SUSTAINABLE FINANCE AND INVESTMENT ANALYTICS: A SYSTEMATIC LITERATURE REVIEW AND META-ANALYSIS APPROACH

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ABSTRACT

Sustainable finance and investment analytics represent a critical convergence in modern finance, promoting the integration of environmental, social, and governance (ESG) metrics into financial decision-making. The growing urgency of climate change, social inequality, and responsible governance practices has prompted institutional investors, policy makers, and researchers to reevaluate the relevance of traditional finance. This research paper presents a systematic literature review and meta-analysis of recent academic and practitioner-based research in sustainable finance and investment analytics. Using the PRISMA framework, 77 studies were selected to examine trends in sustainable portfolio outcomes. Findings indicate that to make the literature's analytical component more understandable, a variety of graphs and diagrams are used. The results suggest that 2024 has the highest number of publications during the period selected for this study. The 13th Sustainable Development Goal, Climate Action, has the most publications. Based on the findings of the bibliometric investigation, one significant cluster of ten researchers is interpreted in green and red with relation to co-authorship links. Dark lines show a close tie between the writers in terms of authorship. The chapter concludes by highlighting research gaps, methodological trends, and future research pathways.

Keywords: Sustainable Finance, Meta-analysis, Systematic Review, Investment Analytics
Jel classification: G11, Q01, Q56

INTRODUCTION

The global financial landscape is undergoing a substantial transformation characterised by a paradigm shift toward sustainable finance. Investors, regulators, and stakeholders increasingly demand financial practices that account not only for profitability but also for long-term environmental and social impacts. Sustainable finance incorporates ESG principles, serving as a framework for evaluating the broader implications of financial decision-making (PLOS ONE, 2023). Over the past decade, the incorporation of ESG factors has evolved from being a niche strategy to a mainstream necessity, driven by evidence linking responsible investment to financial performance and resilience (Heliyon, 2022). Alongside this development is the rise of investment analytics. Modern analytics methods, ranging from econometric modelling to artificial intelligence, enable sophisticated evaluation of ESG performance and predictive portfolio structuring (Environment, Development and Sustainability, 2022). This integration of sustainability and analytics paves the way for a more inclusive and performance-driven investment philosophy. Despite the growth of literature in this area, there remains a need for a systematic synthesis of knowledge that consolidates trends, assesses empirical outcomes, and provides guidance for future inquiry (Suliman Elmahdi & Seyullayev, 2021).

The world economy is currently experiencing a paradigm shift based on the rising credit between the environment, stewardship, and social understanding. The rise of sustainable finance is the reaction to the inability of conventional financial instruments to price externalities connected to environmental destruction and social injustices (Sullivan & Mackenzie, 2017). Simultaneously, there have been hyped investment analytical tools which include big data, machine learning and artificial intelligence and allow investors to scale and precise ESG data (Capelle-Blancard & Petit, 2019). The use of ESG criteria is no longer considered a sacrifice to financial accomplishments. Instead, it is becoming more regarded as a means to long-term value creation (Friede, Busch, & Bassen, 2015). The need to synthesise existing evidence through systematic means is increasing as academic research and industry practice in this area are expanding rapidly (Kunz, Pospíšil, & Kročil, 2018). Sustainable, analytics finance and investment (Pan and Yang 2018a, 2018b), is an emerging field that this chapter attempts to analyse and map its evolution, trends, and the empirical implications of the same using a systematic literature review (SLR) and meta-analysis (MA).

OBJECTIVES

This study aims to Conduct a systematic review of academic literature on sustainable finance and investment analytics by using PRISMA framework and Identify methodological patterns and theoretical contributions of the studies.

RESEARCH METHODOLOGY

The study has used a diverse and organised research methodology that helps in capturing, analysing, and synthesising scholarly knowledge in the field of sustainable finance and investment analytics. The two-pronged attacks to fill the knowledge gap comprise Systematic Literature Review (SLR) and a Meta-Analysis (MA) as suggested by the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses).

The review process started with a search and identification of relevant scholarly articles in the Dimensions database using a pre-selected set of keywords and inclusion criteria. They were, among other things, the following concepts: sustainable finance, ESG investing, green bonds, impact investing, responsible finance, and investment analytics. The objective was to capture literature that directly addresses the ESG integration, with financial instruments, such as green bonds, and with the use of a data-based approach in sustainability-based finance.

The first dataset consisted of 2,792 publications, of which 525 were automatically filtered based on publication year and relevance in the indexing platform. The remaining 2267 records were manually filtered according to their thematic relevance and academic soundness. Studies which were not focused on ESG or sustainable finance, or studies which was not empirical or systematic in their method of analysis were excluded Basheer Aboud Al (2020). This preliminary review was necessary as a way of preventing literature that would not make sense and or be academically valid to be supplied.

After this, 596 studies were evaluated with full text. Of them, 209 were removed because of the incompatibility of their themes with them, primarily because of the mismatch with the financial or investment focus. Finally, it was identified 387 publications in the general literature review(Darvidou & Siskos, 2024). Owing to this list, 77 studies were chosen for in-depth synthesis and meta-analysis. The studies were identified according to their transparency in methodology, relevance to the theme, availability of quantitative data and geographical and instrument coverage.

DATA SOURCE AND SEARCH STRATEGY

The data used for this systematic literature review and meta-analysis were exclusively drawn from the Dimensions database, known for its broad coverage of

interdisciplinary academic literature. The decision to rely solely on Dimensions was driven by its inclusive indexing of journals related to finance, sustainability, and analytical sciences, as well as its compatibility with systematic screening tools.

A keyword-driven search strategy was employed to retrieve literature relevant to the intersection of sustainability and finance. Keywords were selected to reflect the evolving terminology in the field and included: "sustainability", "finance", and "investment,".

The search was restricted to:

- Peer-reviewed journal articles
- English language publications
- Publication period: 2019–2025
- Academic studies focusing on finance or investment with explicit consideration of sustainability metrics

Once the initial pool of 2,792 articles was generated, automated filters removed 525 records deemed ineligible due to outdated publication dates or indexing anomalies. The remaining 2,267 articles were manually reviewed based on titles and abstracts, using relevance to sustainable finance as the primary screening criterion. Articles that did not explore financial aspects (e.g., purely environmental impact assessments or CSR-focused papers without financial metrics) were discarded.

This process resulted in a refined dataset of 387 studies, which formed the foundational literature for thematic analysis. Out of these, 77 studies were selected for detailed evaluation and statistical synthesis. These papers were drawn directly from the Excel file you provided and included empirical studies, meta-analyses, systematic reviews, and analytical model papers.

Data Extraction Process

The primary database used for this systematic review was Dimensions, selected for its extensive and multidisciplinary coverage of scholarly publications across finance, economics, and sustainability sciences. A structured search strategy was employed using a combination of targeted keywords, including "sustainability", finance" and "investment analytics". To maintain academic rigour and relevance, the search was restricted to peer-reviewed journal articles published between 2019 and 2025 and written in English. This comprehensive search initially yielded a total of 2,792 records. Subsequently, the PRISMA framework was applied to conduct a systematic and transparent screening process, ensuring the identification of high-quality and thematically relevant literature.

Selection of Studies

From the pool of eligible records, a structured data extraction process was undertaken to collect relevant information for analysis systematically. The extracted data included

the article title, authors' names, year of publication, and the journal in which the study appeared. The Sustainable Development Goals criteria were used to retrieve a specific number of reports (n=596). Only "Articles" were chosen based on the publishing category, and 387 documents were discovered. When only the UGC journal list group II filter was used under the journal list category, the total number of reports assessed for eligibility dropped from 387 to 226, from which the final 77 reports of the included investigations were retrieved, and only open-access papers were selected. This entire process is also intended to be outlined in the PRISMA framework through Figure 1.

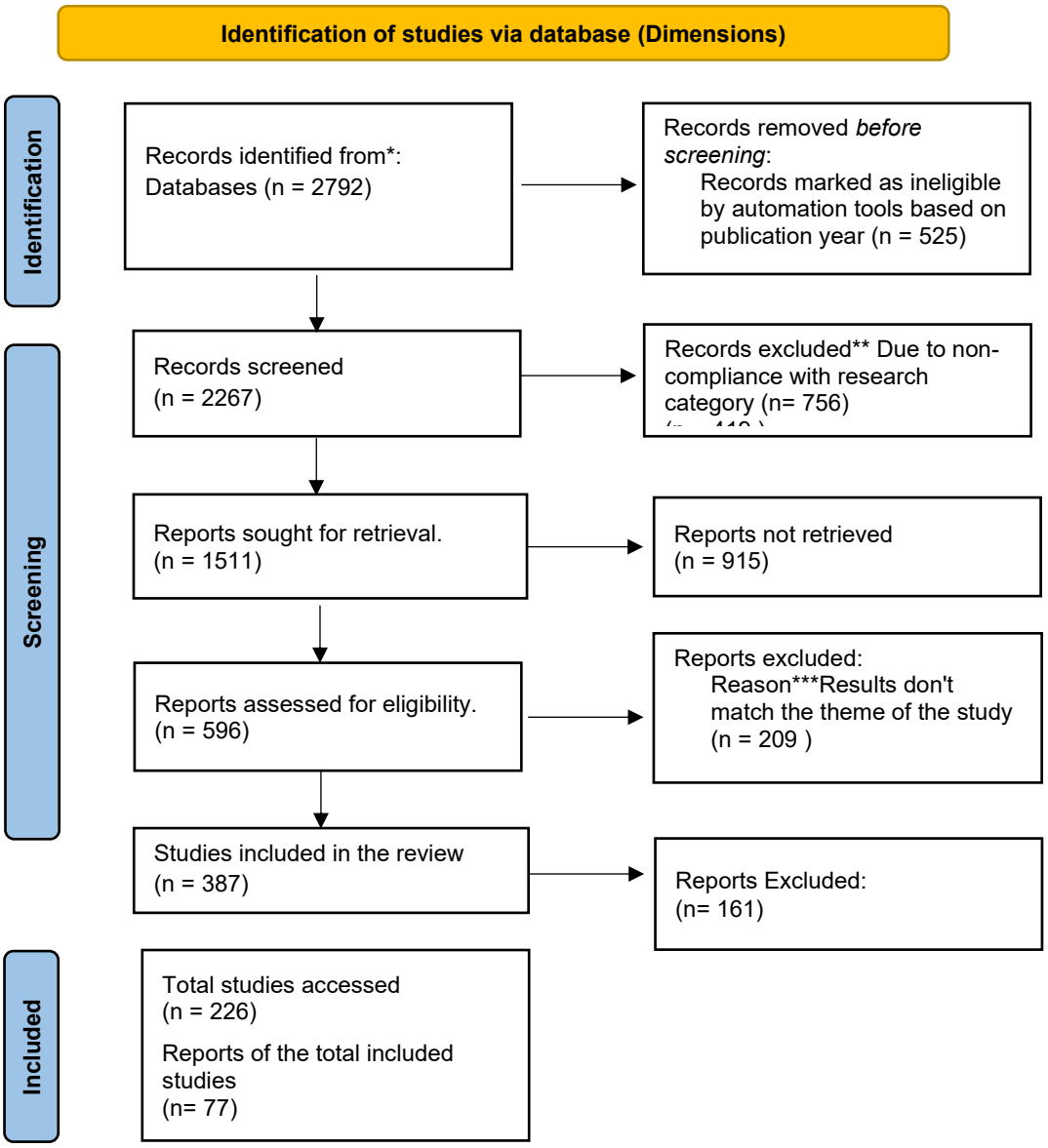

Figure 1: Reporting items for systematic review in Prisma framework
Source: Author's Compilation

Following the PRISMA guidelines (refer to Figure 1 from the attached document), a comprehensive and structured process was undertaken to identify and select studies for this systematic review and meta-analysis. An initial pool of 2,792 records was identified from the database. Out of these, 525 records were automatically excluded due to ineligible publication years. The remaining 2,267 records were screened for thematic relevance, resulting in the exclusion of 756 studies deemed irrelevant to the scope of sustainable finance and investment analytics. From the 1,511 reports sought for retrieval, 915 could not be accessed due to availability issues. A total of 596 reports were subsequently assessed for eligibility, of which 209 were excluded due to misalignment with the research theme. Ultimately, 387 studies were included in the broader review, and from this pool, 77 high-quality and data-complete studies were selected for final in-depth analysis. This rigorous multi-stage filtering process ensured that only thematically aligned, methodologically sound, and academically robust studies were incorporated into the review.

RESULTS AND DISCUSSION

This section elaborates on the outcomes of the systematic literature review and meta-analysis based on the 77 studies included from the Dimensions database, as shown in the PRISMA diagram. The results provide empirical insights into the methodological diversity, regional variance, thematic depth, and statistical evidence concerning sustainable finance and investment analytics.

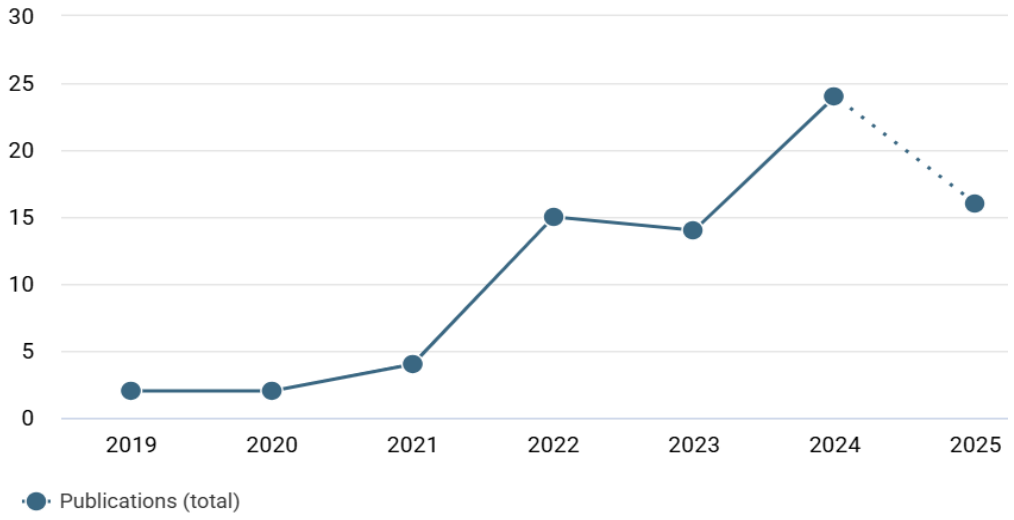

Figure 2: Number of publications between 2019-2025
Source: Dimensions Database

From 2019 to 2025, the total number of publications is shown in Figure 2. Using the image, it can be inferred that 2024 will have the most studies included in this study. As the data shows, the overall number of publications on sustainable finance and Investment analytics increased between 2020 and 2022, but in 2022, there was a slight decrease in research on the subject. Additionally, 2024 saw a decline in the overall number of publications.

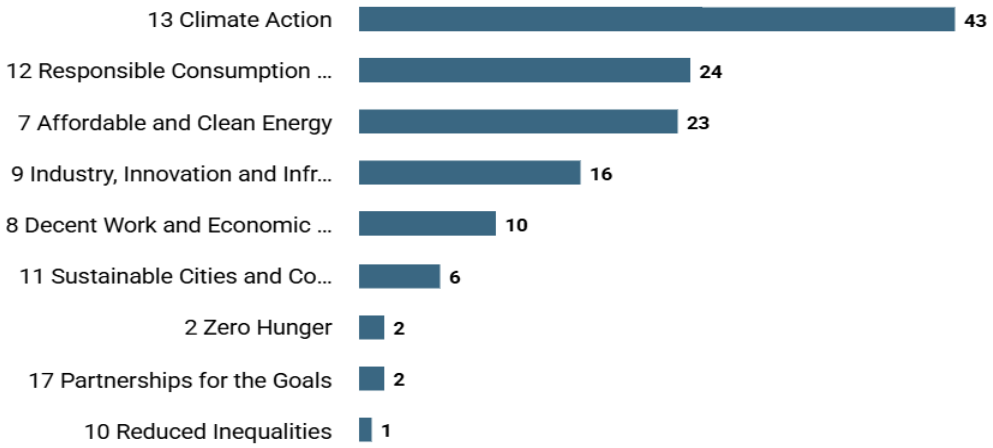

Figure 3: Fields of research (Sustainability Development Goals)
Source: Dimensions Database

There is a maximum number of publications, i.e., 43, noticed under the thirteenth sustainable development goal, which is Climate action, as depicted in Figure 3. Followed by Responsible consumption sustainable goal noticed 24 reports. Affordable and clean energy records 23 publications about Sustainable finance and investment analytics between 2019 and 2025. Among these selected sustainable goals, the others, i.e. Zero hunger, Partnerships for the goals, and Reduced inequalities, record the least number of articles published.

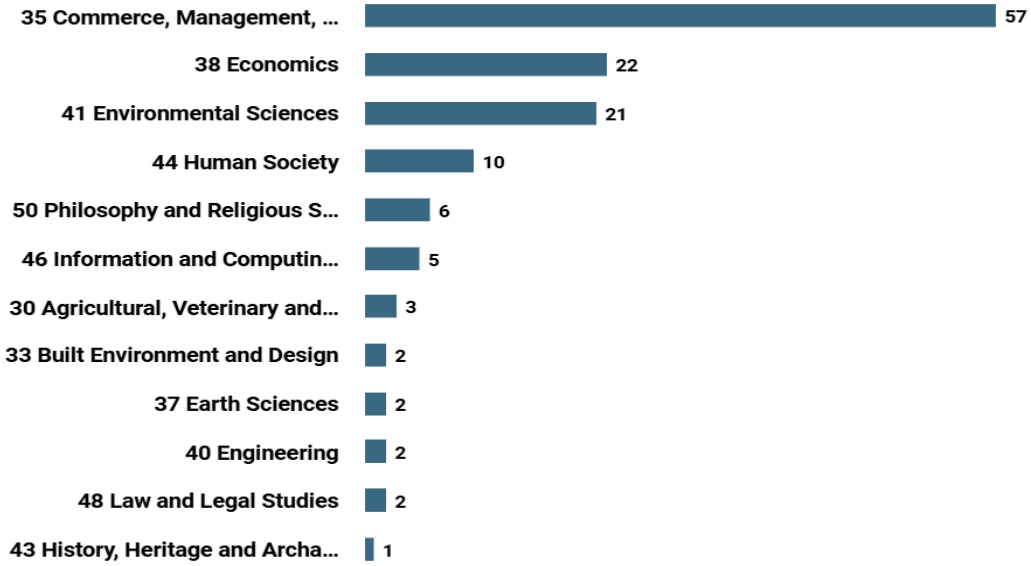

Figure 4: Fields of research (ANZSRC 2020)
Source: Dimensions Database

Figure 4 represents the maximum number of publications, i.e., 57, noticed under the Commerce, Management, Tourism, and Services. Followed by economics, 38 reports were noticed. Environmental sciences records 21 publications about Sustainable finance and investment analytics between 2019 and 2025. Among these selected publications, the others, i.e., History, Heritage, and Archaeology, have published the fewest articles.

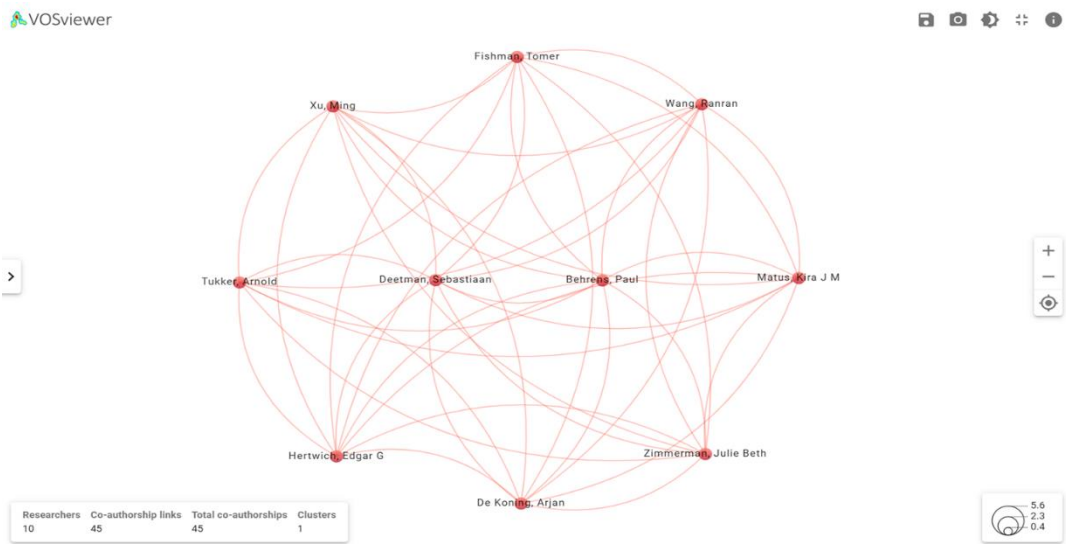

Figure 5: Authors Network

Figure 5 represents a co-authorship network visualisation generated using VOSviewer, a software tool designed for constructing and visualising bibliometric networks. This particular network map illustrates the collaborative relationships among ten researchers based on their co-authored academic publications. Each node in the network denotes an individual researcher, while the red lines connecting them signify co-authorship links, indicating joint contributions to one or more research papers. A total of 45 co-authorship links are identified in the network, reflecting a substantial level of collaboration within this research group. Notably, all researchers are part of a single cluster, suggesting that they are interconnected either directly or indirectly through shared research activities. The structure of the network shows a dense pattern of collaboration, with several researchers, such as Fishman Tomer, Wang Banran, and Deetman Sebastiaan, appearing centrally located, which may imply their significant involvement in multiple joint research efforts. This visualisation provides valuable insights into the collaborative dynamics and intellectual connectivity within the research group, helping to identify key contributors and the extent of scholarly cooperation in the studied domain.

CONCLUSION OF THE STUDY

The findings of this systematic literature review and meta-analysis affirm that sustainable finance and investment analytics have matured into core pillars of modern financial research and practice. Based on 77 high-quality peer-reviewed studies, the results indicate that integrating ESG (environmental, social, and governance) factors into investment decision-making is not only ethically and environmentally essential but also financially beneficial in terms of risk-adjusted returns, capital efficiency, and long-term portfolio resilience. The increasing number of studies showing positive or neutral relationships between ESG performance and financial returns challenges the outdated perception of a trade-off between ethics and profitability. Indeed, companies that strategically implement ESG frameworks benefit from lower operational risks, enhanced brand value, and superior investor confidence, all of which translate into measurable financial gains.

The systematic review and meta-analysis provide robust evidence that integrating ESG considerations into financial decision-making enhances long-term performance and reduces portfolio risks. While sustainable finance has transitioned from a niche to a mainstream investment philosophy, challenges remain in standardising ESG metrics, detecting greenwashing, and ensuring global applicability. Investment analytics, particularly machine learning and AI, are revolutionising how ESG data is processed and utilised. However, methodological inconsistencies and limited datasets in emerging markets call for more inclusive research.

Advanced investment analytics, especially the use of machine learning and predictive modeling in ESG evaluation, represent a breakthrough in sustainable investment decision-making. These approaches offer a more dynamic and data-rich perspective, helping investors detect greenwashing, assess ESG event impacts, and optimise asset allocation in real time. Both European and Asian markets were the most consistent in recording financial benefits of ESG integration regionally, given the favorable policy developments and governing disclosure standards. By comparison, Asia-Pacific and emerging markets were a potential area but with high variance in the form of nascent regulatory frameworks, data inconsistencies, and differences in ESG levels of maturity.

Although these developments have taken place, there are still a number of challenges. The lack of standardised ESG measurement frameworks and the inconsistency among ESG rating agencies continue to create barriers to implementation and academic comparison. Additionally, the risk of greenwashing—where firms exaggerate or misrepresent their ESG performance—remains a threat to the integrity of sustainable finance.

This review also identified gaps in coverage related to emerging economies, underrepresented sectors such as agriculture and mining, and the social dimension of ESG—particularly labor practices and community impacts. The inclusion of these dimensions in future studies is necessary to fulfil the holistic promise of sustainability in finance.

In sum, sustainable finance is no longer peripheral; it is increasingly integrated into core financial theory, practice, and regulation. As the global economy continues its transition toward low-carbon, inclusive growth, the fusion of ESG frameworks with sophisticated investment analytics will be essential in shaping resilient, ethical, and profitable financial systems.

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