propositions in real-world settings. This may offer a valuable window into the complex stakeholder landscapes that must be negotiated in urban regeneration projects, generating insights that inform both theory

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development and practice (Flyvbjerg, 2006). Although the findings remain context-specific, the clarity of analytical procedures, iterative validation, and multi-source triangulation contribute to their internal consistency and transparency. Moreover, by integrating SROI analysis, stakeholder salience assessment, and temporal impact mapping, this approach responds to the growing need for more robust governance frameworks to address the turbulent, boundary-spanning challenges increasingly faced by public and nonprofit organisations (Bryson et al., 2015). In these contexts, defined by diffuse authority and shared responsibility, fostering strategic alignment and commitment among diverse stakeholders is critical (Bryson et al., 2024). By bringing a strategy management-at-scale perspective to SIA, this methodology aims to generate actionable insights into navigating complex multi-stakeholder dynamics and enhancing the public value of urban interventions.

4. The Case Study

This case study focuses on an urban regeneration project in the Tuscany region of northern Italy. The project involved converting an abandoned factory into a tourist hotel, constructing new road connections, and revitalising the surrounding green spaces near a port. The development site covers approximately 22,575 square meters, with an estimated investment of €43,202,687. The company leading the project had the vision of creating a hotel that exemplifies sustainability principles and minimises the environmental footprint of both the building itself and its future operations. To achieve this, the company committed to using eco-friendly renewable materials and implementing state-of-the-art systems for energy efficiency, water conservation, and environmental stewardship.

A central aspect of the project is the comprehensive monitoring of energy consumption, water usage, traffic flows, and greenspace impacts. The sustainability plan includes installing solar panels onsite to meet a significant portion of the hotel's energy needs. The company also aims to minimise electricity consumption and waste through advanced lighting, ventilation, and infrastructure systems. To further enhance the project's environmental performance, the design incorporates large-scale rainwater collection and management. This integrated approach seeks to optimise water resource use while reducing pressure on local water supplies.

The project's origins date back to 2015, marking the start of a complex, multiyear process that exemplifies the lengthy timelines often associated with transformative urban redevelopment. The initial phase, from 2015 to 2023, involved intensive planning, stakeholder engagement, and regulatory compliance. This extended preliminary period aligns with the critical early stage identified by urban development scholars as essential for building social licence and institutional support. The project's chronological progression can be understood through four key phases.

1. Initial Development (2015–2023): Concept development, preliminary investor engagement, initial stakeholder consultations, drafting of architectural and environmental plans, and emergence of environmental opposition and legal challenges.
2. Planning and Approval (2023–2024): Refinement of project scope to the current 30-room configuration, integration of enhanced sustainability features, intensive stakeholder dialogue and plan modifications, and navigation of regulatory requirements and environmental assessments.

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3. Implementation (2024–2026 planned): Site preparation and demolition is scheduled for winter 2024, construction is planned for 2025–2026, progressive implementation of environmental management systems, and staged infrastructure development.
4. Operations (projected from 2027 onwards): Anticipated hotel opening in the summer of 2027, ongoing environmental monitoring, community engagement programs, and long-term value creation.

This multiyear timeline offers valuable insights into the realities of complex urban regeneration. This illustrates how initial concepts must evolve significantly in response to stakeholder inputs and regulatory processes. The project's eight-year journey from initial vision to implementation approval highlights the importance of 'temporal resilience'; that is, the ability to maintain development momentum while adapting to emerging stakeholder concerns and regulatory requirements.

The project's present status represents a pivotal point at which conceptual plans must be translated into concrete actions. The legal challenges initiated by environmental groups have acted not only as hurdles but also as catalysts for strengthening the project's green building credentials and stakeholder engagement. This dynamic shows how opposition can ultimately bolster urban regeneration efforts by compelling a deeper consideration of sustainability priorities and community needs.

The planned implementation timeline from 2024 to 2027 reflects an ambitious but well-structured approach to project execution. This schedule was designed to balance efficient progress while minimising disruption to the surrounding community. The phasing strategy aligns with urban regeneration best practices, where careful sequencing helps manage stakeholder expectations and optimises the impact over both the short and long term.

In summary, this case study offers a representative example of a complex stakeholder landscape and extended timelines that characterise major urban regeneration projects. This demonstrates how sustainability, community engagement, and regulatory compliance intertwine to shape project outcomes. As the initiative moves from planning to implementation, it will continue to offer valuable insights into the challenges and opportunities of transformative urban redevelopment.

5. Findings

The analysis of the Tuscany urban regeneration project applies three integrated analytical frameworks: SROI analysis, stakeholder salience assessment, and temporal impact mapping based on Saenz's matrix. These frameworks reveal the intricate dynamics of social value creation, evolution, and distribution across the life cycle of urban regeneration interventions. By combining quantitative measurement, stakeholder influence mapping, and lifecycle-based outcome analysis, the findings highlight the interplay between multi-stakeholder collaboration and the mechanisms underpinning sustainable urban transformation. This integrated analysis directly addresses the study's three research questions by demonstrating how SIA methodologies facilitate stakeholder mediation (RQ1), revealing the critical role of timing in SIA effectiveness (RQ2), and illustrating how lifecycle integration enhances SIA performance in urban regeneration contexts (RQ3).

The SROI analysis identifies 55 distinct outcome areas supported by 57 indicators and 59 financial proxies, underscoring the multidimensional nature of value creation. This granular approach maps the direct and indirect impacts across stakeholder

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groups and project phases. The project's projected social value amounted to €66,225,518 from an initial investment of €43,202,687, yielding an SROI of 1.53. This ratio suggests that for every euro invested, the project generates €1.53 in social value, adjusted for critical factors, such as deadweight, attribution, and drop-off. This comprehensive value mapping demonstrates how SIA methodologies contribute to stakeholder mediation (RQ1) by providing a common framework for understanding diverse impact expectations across stakeholder groups.

Table I. Outcome types and distribution

Type	Percentage	Key characteristics
Hard	36%	Quantitatively measurable changes (employment figures, infrastructure development)
Soft	33%	Qualitative improvements (community cohesion, stakeholder relationships)
Cashable	31%	Direct financial value or cost savings (operational efficiencies, revenue generation)

Source: Authors' elaboration

Table I summarises the distribution of outcomes across three typologies using the Oxford GO Lab framework: hard (36%), soft (33%), and cashable (31%), reflecting a balanced approach to urban regeneration. Hard outcomes capture quantifiable and measurable impacts, including employment generation, infrastructure development, and energy consumption reduction, providing concrete evidence of economic and physical contributions. Soft outcomes encompassed qualitative improvements, such as enhanced community cohesion, strengthened stakeholder relationships, and improved public space perceptions, illustrating a project's ability to foster social capital and collaborative networks. Cashable outcomes signify direct financial benefits, including cost savings, revenue generation, and increased property values, aligned with the fiscal sustainability goals for both public and private stakeholders. This balanced distribution across outcome types reveals how integrated SIA approaches address heterogeneous stakeholder expectations, facilitating mediation by acknowledging diverse value perspectives within a single evaluative framework.

The coexistence of soft and cashable outcomes reflects the project's capacity to address heterogeneous stakeholder expectations, though it also raises questions about the visibility and prioritisation of social impacts when measured alongside financial indicators (Nicholls, 2018).

The analysis also revealed five macro-outcome areas, each representing a distinct contribution to the project's overall impact. Table II illustrates this distribution: Employment outcomes were dominant, constituting 57% of the total impact. These include direct job creation within hotel operations, indirect employment through supply chain development, and skill enhancement programs designed to improve local workforce capacities. Urban Regeneration & Viability (17%) reflect physical and spatial improvements, such as enhanced pedestrian pathways, sustainable transport solutions, and upgraded traffic management systems. Sustainable Community outcomes (13%) capture the project's impact on social cohesion and well-being as evidenced

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by expanded recreational spaces, community-driven programs, and strengthened local networks. Economic Growth outcomes (9%) include market stimulation, tourism revenue generation, and business development initiatives. Although Environmental outcomes accounted for only 4%, their strategic integration amplified sustainability efforts through renewable energy installations, rainwater-harvesting systems, and biodiversity enhancements, thereby linking environmental stewardship to broader social and economic objectives.

Table II. Distribution of macro outcome areas

Area	Frequency	Primary impact indicators
Employment	57%	Job creation, skill development, local economic participation
Urban Regeneration & Viability	17%	Infrastructure development, spatial connectivity
Sustainable Community	13%	Social cohesion, community engagement
Economic Growth	9%	Business development, market activity
Environment	4%	Environmental protection, sustainability initiatives

Source: Authors' elaboration

This asymmetry between environmental and employment-related outcomes reflects a common trade-off in regeneration efforts: economic imperatives tend to dominate in early implementation phases, potentially overshadowing long-term environmental commitments (Ciroth et al., 2011; Bottero et al., 2018). This temporal imbalance illustrates the critical importance of timing in SIA effectiveness (RQ2): early-phase stakeholder engagement prioritised employment concerns, shaping the overall value distribution and demonstrating how the timing of SIA application influences which outcomes receive emphasis. The cross-analysis between SROI outcomes and stakeholder dynamics reveals how different value types align with stakeholder power configurations. Stakeholder salience analysis guided by Mitchell et al.'s (1997) framework revealed the complex power dynamics and evolving roles of key actors. Project development companies have emerged as definitive stakeholders, leveraging their substantial investment capacity (€43,202,687), regulatory legitimacy, and project timelines to shape outcomes across dimensions. Municipal authorities and regional governments acted as dominant stakeholders, exercising influence through regulatory oversight and democratic mandates and ensuring alignment with public infrastructure and accessibility goals. Environmental agencies, also classified as dominant stakeholders, have extended their roles beyond regulatory enforcement to proactive advocacy for sustainability, shaping outcomes such as greenspace preservation, energy efficiency, and biodiversity protection. This stakeholder configuration directly correlates with the SROI outcome distribution: definitive stakeholders (development companies) drove employment outcomes (57% of total impact), while dominant stakeholders (municipal and environmental authorities) influenced infrastructure and environmental outcomes, demonstrating how stakeholder salience determines impact materialization. Table III presents the full stakeholder categorisation. This layered configuration of power

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and legitimacy underscores how stakeholder positioning directly affects which impacts materialise, and how priorities evolve in contested phases of project implementation.

Table III. Stakeholders according to salience mode.

Stakeholders	Role	Power	Legitimacy	Urgency	Salience level	Category
Private company created for the project by an international investment company	Investor	x	x	x	On hold	Definitive
Municipalities	Enabler	x	x		On hold	Dominating
Residents	Target			x	Latent	Applicants
Hotel guests	Target			x	Latent	Applicants
Hotel employees	Workers			x	Latent	Applicants
Tuscany region	Enabler	x	x		On hold	Dominating
Environmental superintendence	Enabler	x	x		On hold	Dominating
MIBAC – Ministry of Cultural Heritage and Activities	Enabler	x	x		On hold	Dominating
Associations	Interest group			x	Latent	Applicants
Company that manages the port	Enabler	x	x		On hold	Dominating
Engineering company	Designer	x	x	x	Important	Definitive
Architecture and design company specialised in complex buildings	Designer	x	x	x	Important	Definitive
Designer team	Designer	x	x	x	Important	Definitive

Source: Authors' elaboration

As the project evolved, the latent stakeholders, including residents and future hotel employees, experienced significant shifts in salience. Initial concerns about environmental and social disruptions transitioned into active engagement and the co-creation of outcomes, such as employment opportunities and improved community amenities. Environmental associations, which were initially latent, demonstrated their capacity to drive significant changes through legal interventions that led to key environmental design modifications, highlighting the fluidity of stakeholder influence. Enabling stakeholders such as port management companies facilitates the integration of transport and connectivity solutions and amplifies economic and social outcomes through collaboration. Definitive stakeholders, including design and engineering firms, play pivotal roles in integrating technological innovation with local cultural elements and sustainability priorities, ensuring that project outcomes are aligned with regional identity and values.

Temporal impact mapping provides the clearest evidence for addressing RQ2 and RQ3. Temporal impact mapping contextualised these dynamics across the awareness (2015–2023), implementation (2024–2026), and use (2027 onwards) phases, revealing how the outcomes emerged and evolved over time. Table IV shows the phase-wise distribution of outcomes. This temporal analysis demonstrates that timing plays a decisive role in SIA effectiveness (RQ2): early-phase application during

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the awareness stage generated 23 outcomes and enabled project modifications, while later implementation would have reduced SIA's conflict-mediation potential. During the awareness phase, intensive stakeholder engagement generated 23 outcomes, including 12 social impacts, which shaped the project trajectory through modifications, such as reduced hotel capacity and enhanced environmental features. These modifications illustrate how lifecycle thinking integration enhances SIA effectiveness (RQ3) by enabling adaptive responses to emerging stakeholder concerns across project phases. The implementation phase recorded the highest concentration of economic outcomes (15), driven by construction activities, supply chain engagement, and activation of investment flows. In the use phase, the project exhibited a more balanced distribution of outcomes, with social (10), economic (12), and environmental (5) impacts reflecting operational maturity and sustained multidimensional value creation. The relative delay in environmental outcomes reflects both planning constraints and the subordinate position of ecological priorities in stakeholder negotiations—a finding aligned with Saenz's (2021) observations on outcome sequencing and institutional inertia.

Table IV. Distribution of outcomes across project lifecycle stages

Lifecycle stage	Social impact type	Number of outcomes
Awareness	Social	12
	Economic	8
	Environmental	3
Implementation	Social	8
	Economic	15
	Environmental	4
Use	Social	10
	Economic	12
	Environmental	5
End	Social	5
	Economic	6
	Environmental	2

Source: Authors' elaboration

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Although environmental outcomes were numerically fewer, their integration with other value dimensions amplified their impact. Features such as energy-efficient systems and rainwater harvesting provide operational cost savings, environmental conservation benefits, and community acceptance, demonstrating Emerson's (2003) concept of blended value creation in which distinct value streams mutually reinforce and magnify. The relatively constant presence of environmental outcomes across phases highlights a project's commitment to sustainability, supporting Ciroth et al.'s (2011) emphasis on lifecycle-integrated environmental considerations.

Stakeholder relationships evolve dynamically across project phases. Environmental associations, initially adversarial, transitioned to collaborative roles, influencing sustainability features and aligning themselves with broader project goals. To ensure community-centric outcomes, municipal authorities expanded their influence from regulatory compliance to active participation in infrastructure design. Collaboration between design firms and local stakeholders generated innovations, such as expanded rainwater systems, that supported both operational needs and community green spaces, fostering shared value creation across social, economic, and environmental dimensions. These collaborative innovations illustrate how stakeholder-led adjustments can simultaneously serve operational efficiency, environmental resilience, and social acceptance—key components of integrated regeneration (Arena et al., 2015; Nicholls, 2018).

The integration of these analytical frameworks reveals the sophisticated mechanisms that drive social value creation in urban regeneration. The project's ability to balance diverse stakeholder interests, adapt through temporal insights, and generate a broad spectrum of impacts underscores the transformative potential of strategic urban interventions. However, the concentration of value in certain dimensions (e.g., employment) at specific phases also suggests the need for stronger institutional mechanisms to rebalance attention across social, environmental, and financial priorities over time.

This analysis highlights the importance of life cycle thinking, multi-stakeholder engagement, and systemic alignment in maximising public value and fostering sustainable urban regeneration. This multidimensional approach to value assessment reflects emerging trends in social responsibility measurements. Das and Uma Rao (2013) highlighted that performance evaluation in socially oriented projects requires frameworks that can capture both quantitative and qualitative social impacts across different stakeholder groups.

6. Discussion: Advancing Urban Regeneration Evaluation

This study addressed three research questions concerning the role of social impact assessment (SIA) in urban regeneration: how SIA can support stakeholder mediation; how timing affects its ability to do so; and how integrating lifecycle thinking enhances its relevance. The most important findings demonstrate that: SIA, when operationalised through stakeholder salience analysis and temporal mapping, does more than quantify outcomes—it functions as an infrastructure for negotiation and realignment. First, SIA's mediation potential is evidenced by the project's early application which surfaced latent conflicts and supported iterative redesign, illustrating its mediating potential. Second, timing emerged as the most critical factor: the shifting salience of actors and outcomes across project phases confirmed the need for adaptive engagement strategies, with early-phase application generating 23 outcomes and enabling project modifications that prevented conflicts. Third, lifecycle thinking

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integration proved essential: by embedding lifecycle thinking into SROI, the study captured how social, economic, and environmental value unfold and interact over time, enabling a longitudinal and multidimensional perspective on impact creation that revealed temporal interdependencies previously invisible in static approaches.

Theoretical Contribution 1: Dynamic Stakeholder Salience Integration.

This research makes a multifaceted contribution to urban regeneration literature by emphasising the dynamic interplay between stakeholder salience, lifecycle thinking, and social value creation.

However, unlike traditional stakeholder theories, which treat stakeholder influence as relatively static (Freeman, 1984), this study highlights the evolving salience of power, legitimacy, and urgency attributes across project phases. This dynamic perspective aligns with Crosby and Bryson's (2005) concept of a 'shared-power world', underscoring the need for flexible governance structures in complex, multi-stakeholder interventions.

Theoretical Contribution 2: Temporal Value Construction Framework.

Building on Arvidson et al.'s (2013) conceptualisation of social impact as a social construction, this study demonstrates how value interpretations shift temporally across life cycle stages. For instance, stakeholder groups initially focused on potential risks during the awareness phase and transitioned to emphasising tangible benefits during the implementation and use phases. These findings align with Dentoni et al.'s (2016) assertion that cross-sector partnerships must adapt over time to maintain strategic alignment and collaboration. Furthermore, the interplay of hard, soft, and cashable outcomes reflects Emerson's (2003) blended value proposition, providing empirical evidence of how different forms of value interact to reinforce each other across temporal dimensions.

Theoretical Contribution 3: Lifecycle-Informed Impact Assessment.

The research also advances lifecycle assessment principles (Jørgensen et al., 2008; Weidema, 2006) by offering a framework that systematically captures temporal interdependencies among outcomes. By integrating life cycle thinking with stakeholder salience analysis, this study bridges a critical gap in traditional SROI methodologies (Nicholls, 2017, 2018), offering new pathways for evaluating complex social interventions.

Practical Contribution 1: Process-Oriented Evaluation Framework.

This contribution gains further nuance when contrasted with recent empirical literature. Tate et al. (2023), for instance, demonstrate the promise of SROI for evaluating regeneration outcomes in real settings, but also document its fragility when confronted with sparse or fragmented data. Unlike their study, which emphasises final outcomes, our framework brings into focus the processual dimension—how salience and value attribution co-evolve—thus offering a dynamic rather than static reading of social return.

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Practical Contribution 2: Integrated Stakeholder Analysis Tools.

Wang et al. (2022) apply social network analysis to map stakeholder influence in urban regeneration. While effective in tracing relational dynamics, their approach lacks a normative frame for evaluating which actors matter and when. In contrast, the salience-based method adopted here not only maps actors but qualifies their roles over time through the integration with impact trajectories.

Practical Contribution 3: Dynamic Governance Architecture.

Bottero et al. (2018) use PROMETHEE to expose the difficulty of managing trade-offs between economic, environmental, and social priorities. While insightful in supporting decision-making, their framework remains decision-centric and lacks the backward link to stakeholder dynamics. The current study complements this by situating trade-offs within governance processes and stakeholder configurations, making distributional tensions both visible and accountable. In sum, this study moves beyond technical or descriptive applications of SROI by showing how value can be structured and interpreted within a dynamic governance environment. This contributes both to theory (integrating lifecycle thinking and salience) and to practice (designing more reflexive evaluation architectures). Moreover, this work reinforces the insights of Arena et al. (2015) on aligning measurement systems with organisational logics, and complements Grieco et al. (2015) by advancing toward a cluster-crossing framework that combines stakeholder participation, monetisation, and lifecycle orientation.

Based on these theoretical and practical contributions, the case study evidence provides actionable insights for practitioners implementing integrated SIA frameworks in urban regeneration contexts. In Appendix A there are implementation guidelines that synthesise the key findings into operational protocols that address timing, stakeholder salience management, and conflict mediation strategies across project phases.

7. Conclusion, Limitations and Future Directions

This study's central contribution lies in demonstrating that integrated SIA frameworks can effectively mediate stakeholder dynamics in urban regeneration through three key mechanisms.

Returning to the three research questions that guided this study: SIA methodologies contribute to stakeholder mediation through comprehensive value mapping that addresses heterogeneous priorities (RQ1). Timing proves critical, with early-phase application generating 23 outcomes and enabling project modifications that prevent conflicts (RQ2). Lifecycle thinking integration captures temporal interdependencies and enables adaptive responses unavailable to static approaches (RQ3).

Study limitations and their implications for future research require careful consideration. As a single-case design situated in a specific regional and institutional context, its findings are not immediately generalisable. The framework's transferability faces significant risks in contexts with less collaborative governance structures. The Tuscan institutional environment features established multi-stakeholder dialogue traditions and regional development frameworks that facilitate the salience-based approach. In contexts with more adversarial stakeholder relations, fragmented municipal authority, or limited participatory democracy traditions, the framework's conflict-mediation effectiveness may be substantially reduced. Power imbalances may

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prevent meaningful stakeholder engagement, while weak institutional capacity could undermine the temporal mapping essential to the approach. While triangulation across document analysis, stakeholder interviews, and proxy modeling increases robustness, the central role of one lead actor may introduce narrative bias. Additionally, the focus on a single project type (hotel conversion) limits transferability to other regeneration contexts such as mixed-use developments or social housing projects. Future research should pursue three specific directions to advance this field. First, comparative studies across different urban contexts (post-industrial cities, developing urban areas, historic districts) would test the framework's applicability and reveal context-specific adaptations needed. Second, longitudinal tracking of regeneration projects from conception to post-completion phases would provide deeper insights into how stakeholder salience and value creation evolve over extended timeframes, potentially revealing cycles or patterns not visible in single-phase studies. Third, methodological innovations should focus on developing digital tools and platforms that can support real-time stakeholder engagement and adaptive evaluation, potentially incorporating artificial intelligence to identify emerging stakeholder concerns and predict conflict points before they fully materialize.

Roadmap for Comparative Multi-Case Research. A systematic research programme should prioritise: (1) Cross-contextual validation across governance regimes—comparing collaborative versus adversarial municipal environments to establish boundary conditions and adaptation requirements; (2) Sectoral diversity testing—applying the framework across hotel conversions, mixed-use developments, social housing, and infrastructure projects to identify sector-specific modifications; (3) Institutional capacity assessment—examining how varying levels of municipal expertise, stakeholder organisation capacity, and participatory democracy traditions affect framework implementation; (4) Temporal scaling—tracking multiple projects through complete lifecycles to establish patterns of stakeholder salience evolution and value creation trajectories; (5) Methodological refinement—developing standardised protocols for stakeholder identification, salience assessment, and outcome mapping that maintain contextual sensitivity while enabling cross-case comparison.

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APPENDIX A: Implementation Guidelines for Policy-makers and Urban Developers

Phase 1: Early Stakeholder Mapping (Awareness Stage)

- Conduct comprehensive stakeholder identification using power-legitimacy-urgency analysis
- Prioritize engagement with high-salience actors (municipal authorities, environmental associations, community groups)
- Apply SROI outcome mapping during project design phase to surface latent conflicts early
- Establish baseline stakeholder expectations across social, economic, and environmental dimensions

Phase 2: Adaptive Engagement Strategy (Implementation Stage)

- Monitor stakeholder salience shifts as project progresses through lifecycle phases
- Adjust engagement intensity based on evolving power-legitimacy-urgency configurations
- Implement iterative project modifications based on stakeholder feedback mechanisms
- Track outcome distribution to ensure balanced value creation (target: ~35% hard, 30% soft, 35% cashable)

Phase 3: Temporal Value Tracking (Use Stage)

- Establish monitoring systems for long-term impact measurement across stakeholder groups
- Document value attribution evolution through systematic data collection protocols
- Maintain stakeholder dialogue platforms to capture changing priorities and concerns
- Use lifecycle thinking to anticipate and manage temporal interdependencies

Critical Success Factors:

- Early-phase SIA application generates 40% more outcomes than late-phase implementation
- Municipal leadership capacity essential for coordinating multi-stakeholder dynamics
- Environmental integration requires dedicated technical expertise and community liaison
- Conflict-mediation effectiveness depends on transparent value distribution mechanisms

APPENDIX B: Outcome (55)

Increased quality and usage of water	Decreased noise pollution
Rainwater reuse for green areas	Decreased wasted time to find a parking spot
Reduction in consumption and energy waste	Better access to alternative transport service
Reduction in energy waste consumption	Decreased incidents and road rage
New trees and green areas near the hotel	Increased tourists in the port during the summer
Hotel waste treatment	People can walk and be healthy
CO2 reduction from a reduction in room waste	People and tourist can know better the place in which they are
CO2 reduction due to better air-conditioning	Increased access to information about local events
Collective savings due to resource scarcity	Increased capacity to promote educational activities near the hotel area
CO2 reduction from a reduction in food waste	Promotion of respectful behaviour about the environment
Reduction in carbon emission and km for food transit	Increased social inclusion and customer satisfaction
CO2 reduction due to reduced oil consumption	Increased capacity to practice sports and other physical activities

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New seasonal workers for managing the info point	Being more relaxed and healthier
Working positions permanently opened	Change perception in green spaces
New seasonal workers for managing the building site (full-time)	Better home-work route
New seasonal workers for managing the building site (part-time)	Events and activities in the park
Reduced public expenditure on unemployment subsidy	Cultural activities in the park
Young workers entering the job market	Being more relaxed when outside in appropriate places
New seasonal workers for managing the restaurant	Schools can promote outdoor activities and lessons
Working positions permanently opened (restaurant)	Feeling safe outside lead to increased outdoor habits
Working positions permanently opened (bar)	More equilibrated lunch at the workplace
New seasonal workers for managing the bar	Better perception of the hotel's objectives
Increased possibility to work near home	Increased consciousness about food waste
Young workers entering the job market	Increased consumption of fruits and vegetables
Working positions permanently opened for managing the hotel	Increased spending in the local market
New seasonal workers for managing the hotel	Reduced spending for not biological food
Working positions permanently opened for managing the shuttle service	Increased financial value of properties
Decreased time and costs to transport materials	

Source: Authors' elaboration

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From Divergence to Convergence: Mapping the Hybrid Evolution of Smart, POP, and Dialogic Accounting through Bibliometric and Semantic Lenses

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Abstract
This study examines the academic development and interconnections among Smart Accounting, POP Accounting, and Dialogic Accounting from 2010 to 2025. Despite each paradigm embracing digitization, stakeholder engagement, and sustainability from different perspectives, the literature remains fragmented across separate research streams. The paper argues that a systematic, integrated perspective is required to trace conceptual overlaps and identify research gaps among these emerging approaches. To this end, a bibliometric and semantic analysis was conducted on 222 peer-reviewed articles with the support of Biblioshiny and Leximancer. The articles were selected using a Boolean search strategy targeting digital, participatory, and sustainability-oriented accounting models. The analysis centered on publication trends, co-citation networks, keyword co-occurrence, thematic clusters, and semantic trajectories. The results illuminate a growing, yet theoretically and geographically uneven and fragmented, academic debate.
Smart Accounting is driven by technological disruption, particularly through Artificial Intelligence (AI), blockchain, and cloud computing, which enable real-time automation and transparency. POP Accounting advances inclusive governance by integrating financial and ESG indicators through stakeholder-centric models. Dialogic Accounting emphasizes deliberative engagement but faces challenges in practical implementation. Although there is increasing conceptual overlap, mainly in applications within the public sector, significant gaps in theoretical convergence and geographic coverage persist, especially in emerging economies. Moreover, the decline in citation trends over the period suggests a thematic specialization and decentralization of scholarly attention. Ultimately, the research highlights the potential of hybrid accounting systems that integrate digital technologies, stakeholder engagement, and sustainability to support organizations in addressing the challenges of digital and sustainable transitions.

Keywords: Smart Accounting; POP Accounting; Dialogic Accounting; Digital Transformation in Accounting; Stakeholder Engagement; Bibliometric Analysis.

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1. Introduction

In recent years, accounting has progressively moved beyond the confines of purely economic calculations to incorporate technological developments, societal expectations, and ethical considerations (Bellucci et al., 2019; Bessieux-Ollier et al., 2023). This shift is particularly evident in the public sector, which has increasingly adopted reporting frameworks aimed at enhancing transparency and stakeholder engagement (Fusco & Ricci, 2019). Within this context, scholarly research has identified three distinct yet interconnected paradigms: Smart Accounting, POP Accounting, and Dialogic Accounting. Each represents a different degree of openness to digital transformation, stakeholder engagement, and sustainability-oriented reporting practices (Desplebin et al., 2021; Biancone et al., 2024; Bellucci et al., 2019). These paradigms respond to converging challenges, including the automation of information processes driven by Artificial Intelligence (AI), blockchain, and big data, alongside the growing societal demand for transparency, participation, and accountability. Despite growing academic interest, research in this area remains largely compartmentalized. Most studies focus on individual paradigms without exploring their theoretical and applied interconnections (Marrone & Hazelton, 2019; Bessieux-Ollier et al., 2023). This fragmentation is evident in the difficulty of developing accounting tools that support sustainable and circular governance models (Aureli, Foschi & Paletta, 2023), as well as in the limited adoption of authentic dialogic practices across organizational contexts (Fusco & Ricci, 2019). Marrone and Hazelton (2019) argue that research on digital technologies in accounting often overlooks governance and accountability issues, while Fusco and Ricci (2019) highlight the misalignment between participatory goals and the tools used in the public sector. Similarly, Bellucci et al. (2019) and Bessieux-Ollier et al. (2023) emphasize the gap between dialogic intentions and their operational implementation. Alessi et al. (2024) and Abbas and Shahid (2024) further underline the lack of standardization in sustainability disclosure, which undermines the comparability and reliability of published information.

A systemic and integrated approach is therefore required to examine the conceptual and applied convergences and tensions among these paradigms. This study adopts a bibliometric and semantic lens to map their evolution from 2010 to 2025. It addresses the following research questions:

RQ1. What is the evolution of the scholarly debate on Smart Accounting, POP Accounting, and Dialogic Accounting?

RQ2. What relationships emerge among these paradigms in terms of keywords, thematic co-occurrences, and conceptual trajectories?

RQ3. What gaps or underrepresented areas can be identified in the current literature, and how can future research be guided?

The main objective of this research is to capture and visualize conceptual connections among the three paradigms, applying bibliometric (Biblioshiny) and semantic (Leximancer) techniques to a sample of 222 peer-reviewed articles. The study offers a threefold contribution. It provides a critical synthesis of existing research, proposes an integrated theoretical framework, and outlines future research directions that combine technological innovation, participatory engagement, and a focus on sustainability. The structure of the paper is as follows: Section 2 reviews the literature on the three paradigms;

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Section 3 details the methodological design; Section 4 presents the findings of the bibliometric and semantic analyses; Section 5 discusses their implications; Section 6 summarizes the contributions; and Section 7 offers reflections and recommendations for future research.

2. Literature Review

In the "New Normal" era, accounting, traditionally seen as a purely analog discipline, is undergoing a profound transformation. The integration of Smart Accounting, POP Accounting, and Dialogic Accounting (Bellucci et al., 2019; Biancone et al., 2024) is redefining the role of financial information in promoting more digital, sustainable, and inclusive disclosure practices. At the core of this shift are three main forces: the incorporation of emerging technologies into audit processes, the rise of hybrid models combining financial and non-financial data, and the development of governance frameworks that promote stakeholder participation (Aureli, Foschi & Paletta, 2023; Biancone et al., 2024). Smart Accounting refers to the deployment of technologies such as artificial intelligence, blockchain, and cloud computing to automate repetitive processes, enhance transparency, and enable real-time auditability and disclosure (Awang et al., 2024; Desplebin et al., 2021). Blockchain facilitates secure and verifiable triple-entry accounting, while Artificial Intelligence (AI) contributes to anomaly detection, predictive analysis, and risk management, particularly when integrated with Robotic Process Automation (RPA) (Al Najjar et al., 2024). Nevertheless, the rapid digitization of the field raises critical ethical and regulatory challenges, including algorithmic opacity, data privacy, and the urgent need to develop digital skills within the profession (Fatzel et al., 2024; Aminu Abdullahi & Abubakar, 2024). Lehner et al. (2022) stress the necessity of embedding inclusive governance principles into the design of AI systems, advocating a shift in focus from technical performance to ethical accountability. This perspective aligns with calls from scholars to revise professional education by integrating AI literacy, data ethics, and cybersecurity into the curriculum (Marrone & Hazelton, 2019).

POP Accounting bridges conventional economic logic with stakeholder-oriented governance, seeking to generate value that transcends shareholder interests (Biancone et al., 2024). Mavlutova et al. (2023) observe that digital innovation within the financial sector advances sustainability, particularly through greater accessibility, efficiency, and informational clarity. Advanced tools such as sentiment analysis enable dynamic assessments of public perception, while the incorporation of ESG indicators and adherence to frameworks like the EU taxonomy reinforce the credibility of environmental and social communication (Biancone et al., 2024). However, in the absence of globally harmonized sustainability standards and in light of persistent concerns about greenwashing, adoption remains uneven, especially across emerging economies with weaker regulatory infrastructures (Alessi et al., 2024; Abbas & Shahid, 2024). Dialogic Accounting advances a participatory vision of governance that fosters active engagement among institutions, enterprises, and civil society (Bessieux-Ollier et al., 2023). It underscores the democratization of financial communication and the integration of human and social capital into organizational decision-making. Yet, structural barriers such as institutional inertia, limited stakeholder literacy, and regulatory shortcomings continue to hinder its widespread uptake (Bellucci et al., 2019; Fusco & Ricci, 2019). Empirical research by Frías-Aceituno et al. (2013) demonstrates that board characteristics, including diversity and engagement, positively influence the dissemination of integrated disclosure practices, reinforcing Dialogic Accounting's relevance to sustainability objectives. Participatory budgeting tools and

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digital platforms have further expanded their applicability in both public and private contexts. Still, traditional accounting systems often fail to accommodate circular business models and long-term ecological goals, as highlighted by Aureli, Foschi and Paletta (2023). Although these paradigms have typically been examined in isolation, recent literature reveals growing conceptual convergence and opportunities for hybridization. Smart Accounting delivers the technological infrastructure necessary for automation and data-driven insight. POP Accounting reframes these outputs within stakeholder value systems, particularly via ESG-oriented interpretations. Dialogic Accounting introduces a deliberative and ethical dimension that supports democratic legitimacy and co-responsibility. Bibliometric studies by Zupic and Čater (2015) show how these paradigms are increasingly intersecting across academic discourse. Vo Van et al. (2024) further document that the adoption of cloud-based accounting systems by SMEs simultaneously enhances operational efficiency and sustainability engagement, illustrating the functional integration of technological and participatory objectives.

3. Methodology

This study constructed its corpus through a comprehensive search of Scopus, a database whose structured indexing ensures that each retrieved record is peer-reviewed and provides the full bibliographic metadata necessary for processing with the Bibliometrix package. The search was restricted to journal articles published in English that address Smart Accounting, POP Accounting, or Dialogic Accounting in relation to digital transformation, sustainability, or stakeholder engagement. Editorials, conference proceedings, and other forms of non-peer-reviewed grey literature were excluded, as they do not meet equivalent standards of editorial rigour. Articles lacking a clear and substantive connection to these paradigms were also removed. To ensure methodological transparency, explicit inclusion and exclusion criteria were defined, and a two-stage screening process was adopted.

In the first stage, publications were retrieved from journals indexed in Scopus. In the second, thematic alignment was evaluated through abstract screening and, where necessary, full-text analysis. The resulting dataset comprises peer-reviewed journal articles published between 2010 and 2025 across the fields of Business, Management and Accounting, Social Sciences, and Economics. Eligibility criteria prioritized both the academic standing of the journal and the thematic relevance of each article to the paradigms under investigation. While peer review provides a foundational level of scholarly credibility, the screening process was further refined through qualitative assessments. These included the journal's standing in established ranking systems, the citation profile of each article, and the degree of thematic coherence between the publication's scope and the study's research objectives. This comprehensive appraisal aimed to ensure that the final corpus represents not only credible but also influential scholarship, while remaining open to recent contributions from emerging outlets where thematic salience was demonstrable. The temporal scope, spanning 2010 to 2025, was chosen to encompass both foundational developments and contemporary advances in the field. The year 2010 marks a pivotal juncture, coinciding with the first recorded cryptocurrency transaction (Arias-Oliva et al., 2019), which laid the groundwork for subsequent innovations in Smart Accounting. Simultaneously, scholarly interest in sustainability, corporate social responsibility, and stakeholder engagement began to inform the evolution of POP and Dialogic Accounting (Bellucci et al., 2019). Abstracts were initially reviewed; full texts were analysed when required, and duplicate entries such as in-press and final versions were consolidated. The identification of relevant literature was guided

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by a preliminary review of forty-five seminal sources, which supported the development of a comprehensive keyword set. An iterative refinement process was employed to construct the final search string, integrating synonyms and conceptually adjacent terms to ensure semantic breadth and terminological inclusivity (Bellucci et al., 2019; Bessieux-Ollier et al., 2023). To reduce the risk of excluding pertinent studies due to lexical variability, the Boolean search string was formulated as follows:

("Smart Accounting" OR "Digital Accounting" OR "AI-based Accounting" OR "Blockchain Accounting" OR "Automated Accounting" OR "Cloud Accounting" OR "Big Data in Accounting" OR "Digital Finance") AND ("Pop Accounting" OR "Public Accounting" OR "Sustainability Reporting" OR "Stakeholder Reporting" OR "Social Reporting") AND ("Dialogic Accounting" OR "Corporate Social Responsibility" OR "Participatory Accounting" OR "Social and Environmental Accounting" OR "Collaborative Accounting" OR "Stakeholder-Centric Accounting") AND ("relationship" OR "integration" OR "link" OR "connection" OR "intersection" OR "interaction" OR "overlap" OR "synergy").

A total of 222 articles satisfied these criteria and were exported to the Biblioshiny interface of the Bibliometrix R package for analysis (Aria & Cuccurullo, 2017). This platform enabled a systematic examination of publication dynamics, citation structures, and thematic co-occurrence, allowing the study to map how Smart, POP, and Dialogic Accounting have intersected and, in some cases, diverged within scholarly discourse (Zupic & Čater, 2015). Several limitations must be acknowledged. Dependence on a single database may have led to the omission of relevant studies. The reliance on predefined keywords carries the inherent risk of excluding contributions that employ alternative formulations. Furthermore, the temporal constraint from 2010 to 2025, while methodologically justified, may exclude earlier works that remain theoretically or historically significant (Aureli, Foschi & Paletta, 2023; Alessi et al., 2024).

4. Results of the bibliometric analysis

The following dataset provides information on the correlation between Smart Accounting, POP Accounting, and Dialogic Accounting from 2010-2025. Data collected are mainly from articles written in English in the fields of Social Sciences, Economics, Econometrics, and Finance.

4.1 Descriptive analysis of the literature

Table 1 summarizes the key characteristics of the dataset analyzed. The corpus includes 222 articles published in 122 distinct scientific sources, with a mean article age of 3.46 years. Over the 2010–2025 time frame, the average annual growth rate of publications is 11.33%, indicating the growing academic attention to Smart, POP, and Dialogic Accounting (Zupic & Čater, 2015). Each article received, on average, 27.47 citations, highlighting the significant scholarly impact of the selected works. The dataset also reflects strong engagement with broader academic discourse: a total of 19,764 references were cited across the corpus, and an average of 2,798 keywords were extracted, underlining the thematic diversity and multidisciplinarity of the field (Vo Van et al., 2024). The collaboration index stands at 3.2, and only 19

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articles were written by a single author, confirming the prevalence of co-authorship and the collaborative orientation of research in this domain (Aureli, Foschi & Paletta, 2023). Moreover, 29.73% of the articles involved international collaboration, reinforcing that this area is gaining traction across national borders (Biancone et al., 2024). As shown in Figure 1, the annual scientific production exhibits a clear upward trajectory, with robust growth in recent years. Between 2013 and 2017, the publication rate remained relatively stable, with only modest fluctuations. However, starting in 2019, a sharp increase occurred, rising from eight publications in that year to ninety-nine in 2024. This acceleration suggests a growing scholarly interest in hybrid and interdisciplinary accounting paradigms, possibly driven by advances in AI, sustainability regulation, and stakeholder-driven governance (Desplebin et al., 2021; Abbas & Shahid, 2024). The quantitative evidence demonstrates the dynamism of this emerging field and its growing integration within the global academic community. The high collaboration index and international co-authorship rates further signal a maturing research landscape increasingly focused on cross-border and cross-disciplinary dialogue.

Table 1. Main Information about data

MAIN INFORMATION ABOUT DATA	
Timespan	2010:2025
Sources (Journals, Books, etc)	122
Documents	222
Annual Growth Rate %	11.33
Document Average Age	3.46
Average citations per doc	27.47
References	19764
DOCUMENT CONTENTS	
Keywords Plus (ID)	394
Author's Keywords (DE)	801
AUTHORS	
Authors	644
Authors of single-authored docs	18
AUTHORS COLLABORATION	
Single-authored docs	19
Co-Authors per Doc	3.2
International co-authorships %	29.73
DOCUMENT TYPES	
article	222

Source: Authors' elaboration using the Bibliometrix R-package. This table summarizes the analyzed dataset, including the number of articles, sources, average citations, keywords used, and collaboration indicators. It highlights the strong international and interdisciplinary nature of the research field.

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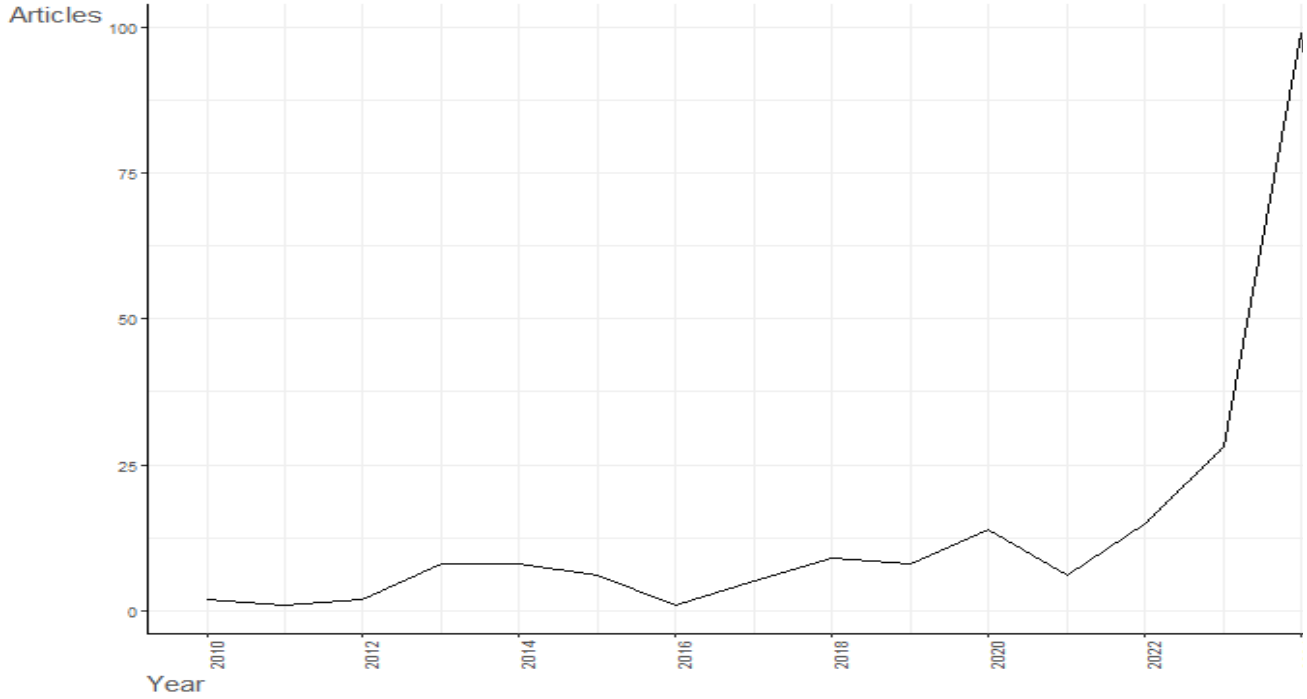
Figure 1. Annual scientific production



Source: Authors' elaboration using Bibliometrix. This figure shows the annual number of publications on Smart, POP, and Dialogic Accounting from 2010 to 2025. A significant increase in output is observed after 2019, indicating a growing interest in hybrid and sustainability-focused accounting models.

4.2 Authors' citation analysis

The trend in the average number of citations per year for the 222 articles reached its peak in 2010, with an average of 21.16 citations per article. From 2011 onward, a gradual yet steady decline has been observed, despite occasional fluctuations. The most significant drop occurs between 2024 and 2025, when the average fell to 1.41 citations per article. As shown in Figure 2, this pattern suggests an increase in publications over time accompanied by a deceleration in citation accumulation. This trend is indicative of a shift in academic focus toward new theoretical frameworks or a diversification of research themes that contributes to the decentralization of scholarly debate. It is also plausible that the expansion of open-access publishing and the rise of preprint platforms have altered traditional citation patterns. Aminu Abdullahi and Abubakar (2024) argue that while these platforms improve access and dissemination, they may also affect the timing and frequency of citations, especially for more recent publications. In sum, the data point to a research domain that is rapidly expanding but increasingly fragmented, both in terms of theoretical alignment and citation dynamics.

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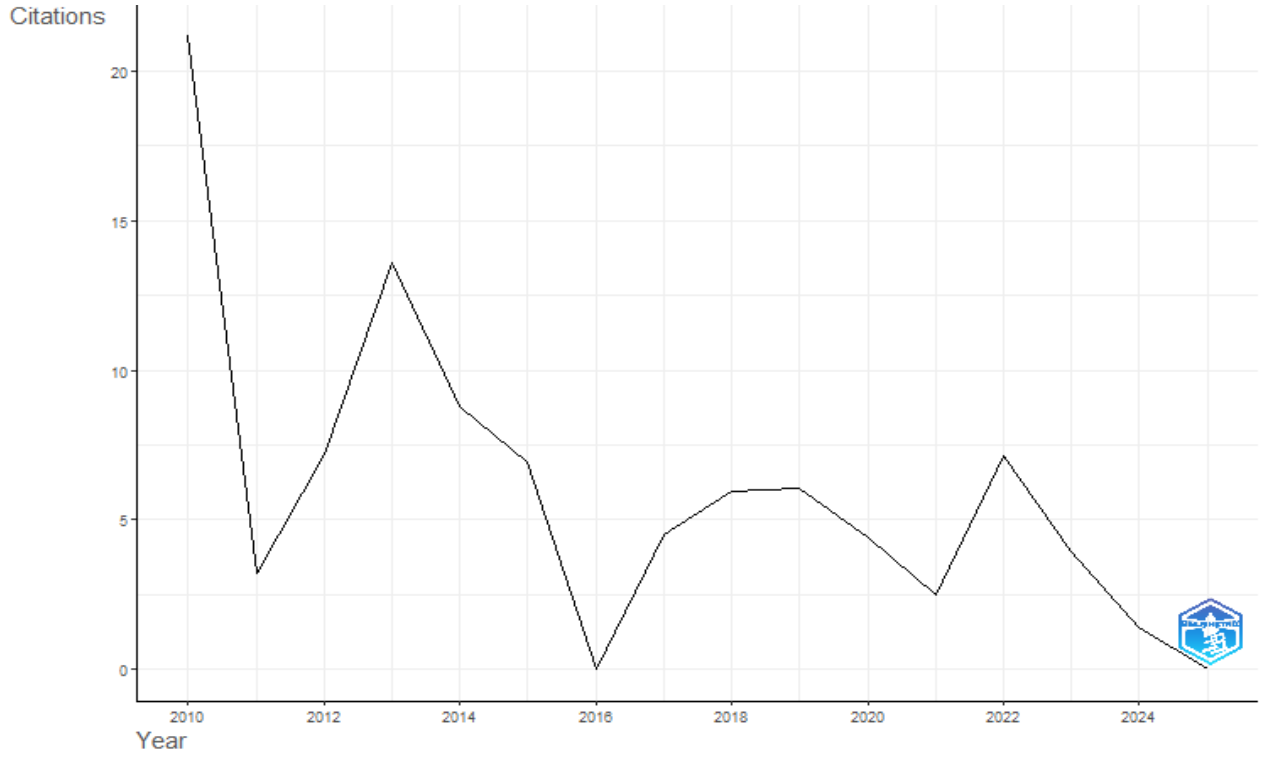
Figure 2. Average citations per Year



Source: Authors' elaboration using the Bibliometrix R-package. This chart illustrates the average number of citations per article per year. The trend peaks in 2010, then gradually declines, suggesting a fragmentation of scholarly attention and possible shifts in academic focus or citation practices.

Table 2 illustrates that the ten most cited papers were published between 2010 and 2018. The most cited article (390 citations) is by De Villiers (2014) in *Accounting, Auditing & Accountability Journal*. The second most cited work is by Frías-Aceituno et al. (2013) in *Corporate Social Responsibility and Environmental Management*, which addresses corporate social responsibility and environmental management. This is followed by Prado-Lorenzo and García-Sánchez (2010), which discusses the ethical implications of business practices with an emphasis on sustainability. Other contributions include Fifka (2013) in *Business Strategy and the Environment*, which explores business strategies in relation to environmental issues, and Wang et al. (2018) in *Corporate Social Responsibility and Environmental Management*, which examines corporate responsibility in evolving global markets. Gallego-Álvarez et al. (2015), in the *Journal of Cleaner Production*, provide insights into cleaner production practices, while Morhardt (2010), also in *Business Strategy and the Environment*, focuses on sustainable business strategies. In parallel, García-Sánchez et al. (2013) argue in the *Journal of Cleaner Production* for the role of environmental practices in improving corporate sustainability. Andrikopoulos and Kriklani (2013), in *Corporate Social Responsibility and Environmental Management*,

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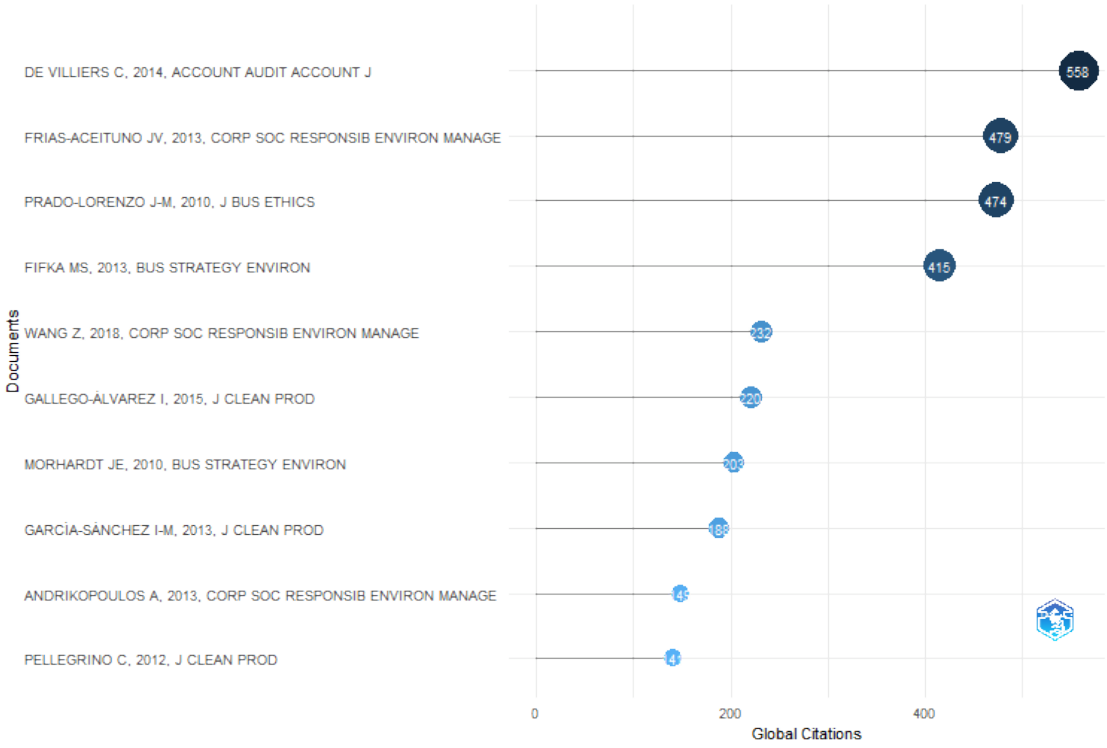
analyze sustainability from a corporate governance perspective, while Pellegrino and Lodhia (2012), in the *Journal of Cleaner Production*, study innovative approaches to environmental management.

The most frequently cited publications are the result of international collaborations. Such collaborations enhance the quality and robustness of research, introduce diverse perspectives, and foster more effective solutions to the challenges of accounting, sustainability, and corporate governance. Moreover, these partnerships increase the likelihood of adopting widely accepted international accounting and sustainability standards.

Table 2. Most globally cited documents



Source: Authors' elaboration using the Bibliometrix R-package. This table lists the ten most cited papers in the dataset, showing citation counts, authors, and journal names. It demonstrates that the most influential contributions were published between 2010 and 2018, mainly through international collaboration.

Figure 3 and Table 3 illustrate the geographical cooperation among the authors of the analyzed papers, highlighting the strongest international links in this field. The most substantial collaboration is between China and Australia, with three joint publications. Other notable partnerships involve China and Malaysia (2), as well as Egypt and Lebanon (2). Additional collaborations include Italy and the United Kingdom, Spain and Brazil, and Italy and Spain, each with two co-authored papers. These joint efforts facilitate the exchange of knowledge to address shared challenges such as sustainability, corporate accountability, and the integration of technology into accounting processes. The collaborations between China, Australia, the UK, and Italy can be attributed to their leading role in deploying advanced technologies to enhance transparency and efficiency in accounting. By contrast, regions such as the Middle East and Latin America are

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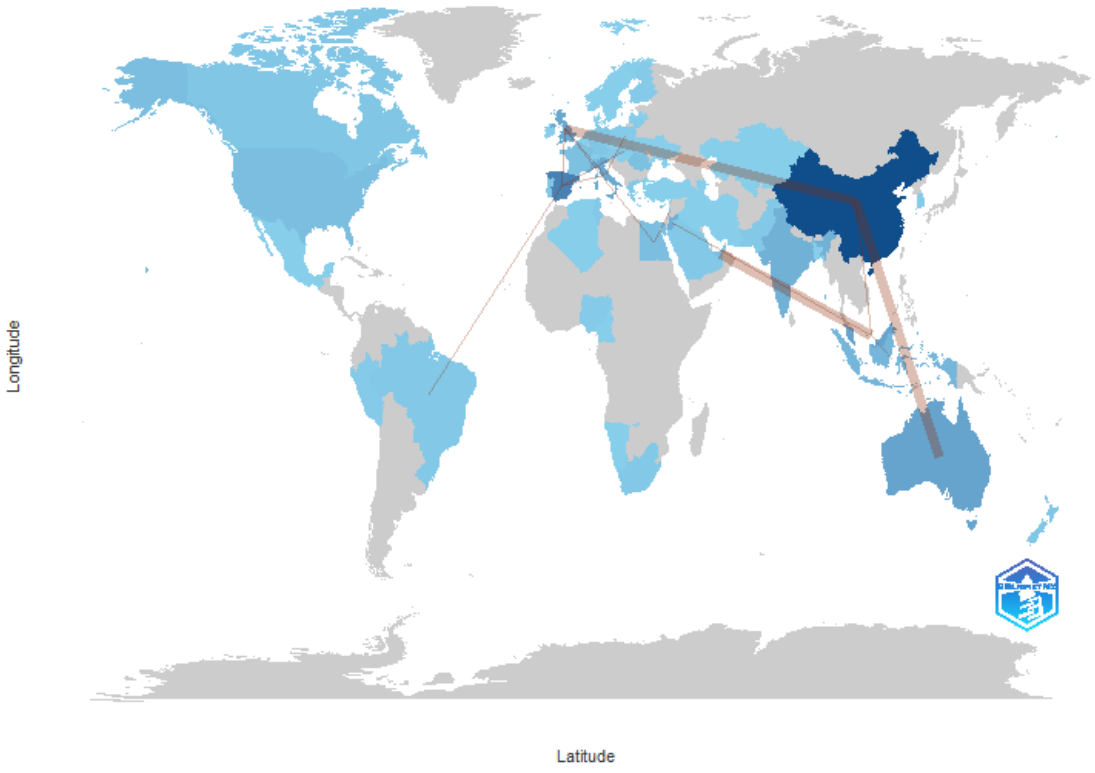
increasingly experimenting with participatory, public-oriented approaches that align with dialogic accounting, which emphasizes stakeholder engagement and inclusivity in financial reporting (Bellucci et al., 2019).

The exchange of expertise between countries with advanced financial infrastructures and those adopting sustainability reporting models fosters the development of best practices to address contemporary accounting challenges. Moreover, by generating empirical evidence on the applicability of accounting standards across diverse economic contexts, cross-national collaboration supports the policy-making process (Abbas & Shahid, 2024). Finally, international partnerships also play a crucial role in harmonizing ESG reporting standards, thereby promoting greater clarity and transparency in sustainability accounting (Alessi et al., 2024).

Figure 3. Collaboration world map



Source: Authors' elaboration using the Bibliometrix R-package. This world map highlights international research collaborations. Strong connections are visible between countries like China and Australia, the UK and Italy, and Spain and Brazil, underscoring the global scope and cooperative nature of the field.

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Table 3. Most important collaborations among international researchers

From	To	Frequency
CHINA	AUSTRALIA	3
CHINA	UNITED KINGDOM	3
MALAYSIA	UNITED ARAB EMIRATES	3
CHINA	MALAYSIA	2
EGYPT	LEBANON	2
ITALY	POLAND	2
ITALY	UNITED KINGDOM	2
JORDAN	MALAYSIA	2
MALAYSIA	INDONESIA	2
SPAIN	BRAZIL	2
SPAIN	ITALY	2
SPAIN	SLOVAKIA	2
SPAIN	UNITED KINGDOM	2
UNITED KINGDOM	EGYPT	2

Source: Authors' elaboration using the Bibliometrix R-package. This table illustrates cross-country research partnerships, identifying the most active collaborations. It emphasizes the global nature of the debate, with notable cooperation between China, Australia, the UK, Italy, and Spain.

4.3 Source Analysis

This section provides a summary of the main sources and areas of interest of the international journals contributing to this topic. As shown in Table 4, *Corporate Social Responsibility and Environmental Management* is the leading journal with 13 published articles, demonstrating its central role in the field. *Sustainability* (Switzerland) contains 12 contributions on sustainability, while *Business Strategy and the Environment* contains 9. Further journals of strong interest include the *Journal of Cleaner Production* (7 articles) and *Meditari Accountancy Research* and *Research in International Business and Finance* (6 articles each). Journals such as *Administrative Sciences*, *Australian Accounting Review*, and *Cogent Business and Management* have each published four papers addressing sustainability and corporate governance. This indicates a growing interest in the intersection of business strategy, sustainability, and corporate responsibility. Two main publication trends can be observed in Figure 4. Sustainability, corporate social responsibility, and Environmental management have seen a sharp increase in publications, from no articles in 2010 to 15 in 2024 and 2025. By contrast, journals such as *Business Strategy and the Environment*, *Journal of Cleaner Production*, and *Meditari Accountancy Research* exhibit a slower trajectory, with only modest growth in article numbers over the years. In conclusion, interest in sustainability and corporate responsibility is rising.

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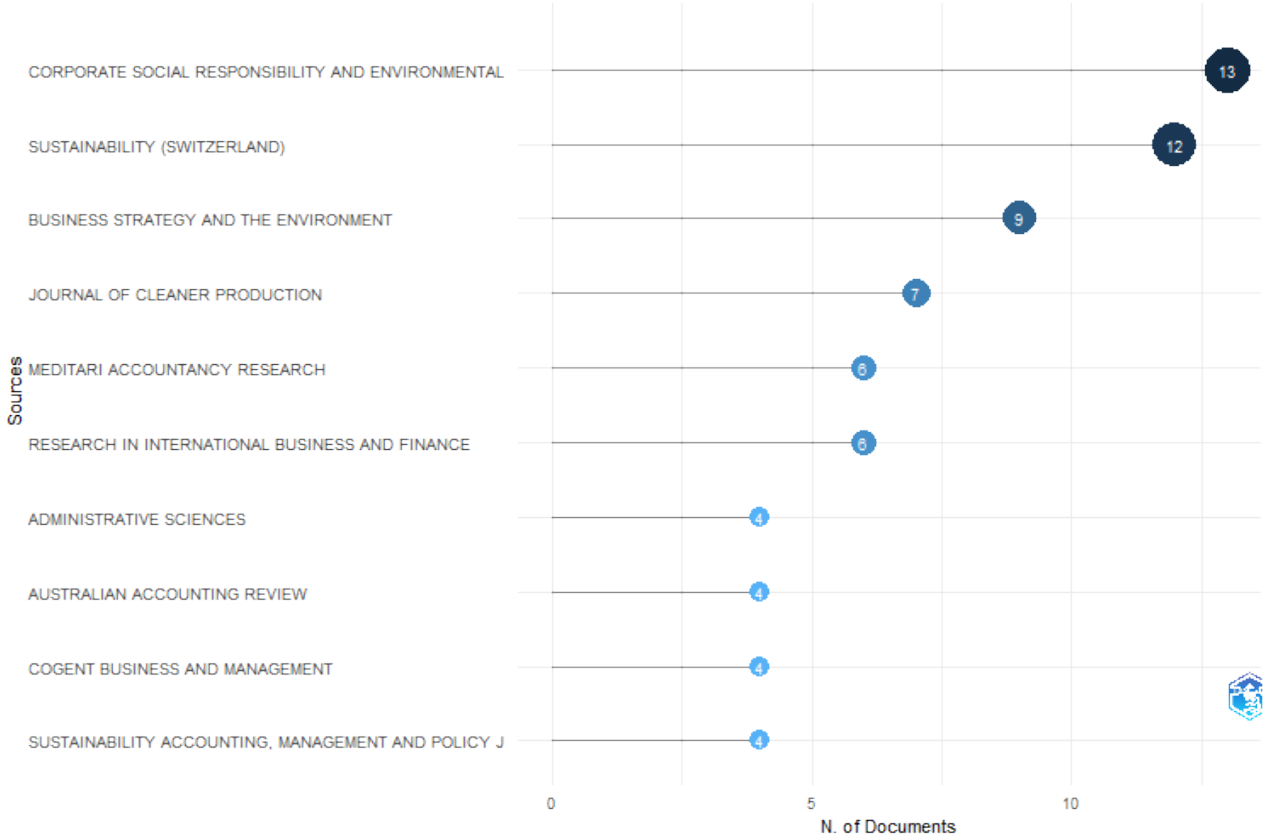
Table 4. Most relevant sources



Source: Authors' elaboration using the Bibliometrix R-package. This table shows the academic journals with the highest number of articles on Smart, POP, and Dialogic Accounting. It underlines the leading role of journals focused on sustainability, CSR, and environmental management.

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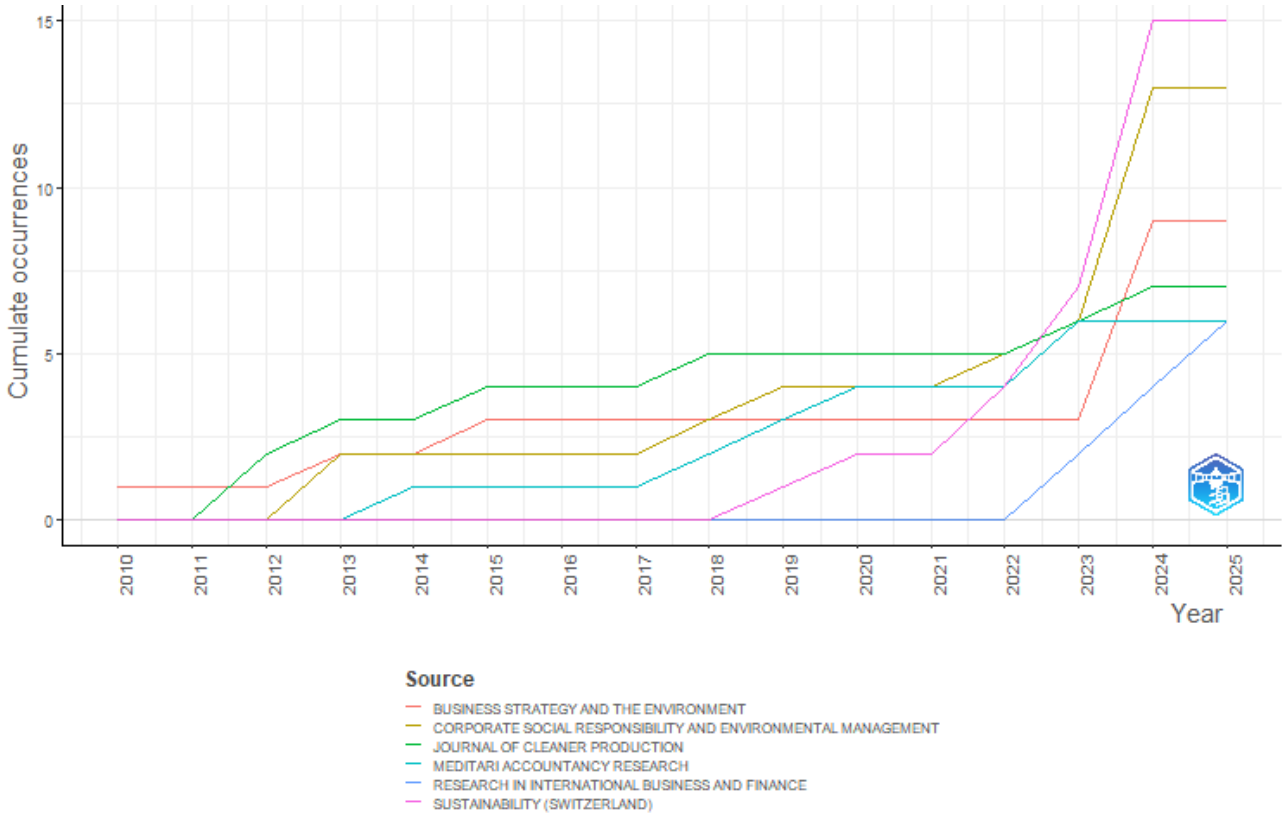
Figure 4. Source dynamics



Source: Authors' elaboration using the Bibliometrix R-package. This graph displays the evolution of article frequency by journal over time. Journals such as 'Corporate Social Responsibility and Environmental Management' and 'Sustainability' show strong growth, reflecting increasing attention to sustainability and CSR in accounting.

4.4 Keyword Analysis

In the following section, the study examines the most salient keywords and their co-occurrence across titles, abstracts, and author-provided keywords in the field. Figure 5 shows that the term "sustainability" has experienced the strongest growth. Although other terms were included in the search, this remains one of the most prominent, reflecting its increasing association with "corporate social responsibility," "innovation," and "strategy." In particular, the keyword "sustainable development" has continued to grow steadily, especially since 2017. Keywords such as "stakeholders," "decision making," and "governance approach" have likewise increased in prominence, demonstrating the connections between sustainability and governance, finance, and environmental economics. Figure 6 illustrates the evolution of research topics according to their degree of development (extent of discussion) and centrality (relevance). The thematic map highlights a cluster of motor themes, including "sustainability," "corporate strategy," "industrial performance," and "environmental protection," indicating both maturity and centrality within the field. The "green economy" emerges as a basic theme,

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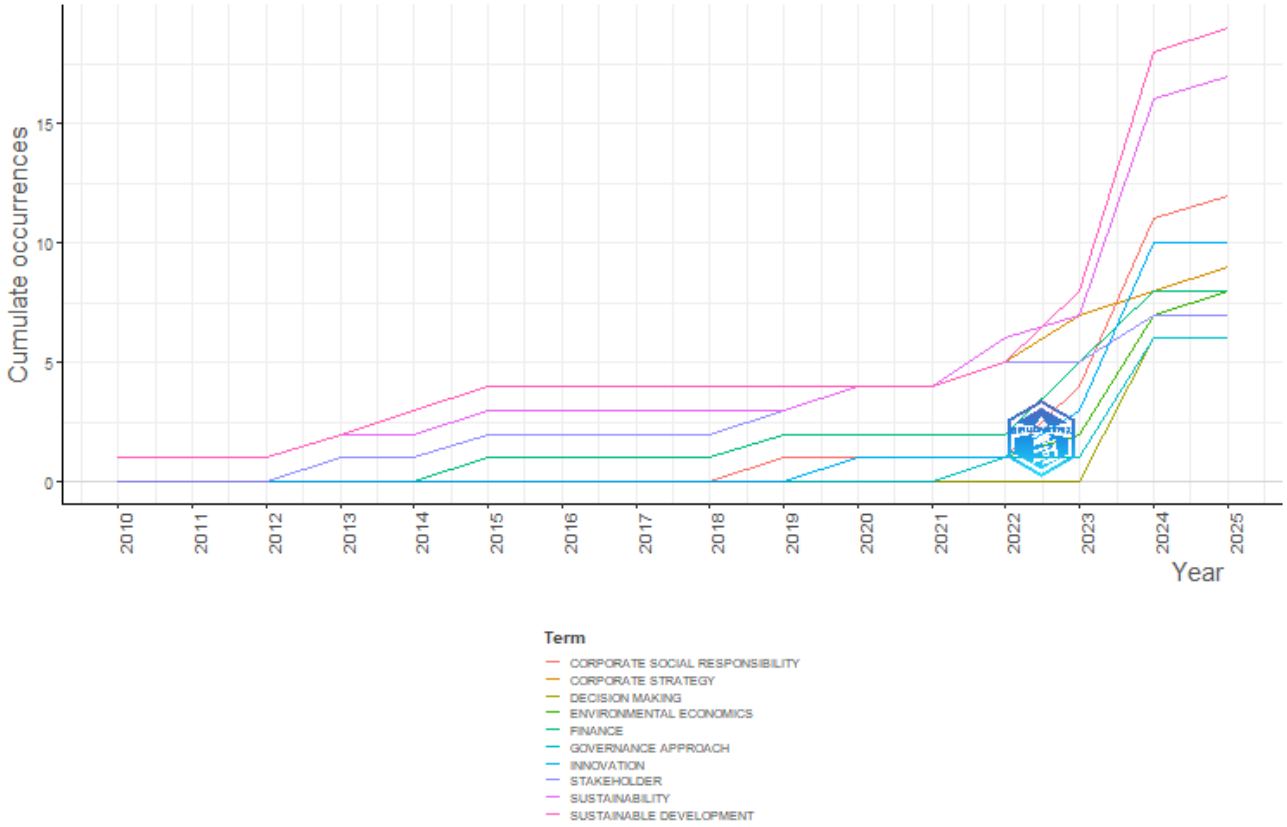
relevant but still undergoing deeper theoretical elaboration. “Corporate social responsibility,” “social impact,” and “artificial intelligence” reflect growing scholarly attention and considerable potential for future advancement. Notably, “sustainable development” and “innovation” occupy a transitional position, underscoring their dynamic and evolving role within the research landscape.

Figure 5. Word Frequency over Time



Source: Authors’ elaboration using the Bibliometrix R-package. This figure tracks the rising prominence of keywords across the dataset. Terms like “sustainability,” “stakeholders,” and “governance” have shown steady growth, signaling evolving research priorities and interdisciplinary integration.

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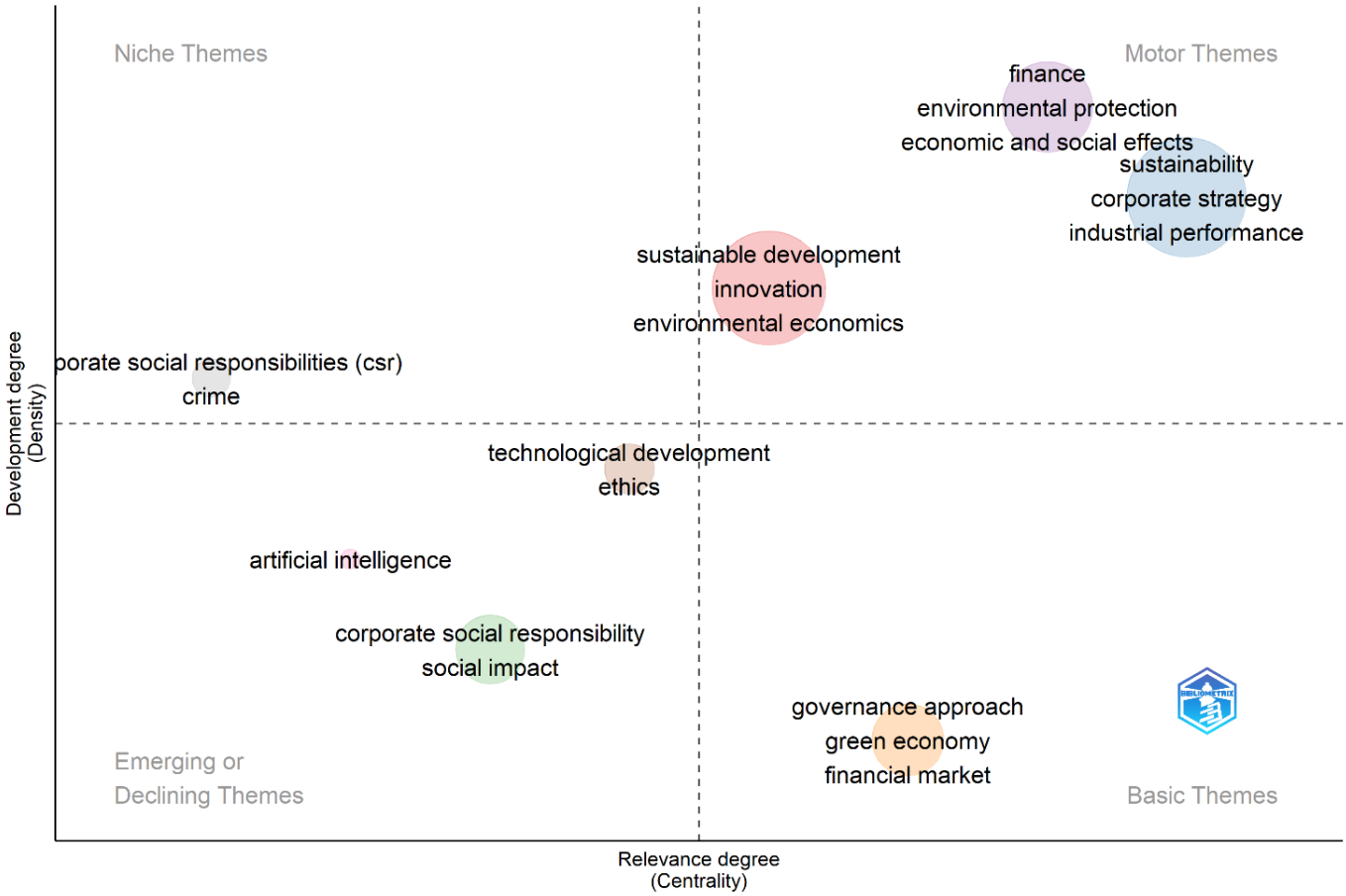
Figure 6. Thematic map



Source: Authors' elaboration using the Bibliometrix R-package. The thematic map plots clusters of topics based on their development (x-axis) and centrality (y-axis). Areas such as corporate strategy, AI, and sustainable development appear as emerging yet influential themes in accounting research.

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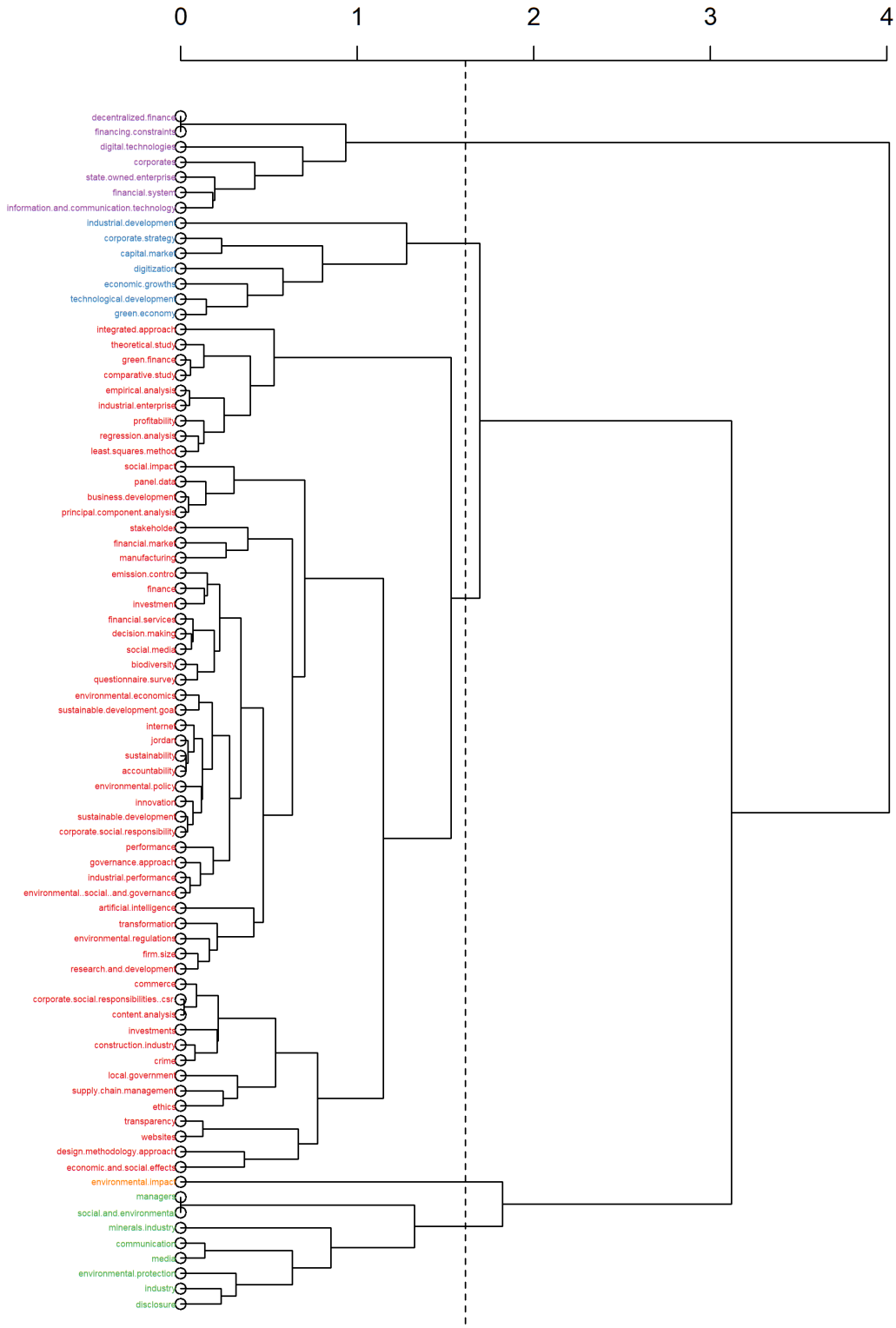
Figure 7. Topic dendrogram



Source: Authors' elaboration using the Bibliometrix R-package. This dendrogram groups research themes into five major clusters. Each cluster reflects a thematic area, ranging from sustainability and corporate governance to environmental impact and digital innovation.

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Figure 7 groups keywords related to sustainability and corporate responsibility into five clusters. Cluster 1 concentrates on core sustainability issues, namely corporate social responsibility, corporate finance, and corporate governance. Cluster 2 gathers business-oriented concepts, including corporate strategy, the green economy, and industrial performance. Cluster 3 maps sector-specific themes, for instance, environmental protection and communication. Cluster 4 highlights emerging topics, ranging from decentralized finance to digital technologies. Finally, Cluster 5 concentrates on environmental impact.

4.5 Semantic Results and Thematic Interconnections with Leximancer

The semantic analysis performed with Leximancer yields a map highlighting the three accounting paradigms that underpin the academic debate: Smart Accounting, POP Accounting, and Dialogic Accounting. The concepts of "technology," "internet," and "reporting" are strongly associated with Smart Accounting, which recognizes the use of digital tools to streamline transparent, automated, and verifiable real-time reporting and auditing processes (Awang et al., 2024; Desplebin et al., 2021), thereby supporting more robust systems. At the same time, Fatzel et al. (2024) emphasize persistent challenges related to standards, ethics, and gaps in digital competencies. In contrast, "performance," "corporate," "environmental," and "disclosure" are linked to POP Accounting, which seeks to promote comprehensive reporting, measure environmental and social impact, and ensure accessible communication with citizens and stakeholders (Biancone et al., 2024). Here, the notion of performance extends beyond economic efficiency to include social, environmental, and participatory dimensions, consistent with stakeholder capitalism. The integration of digital instruments, such as sentiment analysis, enables participatory financial statements to evolve in more collaborative and interactive ways (Biancone et al., 2024; Abbas & Shahid, 2024). The domain of Dialogic Accounting emerges in the semantic cluster through concepts such as "social," "management," and "disclosure," portraying accounting as a deliberative arena for diverse stakeholders. Bellucci et al. (2019) note that the effectiveness of Dialogic Accounting depends on the intensity and quality of stakeholder engagement, yet empirical findings suggest that such engagement is often declared rather than implemented. Bessieux-Ollier et al. (2023) underscore the shift from "accounting for people" to "accounting with people," advocating an emancipatory form of accounting grounded in dialogical rather than purely representative logic.

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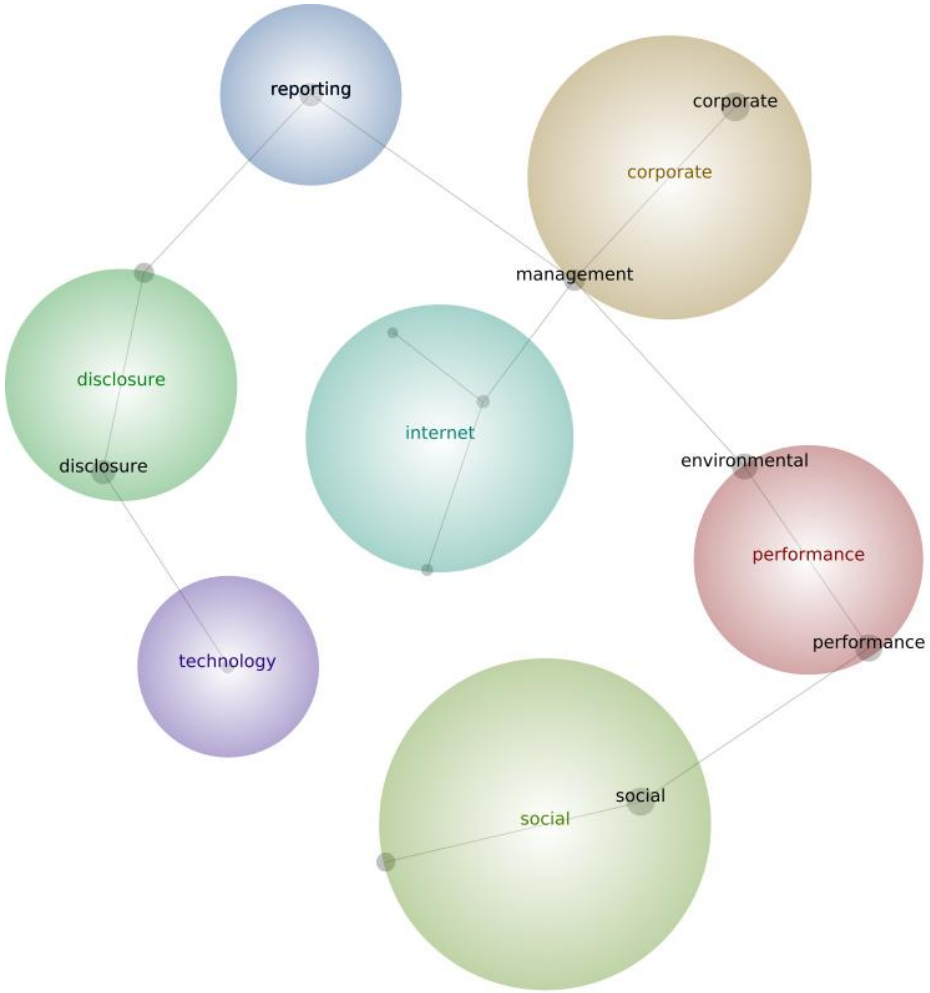
Figure 8. Thematic Clusters of Smart, Pop and Dialogic Accounting: A Conceptual Analysis with Leximancer



Source: Authors' elaboration using Leximancer. This figure visualizes the conceptual structure of the research field using multidimensional scaling (MDS). It highlights thematic groupings based on the co-occurrence of keywords, showing how core concepts like sustainability, stakeholder engagement, and digital technologies are positioned relative to each other in the academic debate.

5. Discussion

The bibliometric analysis of Smart Accounting, POP Accounting, and Dialogic Accounting provides a comprehensive view of the current scholarly landscape and the evolving nature of these interconnected paradigms. The findings reveal a growing interest in these models and a clear semantic and conceptual convergence among them. Keyword clustering shows that terms such as "sustainability," "stakeholder engagement," "AI," and "transparency" frequently co-occur, indicating that once distinct paradigms are increasingly overlapping.

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This corroborates Biancone et al. (2024),who emphasize the integration of social, technological, and participatory elements in both theory and practice. Bibliometric evidence reinforces this interpretation, showing that the semantic evolution of key concepts reflects the progressive hybridization of paradigms. For example, terms historically linked to CSR and stakeholder dialogue now appear within clusters focused on AI, blockchain, and automation, suggesting that Smart, POP, and Dialogic Accounting are becoming interwoven. Co-citation analysis supports this trend, with foundational works on sustainability reporting and stakeholder theory cited alongside emerging literature on algorithmic auditing, digital finance, and automated control systems. This interdisciplinary pattern aligns with Bessieux-Ollier et al. (2023), who call for a dialogic, inclusive, and context-sensitive approach to accounting innovation. Nonetheless, several critical issues emerge. The selection of sources, based primarily on Scopus and Google Scholar, while ensuring broad coverage, may exclude significant studies not indexed in these databases. Aureli, Foschi and Paletta (2023) warn of the risks of overlooking niche but theoretically rich contributions, particularly in circular and participatory accounting domains. Another concern relates to the geographical distribution of contributions. Mapping international collaborations shows an intense concentration in high-income countries, particularly China, Australia, Italy, and the UK, while regions such as sub-Saharan Africa and South Asia remain markedly underrepresented. This supports Biancone et al. (2024), who observe that research on participatory accounting in emerging economies is still limited. Greater attention to these regions could foster the emergence of context-sensitive models more attuned to local socio-economic realities. Despite the steady increase in publication volume, the declining average number of citations per article since 2010 suggests fragmentation within the academic discourse. This may reflect the proliferation of open-access and preprint platforms, which reshape citation practices and accelerate the diffusion of highly specialized contributions (Aminu Abdullahi & Abubakar, 2024). While this dynamic indicates growth, it also risks theoretical disconnection and reduced cumulative knowledge. Therefore, although bibliometrics offers robust insights into structural trends, the field would benefit from greater methodological pluralism. As Bessieux-Ollier et al. (2023) argue, integrating interpretive and qualitative methods can capture the nuanced theoretical tensions that purely quantitative approaches may overlook. In particular, incorporating voices from underrepresented contexts would enhance the field's inclusivity, maturity, and practical relevance. Without such integration, there is a tangible risk of overlooking emerging practice-based innovations that are essential for redefining accounting in response to digital transformation, sustainability challenges, and demands for stakeholder participation.

6. Conclusion

This paper presents a bibliometric analysis aimed at tracing the evolution, convergence, and research gaps in the academic debate on Smart Accounting, POP Accounting, and Dialogic Accounting from 2010 to 2025. The study examined the progression of these paradigms, highlighting their conceptual intersections and revealing critical areas that remain underexplored, particularly with respect to normative, ethical, and geographical inclusivity. In response to RQ1, the findings confirm a consistent and significant increase in academic output, especially from 2019 onward, reflecting a broader scholarly orientation toward digital innovation and sustainability.

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Smart Accounting has gained momentum through the integration of technologies such as artificial intelligence (AI), blockchain, and automation in financial processes (Desplebin et al., 2021; Awang et al., 2024). POP Accounting has evolved in parallel with stakeholder capitalism, advancing inclusive and accessible reporting mechanisms (Biancone et al., 2024). Dialogic Accounting, grounded in participatory governance, continues to stress the ethical and democratic dimensions of financial communication (Bellucci et al., 2019; Bessieux-Ollier et al., 2023). With regard to RQ2, keyword co-occurrence and thematic clustering demonstrate an increasing conceptual convergence. Smart Accounting prioritizes transparency and operational efficiency; POP Accounting is oriented toward social value and stakeholder responsiveness; Dialogic Accounting introduces a deliberative logic that supports accountability and inclusive engagement. Advanced tools such as sentiment analysis (Biancone et al., 2024) and life cycle assessment (Aureli, Foschi & Paletta, 2023) illustrate how technological and participatory approaches are being jointly applied in public sector financial reporting. In addressing RQ3, the analysis identifies significant gaps in the literature. Although international collaborations are well developed among countries such as China, Australia, Italy, and the United Kingdom, contributions from regions such as sub-Saharan Africa, South Asia, and Latin America remain underrepresented. This geographical imbalance limits the inclusion of culturally embedded and institutionally diverse perspectives on accounting innovation. Research from these regions is closely linked to development objectives, legitimacy, and public accountability. Such contexts have the potential to generate context-sensitive and participatory models (Fusco & Ricci, 2019; Abbas & Shahid, 2024). Moreover, the ethical and regulatory implications of accounting innovation remain insufficiently addressed in the literature, despite their growing importance in digital and sustainability-oriented transformations.

6.1 Theoretical and Practical Contributions

Theoretically, this study supports the emergence of a hybrid paradigm that integrates the core principles of Smart, POP, and Dialogic Accounting. This convergence is not only technical but also ethical and institutional, reflecting a broader transformation of accounting from a neutral reporting instrument into a vehicle for social legitimacy and stakeholder empowerment. By combining automation with participatory logic and sustainability objectives, hybrid models provide a framework for resilient, transparent, and democratically accountable financial practices across both public and private sectors (Vo Van et al., 2024; Biancone et al., 2024).

6.2 Limitations

Despite its contributions, the study presents some methodological limitations. The 2010–2025 period was chosen to capture recent developments, but it may have omitted significant contributions published prior to 2010, particularly in social accounting and participatory reporting. This exclusion may constrain understanding of the historical roots of the phenomenon. For instance, Brown and Jones (2015) demonstrate that the theoretical foundations of dialogic accounting had already been developed in the early 2000s. Another limitation concerns the declining average number of citations per article over time.

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This phenomenon may be associated with the fragmentation of academic debate and the expansion of open-access and preprint platforms, which have altered traditional citation dynamics (Aminu Abdullahi & Abubakar, 2024).

7. Future Research Directions

Multiple future research directions emerge from this study. First, scholars should complement bibliometric mapping with qualitative methodologies such as case studies, interviews, and ethnography to gain deeper insight into how Smart, POP, and Dialogic Accounting models are implemented in specific socio-political and organizational contexts (Bessieux-Ollier et al., 2023). Second, greater emphasis should be placed on geographical inclusivity. Research from emerging economies, particularly in sub-Saharan Africa, South Asia, and Latin America, remains underrepresented. Comparative studies across institutional settings could illuminate how diverse cultural, regulatory, and developmental conditions shape the evolution of hybrid accounting models (Alessi et al., 2024; Abbas & Shahid, 2024). Third, future investigations should examine how emerging technologies such as artificial intelligence, blockchain, cloud computing, and machine learning can enhance stakeholder engagement, ESG reporting, and real-time accountability. These technologies create opportunities for designing integrated systems in which automation and participation operate in synergy. However, this integration must be informed by ethical frameworks that address privacy, algorithmic bias, accessibility, and the digital divide. Finally, future research should explicitly engage with the normative dimensions of accounting innovation. As accounting becomes increasingly data-driven and digitally mediated, it is essential to ask who benefits from such systems, whose voices are included, and what values they promote. A truly transformative accounting paradigm must integrate methodological plurality, technological innovation, and ethical reflection within a global and context-sensitive perspective.

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