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Inventory Management

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ABSTRACT

This study examines the application of Operations Research (OR) techniques to inventory management through a bibliometric analysis of Scopus-indexed literature. The search strategy used the query “inventory management AND operations research” across article titles, abstracts and keywords, producing 1,681 records for the 2000–2026 analytical period. The supplied bibliometric export contains 1,678 article occurrences across 749 source entries, and the distinction between the screened records and exported occurrences is retained transparently. Annual publication output increased from 13 articles in 2000 to 191 in 2025; the 2026 count of 158 is treated as provisional. Source, thematic and conceptual analyses identify inventory control, supply chain management, operations research, optimization and decision-making as central themes. Sustainability is a distinct developed theme, while machine learning and artificial intelligence are increasingly connected with inventory decision support. The paper reviews classical inventory models, mathematical programming, allocation and network methods, supply-chain coordination, and emerging analytics. It concludes with a research agenda focused on integrating prediction and optimization, adaptive control under uncertainty, sustainability, resilient supply chains, real-time data, and empirical model validation.

Keywords: Operations Research, Inventory Management, Inventory Control, Supply Chain Management, Bibliometric Analysis, Optimization, Sustainability, Machine Learning.

1. INTRODUCTION

Every organisation that manufactures, distributes, or stocks a physical product eventually confronts the same underlying question: how much inventory to hold, when to replenish it, and how to keep the resulting costs from spiralling out of control. Inventory management sits at the heart of this question and occupies a permanent place within the broader functional area of Operations and Production. Firms operating in very different sectors, such as manufacturing, retail, healthcare and e-commerce, all face the same trade-off between the risk of running out of stock and the cost of holding too much of it. This trade-off has made inventory management one of the most enduring and practically significant areas of Operations Research (OR) scholarship.

Operations Research offers a systematic, quantitative approach to inventory decisions. Rather than relying on intuition or fixed rules of thumb, OR equips managers with mathematical and statistical models, from classical economic order quantity formulations to stochastic and multi-echelon inventory systems, that translate uncertain demand, lead times, and cost structures into defensible decisions about order quantities, reorder points, and safety stock levels. The Operational Research Society (no date) describes OR as the application of advanced analytical methods, such as mathematical modelling, optimisation, simulation, and data analytics, to improve decision-making in complex organisational settings, and inventory management is arguably one of the clearest illustrations of this discipline in practice. Merigó and Yang (2017) also note that OR and management science journals have built up a large and fairly technical body of work over the years, of which inventory-related problems form a significant part. Where an operations manager once had to balance product availability against holding, ordering, and shortage costs largely through experience, OR now allows this balance to be modelled, tested, and optimised.

This growing reliance on OR to solve inventory problems is precisely what motivates the present study. The authors examine the application of Operations Research methodologies and quantitative decision-making techniques to inventory management, and trace how research in this area has developed over time. More specifically, the review is concerned with inventory management from an OR perspective rather than with inventory management as a generic business function. The paper is therefore less interested in how inventory is managed in general terms and more interested in how it has been modelled, optimised, and solved using quantitative OR tools.

To capture the intellectual structure of this field, the authors conducted a systematic bibliometric search using Boolean combinations of key phrases related to Operations Research or Operations Management, and Inventory Management, Inventory Control, or Inventory Optimisation, over the period 1990–2026. Individually, the underlying keyword sets returned substantial volumes of literature: ‘Inventory Control’ alone yielded 481,000 results, ‘Inventory Management’ 298,000, and ‘Inventory Optimisation’ 24,700, confirming that inventory management has been a well-established field of enquiry since at least the 1990s. When these keyword sets were combined specifically with Operations Research and Operations Management terminology, the search narrowed to 709 documents. After the removal of duplicate records, this produced a working database of 698 unique articles, in line with the kind of Identification–Screening–Eligibility–Inclusion process recommended for systematic bibliometric reviews (Aria and Cuccurullo, 2017). This database was exported in RIS format for further processing. Records with incomplete metadata (such as missing author or source fields, which the bibliometric software cannot process) were then removed, leaving a final analysable dataset of 622 records that is used for the Data Analysis section and discussed further in the Conclusion.

One preliminary but notable observation from this screening process is that, while inventory management research has a long history, studies that specifically combine Operations Research or Operations Management with optimisation-oriented inventory techniques have increased markedly since 2020. This suggests a renewed and intensified interest in the quantitative, optimisation-driven side of inventory decision-making, plausibly linked to the operational disruptions and supply-chain pressures that have affected firms globally since the onset of the COVID-19 pandemic.

The literature captured in this database spans several interconnected themes: inventory control policies, inventory optimisation, production and inventory planning, stochastic inventory systems, supply-chain inventory management, remanufacturing and returns, sustainable inventory management, and technology-supported inventory decision-making. This mix of themes is broadly consistent with other recent bibliometric reviews in the area, such as Mahajan et al. (2024) on inventory management and TQM practices, and Fahimnia, Sarkis and Davarzani (2015) on green supply chain management, both of which also find sustainability and supply-chain themes becoming more prominent in recent years. Taken together, these themes reflect not only the technical evolution of OR methods but also the widening relevance of inventory management: academically, as a maturing sub-field bridging OR and supply-chain research; managerially, in equipping practitioners with defensible, model-based tools for cost–service trade-offs; socially, given that efficient inventory systems directly affect product availability, price stability, and waste; and, increasingly, from a policy standpoint, as sustainability and circular-economy considerations reshape how firms think about returns, remanufacturing, and stock disposal.

The remainder of this paper builds on this foundation. Following this introduction, the Literature Review situates the study within prior bibliometric and conceptual work on inventory management and Operations Research. The Research Methodology section details the search strategy, screening criteria, and analytical tools in full. The Data Analysis section then examines publication trends, contributing authors and institutions, thematic clusters, and citation patterns drawn from the final database of articles. The paper closes with a discussion of the study’s implications and a proposed agenda for future research, which is revisited in the Conclusion below.

2. LITERATURE REVIEW

This section reviews the current literature of Operations Research (OR) and inventory management in which this study is positioned. It is structured around the families of OR techniques that are used to formulate and solve inventory problems: basic OR concepts, classical inventory models, linear and mathematical programming, allocation models (transportation and assignment), and network-based project scheduling. It then discusses supply-chain coordination, the newer themes of analytics, sustainability and disruption and finally earlier reviews and the gap this study fills.

2.1 Operations Research as a Decision Science and Its Role in Inventory Decisions

The Operational Research Society (no date) describes. As the use of advanced analytical methods, such as mathematical modelling, optimisation, simulation and data analytics to improve decision-making in complex organisational settings. Standard textbooks present the field as a toolkit of probabilistic models that help managers allocate scarce resources across functions such as production, logistics and project management (Vohra and Arora 2021; Taha, 2022; Hillier et al. 2025). Merigó and Yang (2017) show that OR and management science journals have accumulated a technically demanding literature, in which inventory-related problems form a substantial part.

Inventory management is an application because it contains the trade-off that OR is designed to resolve: holding too much stock raises storage and capital costs while holding too little causes shortages and lost sales. Pourhejazy and Kwon (2016) reviewed than 380 articles published between 2005 and 2016 that apply advanced OR techniques to supply chain network optimisation with inventory policies one of the decision areas, alongside facility location and transport routes. Dekker, Bloemhof and Mallidis (2012) likewise show how OR contributes to logistics decisions that carry as well as cost consequences. The practical payoff is documented by Farasyn et al. (2011) Who report that Procter & Gamble reduced its inventory investment over a decade by combining OR with its structure first through spreadsheet-based models that optimised each supply chain stage and later through multi-echelon optimisation software and who link this to cash savings of \$1.5 billion in 2009.

2.2 Classical Inventory Control Models

The economic order quantity (EOQ) the reorder-point model and base-stock policies form the core of inventory theory and a large share of the literature extends the economic order quantity (EOQ) the reorder-point model and base-stock policies to new conditions. Huang (2007) develops an economic order quantity (EOQ) model that allows a delay in payments under conditions while Ferguson, Jayaraman and Souza (2007) apply an economic order quantity (EOQ) model that uses a nonlinear holding cost to perishable goods. Corbett (2001) studies the order quantity and reorder point (Q r) model when the supplier and buyer have conflicting incentives and private information showing that allocating decision rights changes efficiency. Ettl et al. (2000) Build a supply network model that sets base-stock levels at each stocking point in order to minimise inventory capital while meeting customer service requirements. Uncertainty is mainly handled by safety stock. Gonçalves, Sameiro Carvalho and Cortez (2020) carried out a review of OR models and methods for dimensioning safety stock showing the focus of the field on safety stock dimensioning. Where products are perishable or demand is irregular richer methods are used. Haijema, van der Wal and van Dijk (2007) combine Markov programming with simulation to set production and ordering rules for blood platelets, which have a shelf life of only five to seven days. Specialised contexts have produced reviews, such as Zhang, Huang and Yuan (2021), on spare parts inventory, where Satir, Savasaneril and Serin (2012) show that pooling stock through lateral transshipments can benefit service centres in a decentralised network.

2.3 Linear and Mathematical Programming Approaches

Linear programming (LP) turns a decision problem into a math setup. It uses decision variables, a straight-line goal to either maximize or minimize and straight-line limits. This all depends on four ideas: things scale evenly (proportionality) parts add up without interaction (additivity) we know all values for sure (certainty) and nothing can be negative (non-negativity). These ideas come from Taha (2022) and Vohra and Arora (2021).

To solve LP problems people use tools. For two variables the graphical method works well. For problems the simplex method is common. There's also the Big-M version of simplex for cases. In life people often use spreadsheet solvers. The final simplex table gives something shadow prices. These show how much it's worth to loosen a limit like a capacity or storage cap.

In inventory work LP shows up most in production planning lot-sizing and supply chain scheduling. Stock connects one period to the next. Spitter et al. (2005) Used LP to plan supply chain operations where capacity is lead times are planned. Degraeve and Jans (2007) looked again at the capacitated lot-sizing problem, including setup times. They used a Dantzig-Wolfe reformulation and a branch-and-price algorithm.

The assumption of certainty in LP doesn't often match real life. So Mirzapour Al-e-Hashem, Malekly and Aryanezhad (2011) made a version of aggregate production planning. Their model handles costs and uncertain demand. It's a multi-objective approach.

Xia et al. (2004) Showed how math programming can help during disruptions, in a two-stage production and inventory system.

Together these studies show a path. We start with deterministic LP. Then we move to integer programming. From there we go to models and multi-objective ones. Each step adds realism and complexity.

2.4 Allocation Models: Transportation and Assignment

The transportation problem is about finding the way to send a product that is the same from different places to different places. The assignment problem is a type where each place that sends the product is matched with exactly one place that receives it. These problems are usually solved using methods that find a starting solution. Then check if it is the best. For transportation this is done with MODI and for assignment with the method (Taha, 2022; Hillier et al. 2025). Silmi Juman et al. (2021) Say that the transportation model can also be used for inventory control, planning production and inventory over periods and assigning people. They look at a situation where the amount needed and the amount available are known in ranges.

The same way of dividing things up happens whenever products need to be spread out to spots. GarcíaBenito and Martín-Peña (2021) create a model to move parts between smaller warehouses in a network that has two levels. The goal is to reduce backorders. Candas and Kutanoglu (2007) show that it is better to think about where to put facilities, where to send the products and how much stock to have together instead of one after the other. Coelho and Laporte (2013) work on an inventory-routing problem with products and vehicles. They decide how much to restock and the best way to deliver everything at the time. These studies show that allocation models are not used as examples, in books as much as they are parts of bigger models that deal with inventory and distribution together.

2.5 Network and Project-Scheduling Perspectives

Project management methods like the Critical Path Method (CPM) and the Program Evaluation and Review Technique (PERT) plan tasks using network diagrams, spot tasks and extra time and use time– cost changes and three-time estimates to deal with uncertainty (Taha, 2022; Vohra and Arora 2021). These methods have a connection to inventory. Neumann and Schwindt (2003) take project scheduling further by looking at situations where inventory is involved where things that can be kept are used up and added back over time. Ala-Risku et al. (2010) Found in a big telecom project that keeping track of site inventory and installation work is more important as the project grows bigger and more complex. A search of the Scopus database for this study shows that combining CPM or PERT with inventory is still not common so this area of study is less developed, than the others.

2.6 Supply Chain Coordination and Multi-Echelon Inventory

A major strand looks at inventory as a part of a supply chain instead of a problem at one site. Dejonckheere and colleagues in 2003 use a method to measure and stop the bullwhip effect, which is the growth of demand variability as orders travel upstream. Boule and colleagues in 2007 show that an integrated production and inventory model can reduce this variability.

Corbett in 2001 and Ettl and colleagues, in 2000 mentioned earlier bring in the contracting and network aspects. This strand fits the map of the data studied in this paper, where inventory control and supply chain management are the core clusters.

2.7 Emerging Directions: Analytics, Sustainability and Disruption

Artificial intelligence. I notice that Bertsimas and Kallus (2020) say we should move from analytics to prescriptive analytics by using data directly to set decisions. I think this idea is very relevant to ordering and stocking. Boute et al. (2022) Give a roadmap for deep reinforcement learning in inventory control.

Preil and Krapp (2022) use a Monte Carlo tree search method for inventory management. Jackson et al. (2024) Offer perspectives on generative AI in supply chain and operations management. Ivanov et al. (2021) Discuss Industry 4.0. Two recent reviews cover machine learning and the combination of OR and AI in supply chain planning (Babai et al. 2025; El Mariami et al. 2025).

Sustainability. I see that Bouchery et al. (2012) Change the EOQ into a multiobjective "sustainable order quantity" model. They also extend it to echelons. GarcíaAlvarado et al. (2017) Look at inventory management when product recovery and capandtrade rules are in place. Panigrahi and Shrivastava (2025) review how inventory automation can improve supply chain performance in emerging countries.

Resilience. I notice that Snyder et al. (2016) Review OR and MS models that deal with supply chain disruptions. Lodree and Taskin (2008) suggest an insurance risk management framework for disaster relief and for planning disruption inventory. Together with the increase in output after 2019 that this paper reports these works point to a renewed interest in optimisation, for inventory research.

2.8 Earlier Reviews and Bibliometric Studies

I have noticed that previous reviews tend to be either narrow or broad. Narrow reviews look at one problem or setting for example safety stock dimensioning (Gonçalves, Sameiro Carvalho and Cortez 2020) spare parts (Zhang, Huang and Yuan 2021) or inventory practices in small and medium enterprises (Panigrahi, Shrivastava and Kapur 2024).

Broad reviews cover supply chains or operations research as a whole, such as the bibliometric analysis of operations research and management science by Merigó and Yang (2017) the review of green supply chain management by Fahimnia, Sarkis and Davarzani (2015) and the review of inventory management and TQM practices, by Mahajan et al. (2024). Saxena et al. (2024) Used the bibliometric logic to study operations research in insurance. The science mapping tools that I used in this study follow the approach of Aria and Cuccurullo (2017).

2.9 Synthesis and Research Gap

Table 1 summarises how the main OR technique families have been applied to inventory problems in the literature reviewed above.

Table -1: OR techniques applied to inventory problems in the literature.

OR technique family	Typical inventory application	Illustrative studies
Classical inventory models (EOQ, (Q, r), base-stock)	Order quantity, reorder point, safety stock	Huang (2007); Corbett (2001); Ettl et al. (2000); Gonçalves et al. (2020)
Linear and mathematical programming	Aggregate planning, lot sizing, supply chain planning	Spitter et al. (2005); Degraeve and Jans (2007); Mirzapour Al-e-Hashem et al. (2011)
Transportation and assignment models	Stock redistribution, network design, inventory routing	Silmi Juman et al. (2021); García-Benito and Martín-Peña (2021); Coelho and Laporte (2013)
Network and project scheduling	Project inventory and storable resources	Neumann and Schwindt (2003); Ala-Risku et al. (2010)
Prescriptive analytics and AI	Data-driven ordering, reinforcement learning	Bertsimas and Kallus (2020); Boute et al. (2022); Preil and Krapp (2022)

Three observations follow. First the literature has studies that look at individual techniques or specific settings.. There are few broad reviews that show how the OR toolkit as a whole has been used for inventory over time. Second most existing reviews focus on one problem, one sector or one journal set. Some treat inventory as a small part of a larger supply chain topic. Third newer themes like analytics, sustainability and disruption are growing fast. Yet these themes have rarely been mapped against the OR core using one single dataset. To the best of the authors' knowledge this study is, among the first to map the structure of OR applied to inventory management from 2000 to 2026. It uses a Scopus-based bibliometric dataset. This study therefore adds to the existing body of technique-specific and setting- reviews.

3. RESEARCH METHODOLOGY

3.1 Research Design

Different authors have utilised systematic literature review (SLR) techniques to understand the trend in a given area. A major advantage of SLR is that it provides a comprehensive overview of literature prior studies to strengthen the foundation of knowledge (Paul & Criado, 2020). Research methodology is a systematic way to solve a problem. It is a science of studying how research is to be carried out. Essentially, the procedures by which researchers go about their work of describing, explaining and predicting phenomena are called research methodology (Rajasekar et al., 2013). The present study utilises one such technique to analyse and identify the research trends in the application of Inventory Management in Operations Research.

3.2 Article Selection, Inclusion and Exclusion Criteria

A systematic literature search was conducted using the Scopus database on 12 September 2026 to identify relevant studies addressing the relationship between inventory management and operations research. The search was performed using the keyword combination

“inventory management AND operations research”. The initial search generated a total of 3,443 documents. Although the search results included publications dating back to 1956, the present study focused specifically on relatively recent research published from the year 2000 onwards. As the first stage of the screening process, publications published before the year 2000 were excluded. Following the removal of publications prior to 2000, the number of records decreased from 3,443 to 3,019 items. The search included all subject areas such as engineering, computer science, business, management and accounting, mathematics, and others. Subsequently, publications classified as conference papers, book chapters, books, conference reviews, and other non-relevant document types were excluded from the analysis leaving 1,837 items for further screening. Languages like Chinese, Spanish, French, German, etc. were excluded, which produced 1728 items. Finally, publications categorised as trade journals, book series, conference proceedings, and other unsuitable source types were excluded and the final dataset comprised 1,681 publications.

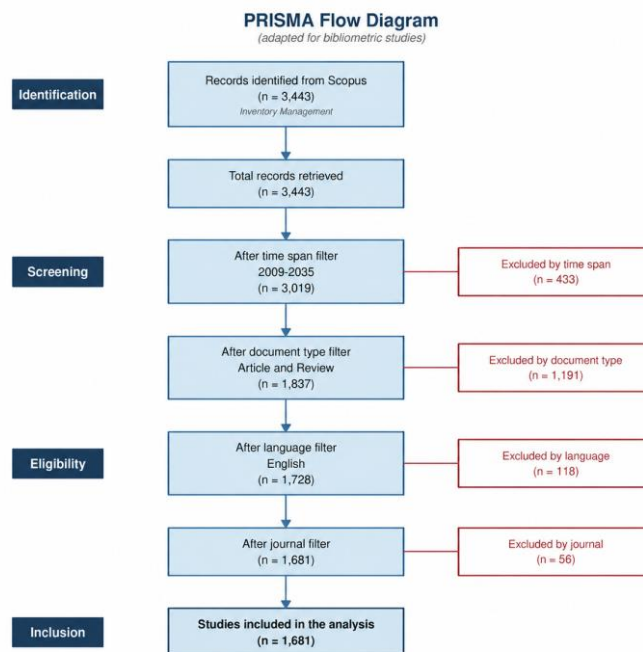


Figure -1: PRISMA screening flow, based on the supplied Scopus screening record.

3.3 Bibliometric Analysis

This study analyses bibliometric analysis which is a type of SLR. It is used for analysing large volumes of scientific data and defined as the use of statistical methods to analyse articles, conference papers, books, reviews, and affiliated documents. Filters such as year, subject area, document type, language, keyword, country, source type, author name, and more are used in this process. After filtering out all the items, RIS and BibTex files were exported in order to analyse the data. Then, RStudio was used to install “Bibliometrix” which is necessary to open Biblioshiny where the PRISMA Diagram was created. All the inputs and results were provided to make the diagram and finally BibTex file was imported to Biblioshiny which converted it into an excel supported file. The data was analysed using Tableau and VOSViewer to observe the relationship between the keywords used.

4. DATA ANALYSIS AND RESULTS

This study adopts a bibliometric data-analysis approach using the supplied Bibliometrix/Biblioshiny-style outputs and Excel datasets for the research area “Supply Chain Management- Inventory Control.” The annual production, source, thematic and conceptual datasets were examined in order to identify publication growth, important publication outlets, dominant research themes and the conceptual structure of the field. Accordingly, the results are interpreted in terms of publication trends, source concentration, geographical contribution, thematic development and conceptual relationships.

For transparency and reproducibility, the Scopus screening began with the search query “inventory management AND operations research,” searched within Article Title, Abstract and Keywords. The Scopus results page returned 1,681 documents. The screening criteria reported in the supplied Scopus record were Source type: Journal (1,681), Document type: Article (1,535) and Review (146), and Language: English (1,681). The year distribution used for the analysis covers 2000–2026; the annual counts shown in the Scopus results sum to 1,681. The supplied bibliometric/source export used for the remaining analyses contains 1,678 article occurrences across 749 source entries, while the thematic dataset contains 250 terms distributed across four labelled clusters. It should be noted that the difference between 1,681 screened Scopus documents and 1,678 assigned article occurrences reflects the supplied export structure and is retained rather than being artificially reconciled.

Screening process: Search query → “inventory management AND operations research”; Search within → Article Title, Abstract, Keywords; initial results → 1,681 documents; Source type → Journal (1,681); Document type → Article (1,535) + Review (146); Language → English (1,681); analytical period → 2000–2026. This sequence provides a transparent basis for defining the dataset used in the subsequent bibliometric analysis.

4.1 Publication trends over time

Figure 2 illustrates the annual publication output from 2000 to 2026, and Table 2 reports the annual counts, growth rates and cumulative output. Publication activity begins at 13 articles in 2000 and rises to 29 articles in 2001 and 2002 before reaching 48 in

2003. The middle period is characterized by fluctuations: output reaches 66 articles in 2007, falls to 33 in 2009, and then remains mostly within the 40–55 range through 2018. A stronger upward movement begins after 2018. Output increases from 61 articles in 2019 to 75 in 2020, falls temporarily to 59 in 2021, then rises sharply to 95 in 2022, 149 in 2024 and a peak of 191 in 2025. The 2026 value of 158 remains substantially above most earlier years, although the current-year figure should be interpreted cautiously.

A comparison of the two periods reveals a clear increase in the scale of research activity. Average annual output was 43.7 articles during 2000–2019, compared with 114.9 articles during 2020–2026. The largest year-on-year increase occurs in 2024, when production rises by 93.5% from the previous year. Taken together, the pattern indicates a substantial expansion of research interest in inventory control and related supply-chain topics, while also showing that growth is uneven rather than perfectly continuous.

Table -2: Annual scientific production and growth. *2026 represents the latest supplied year and may not cover a complete publication year.

Year	Documents	Annual growth (%)	Cumulative documents
2000	13	–	13
2001	29	123.1	42
2002	29	0.0	71
2003	48	65.5	119
2004	41	-14.6	160
2005	37	-9.8	197
2006	47	27.0	244
2007	66	40.4	310
2008	50	-24.2	360
2009	33	-34.0	393
2010	34	3.0	427
2011	40	17.6	467
2012	50	25.0	517
2013	47	-6.0	564
2014	51	8.5	615
2015	53	3.9	668
2016	48	-9.4	716
2017	49	2.1	765
2018	48	-2.0	813
2019	61	27.1	874
2020	75	23.0	949
2021	59	-21.3	1,008
2022	95	61.0	1,103
2023	77	-18.9	1,180
2024	149	93.5	1,329
2025	191	28.2	1,520
2026	158	-17.3	1,678

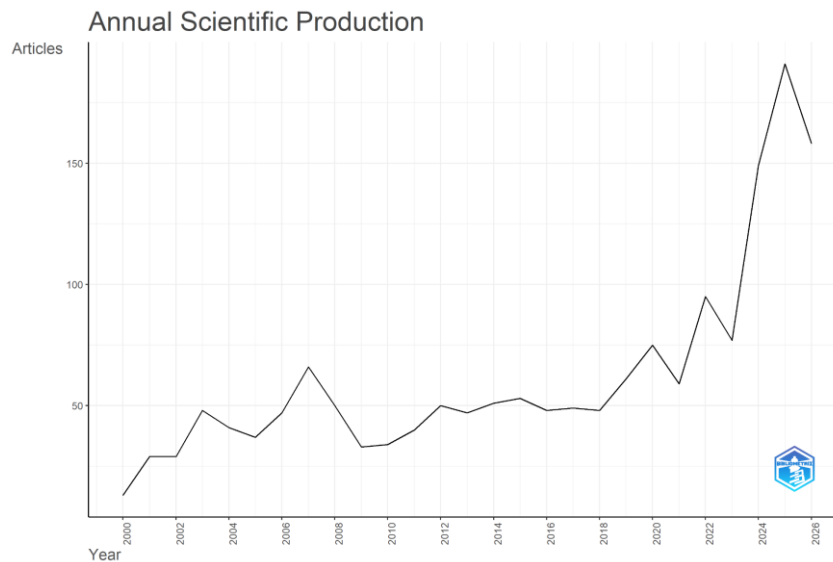


Figure -2: Annual scientific production, 2000 to 2026.

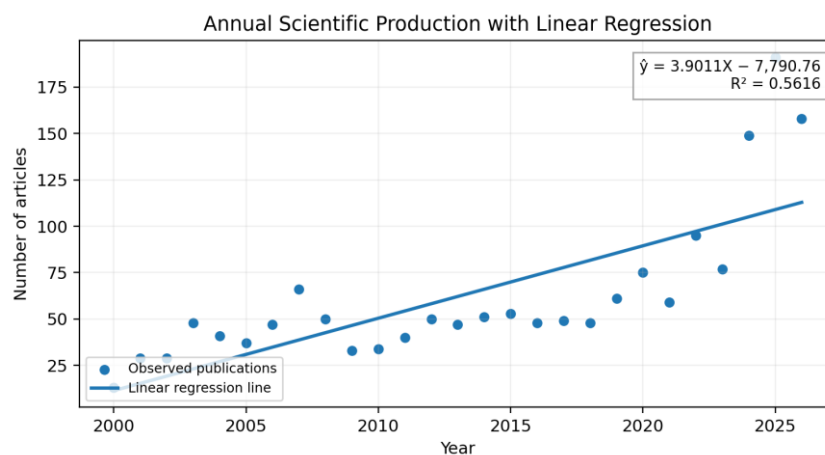


Figure -3: Annual scientific production with linear regression line, 2000–2026.

Linear regression equation (calendar year): $\hat{y} = 3.9011X - 7,790.76$; $R^2 = 0.5616$ (56.16%). The positive slope indicates an average increase of about 3.90 articles per year.

To quantify the observed trend, a linear regression line is presented separately in Figure 3. The fitted relationship makes the overall direction of publication activity explicit. Using calendar year as the independent variable, the fitted line is $\hat{y} = 3.9011X - 7,790.76$. The resulting model gives $R^2 = 0.5616$, meaning that year explains about 56.16% of the variation in annual publication output. In addition, the Pearson correlation coefficient is approximately 0.749 and the relationship is statistically significant ($p = 6.84 \times 10^{-6}$). The quadratic model improves the descriptive fit to $R^2 = 0.747$, while the cubic model reaches $R^2 = 0.887$. The exponential model has $R^2 = 0.683$ when calculated on the logarithm of the counts. It is important to emphasize that these higher nonlinear R^2 values describe the historical curve and should not be confused with the primary ordinary linear-regression R^2 .

Table -3: Trendline fits to annual production. The exponential R^2 is calculated on the logarithm of the article counts.

Model	Equation (x = 1 for 2000)	R^2 (2000–2026)	Notes
Linear	$y = 3.90x + 7.53$	0.562	Primary linear model
Logarithmic	$y = 29.84 \ln(x) - 9.21$	0.369	Descriptive fit
Exponential	$y = 23.53e^{(0.058x)}$	0.683	Descriptive fit
Polynomial (order 2)	$y = 0.322x^2 - 5.118x + 51.12$	0.747	Descriptive fit
Polynomial (order 3)	$y = 0.0412x^3 - 1.410x^2 + 14.636x + 0.89$	0.887	Descriptive fit

For the purposes of the present study, the linear result is the appropriate primary R^2 for the ordinary regression of publication year against annual article output. The higher polynomial values suggest that the series contains substantial curvature, especially because of the sharp rise after 2019. The cubic model is therefore useful for describing the observed historical pattern, but it should not be treated as a reliable forecast because only 27 annual observations are available and the latest year may be incomplete.

4.2 Most relevant sources

The source-level evidence indicates that the 1,678 article occurrences are distributed across 749 source entries. Table 4 presents the ten most relevant sources in the supplied dataset. Together, these ten sources account for 21.8% of the total article occurrences, while the remaining 739 sources account for the majority of the literature. Taken together, the distribution indicates a long tail, with a relatively small group of journals carrying a sizeable share of the publications.

Table -4: Most relevant sources (top ten sources in the supplied source dataset).

Rank	Source	Articles	Share (%)	Cumulative share (%)
1	European Journal Of Operational Research	95	5.7	5.7
2	International Journal Of Production Research	42	2.5	8.2
3	Sustainability (Switzerland)	42	2.5	10.7
4	Production And Operations Management	36	2.1	12.8
5	International Journal Of Production Economics	30	1.8	14.6
6	Journal Of The Operational Research Society	28	1.7	16.3
7	Journal Of Operations Management	26	1.5	17.8
8	Computers And Operations Research	24	1.4	19.2
9	Operations Research	23	1.4	20.6
10	Management Science	20	1.2	21.8

The results indicate that the European Journal of Operational Research is the leading source with 95 articles, more than twice the output of the next sources, the International Journal of Production Research and Sustainability (Switzerland), each with 42 and 42 articles respectively. Production and Operations Management contributes 36 articles, followed by International Journal of Production Economics with 30. The leading outlets are strongly concentrated in operations research, production, inventory and supply-chain management, which is consistent with the central themes identified in the thematic analysis.

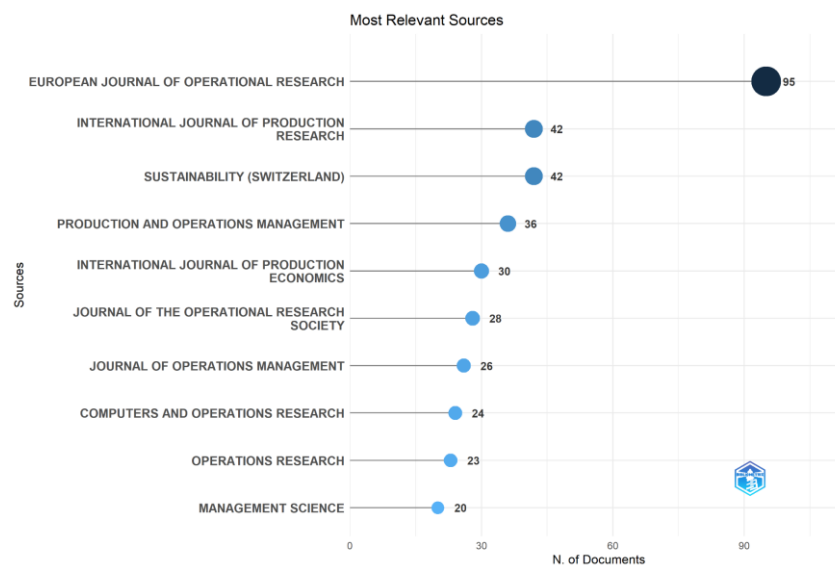


Figure -4: Most relevant sources by number of articles.

4.3 Sources' production over time

Figure 5 shows the production over time of the five leading sources. The European Journal of Operational Research remains the dominant outlet throughout the period and reaches 95 articles by 2026. International Journal of Production Research rises steadily to 42 articles, while Sustainability (Switzerland) accelerates particularly strongly in the later years and reaches 45. Production and Operations Management reaches 36, and International Journal of Production Economics reaches 30. The later acceleration of

sustainability-oriented publication activity indicates that inventory and supply-chain research is increasingly connected with environmental and sustainable-management concerns.

The source-dynamics analysis further demonstrates that the leading journals do not grow at identical rates. European Journal of Operational Research has the largest cumulative base, whereas Sustainability (Switzerland) displays a marked later-period increase. The combination of operations-research journals and sustainability-oriented outlets indicates that the field is developing across both quantitative decision-making and broader sustainability dimensions.

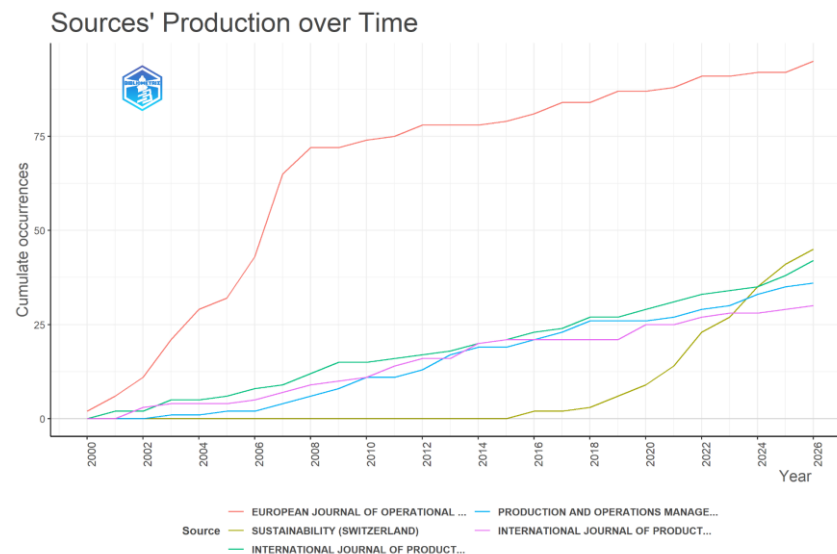


Figure -5: Cumulative production of the five leading sources, 2000 to 2026.

4.4 Country-Level Analysis

The country-level analysis provides a complementary perspective by examining the publication and source analysis by examining where research on supply chain management and inventory control is produced, how strongly that research is cited, and how the leading countries have developed over time. For this reason, the three figures should be interpreted together because publication volume, citation impact and growth trajectory measure different aspects of research contribution.

Country Scientific Production

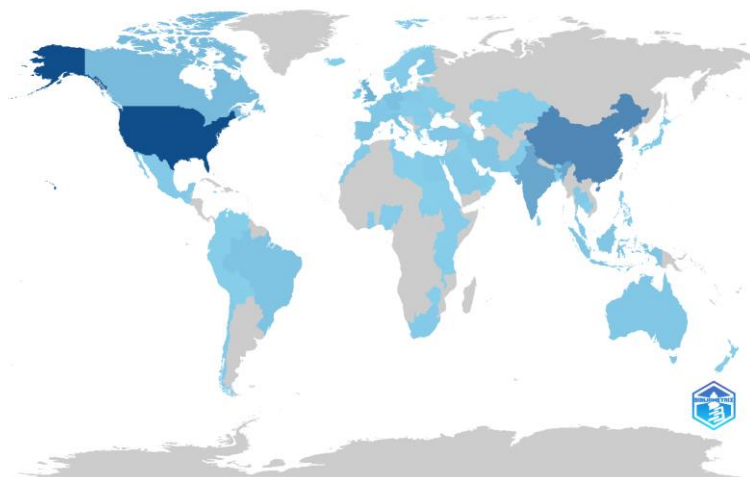


Figure -6: Country scientific production.

Figure 6 shows the geographical distribution of scientific production in the field. The strongest concentration is visible in the United States, followed by China, India, the United Kingdom and Canada. The map indicates that research activity is concentrated across North America, Europe and major Asian research economies, with additional contributions from Australia, Latin America and other regions. This broad geographical spread indicates that inventory control and supply-chain research is an international field rather than one confined to a single research system.

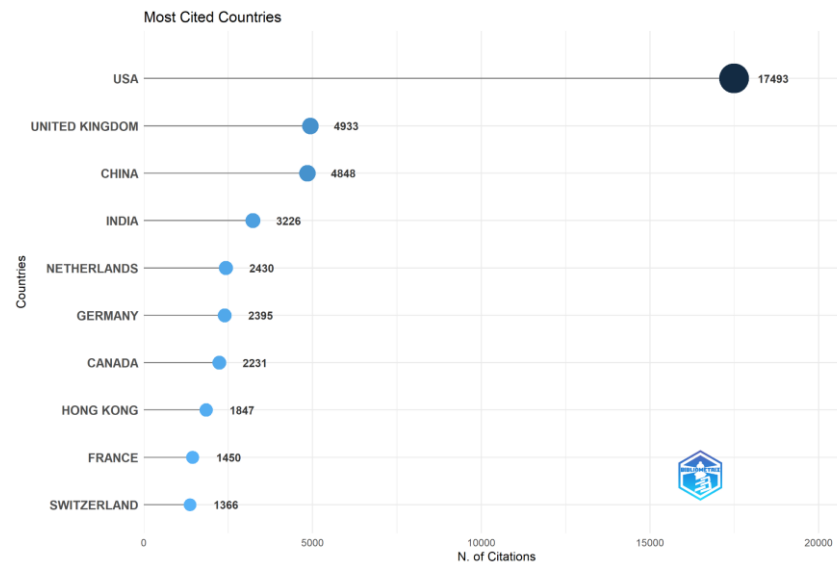


Figure -7: Most cited countries by total citations.

Figure 7 shows a clear difference between citation volume and citation intensity. The United States records 17,493 citations, far ahead of the United Kingdom (4,933) and China (4,848), followed by India (3,226), the Netherlands (2,430) and Germany (2,395). Among the ten countries displayed, the United States contributes about 30.3% of their combined 57,740 citations. Total citations, however, do not measure citation efficiency. Switzerland has the highest average article citation value in the supplied data (273.2), followed by the Netherlands (93.5), France (80.6) and the United Kingdom (70.5), while the United States records 56.2. China has a lower average of 24.0 despite its high total citation count. This contrast shows that publication volume and research impact are related but not identical: countries with fewer publications can still produce highly cited individual articles.

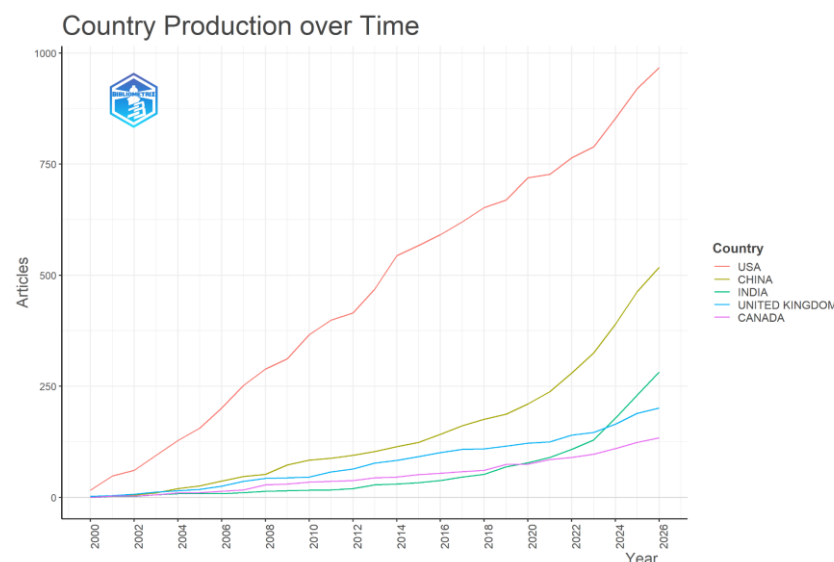


Figure -8: Country production over time, 2000–2026.

Figure 8 highlights the changing trajectories of the five leading countries. The United States remains the strongest producer throughout the period and reaches 967 articles by 2026. China follows with 518 articles and shows particularly strong acceleration in the later years. India reaches 282 articles and displays a pronounced increase after 2020, while the United Kingdom reaches 201 and shows a more gradual, sustained trajectory. Canada reaches 134 and remains comparatively smaller but steadily contributes to the literature. The sharp recent growth of China and India suggests increasing participation from Asian research systems, while the continued lead of the United States indicates persistent research depth and institutional capacity.

Taken together, the three country-level figures provide three complementary dimensions of the literature. The production map identifies geographical concentration, the citation chart highlights intellectual impact, and the time-series chart shows how leading countries have expanded their contribution. An important methodological point is that country-level publication counts can reflect international co-authorship, so they should not be added together as if each article belonged exclusively to one country. The country results therefore provide a comparative view of research participation and influence rather than a mutually exclusive allocation of the 1,681 Scopus records.

4.5 Thematic map

The thematic mapping procedure places each cluster of keywords on a two-dimensional diagram according to its relevance degree (centrality) and development degree (density). In this framework, centrality represents the strength of a cluster's links with other clusters and therefore its importance within the wider field, while density reflects the internal development and cohesion of the terms within a cluster. Clusters in the upper right quadrant are motor themes, upper left are niche themes, lower right are basic themes, and lower left are emerging or declining themes.

The thematic evidence indicates that the supplied dataset contains 250 terms grouped into four labelled clusters: inventory control, supply chain management, article and sustainability. The first thematic map uses the default clustering output, while the following three maps provide alternative clustering views. Across the four maps, inventory control, supply chain management, inventory management, decision making, operations research and optimization form the central operational vocabulary. Sustainability and sustainable development occupy a more developed thematic position, while generic terms such as article, human and humans are separated from the main operational themes. The alternative maps also identify modelling and humanitarian logistics as smaller or emerging/declining themes.

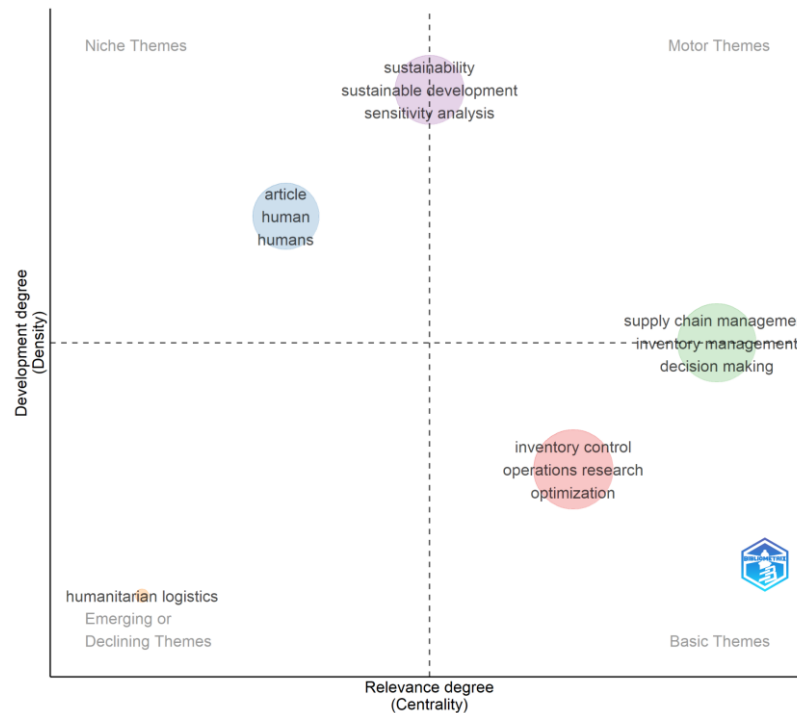


Figure -9: Thematic map, default clustering output.

Table -5: Main thematic clusters identified from the supplied thematic dataset.

Cluster	Label	Keywords	Occurrences	Leading keywords (occurrences)	Position on map
1	inventory control	63	2,678	inventory control (445); operations research (307); optimization (124)	Basic / motor boundary
2	supply chain management	95	3,032	supply chain management (374); inventory management (222); decision making (194)	Basic / motor boundary
3	article	33	953	article (134); human (112); humans (77)	Emerging / peripheral
4	sustainability	59	1,254	sustainability (73); sustainable development (62); sensitivity analysis (50)	Niche / motor boundary
	Total	250	7,917		
	Total	250	9,141		

4.6 Main themes

Of particular significance is the inventory-control cluster, which represents the inventory-control cluster. It contains 63 keywords and 2,678 total occurrences, led by inventory control (445), operations research (307), optimization (124), inventory (118) and costs (105). Taken together, these terms indicate a strong quantitative orientation in the literature, where inventory decisions are connected with optimization, mathematical models, production control and cost management. This is directly aligned with the central focus of the present analysis.

The supply chain management cluster comprises 95 keywords and 3,032 occurrences. Its leading terms are supply chain management (374), inventory management (222), decision making (194), supply chains (139) and sales (109). Its relatively high occurrence level and central position across the thematic maps indicate that inventory decisions are studied as part of broader supply-chain coordination and managerial decision-making rather than as isolated stock-control problems.

4.7 Other themes

The sustainability cluster comprises 59 keywords and 1,254 occurrences. Its leading terms include sustainability (73), sustainable development (62), sensitivity analysis (50), environmental impact (44) and environmental management (44). In the thematic maps, sustainability and sustainable development appear in the upper portion of the diagrams, indicating a relatively developed thematic area that is connected to, but distinguishable from, the main inventory and operations themes.

By contrast, the article cluster contains 33 keywords and 953 occurrences, with article, human and humans among its leading terms. These are generic indexing terms rather than substantive inventory-control concepts, so they should not be interpreted as a major research theme. The maps also show smaller terms such as modelling and humanitarian logistics in the emerging or declining region, suggesting specialized applications that are less central to the overall conceptual structure.

The positions of the smaller clusters warrant cautious interpretation. A position in the emerging or declining quadrant does not by itself establish whether a theme is increasing or decreasing. The thematic map is primarily a structural representation of centrality and density, so temporal evidence would be required before describing a theme definitively as emerging or declining.

4.8 Comparison across clustering algorithms

Table 6 compares the four thematic maps. The maps share a clear operational core: inventory control, supply chain management, operations research, inventory management and decision making remain close to the central/right-hand side of the diagrams. Sustainability and sustainable development remain visually distinct in the upper region. The generic article/human terms are separated from the main operational cluster. These recurring patterns suggest that the broad conceptual structure is reasonably stable even when the clustering method changes.

The principal differences between the maps concern the smaller themes and their exact quadrant positions. In some maps, inventory control and operations research form a distinct basic cluster, while in others they are positioned closer to supply chain management. Sustainability remains highly developed but changes slightly in its position relative to the centrality boundary. Modelling and humanitarian logistics appear as smaller peripheral themes. These differences underscore why individual quadrant labels should be interpreted as structural descriptions rather than definitive statements about the future direction of a research topic.



Figure -10: Thematic map, alternative clustering output 1.

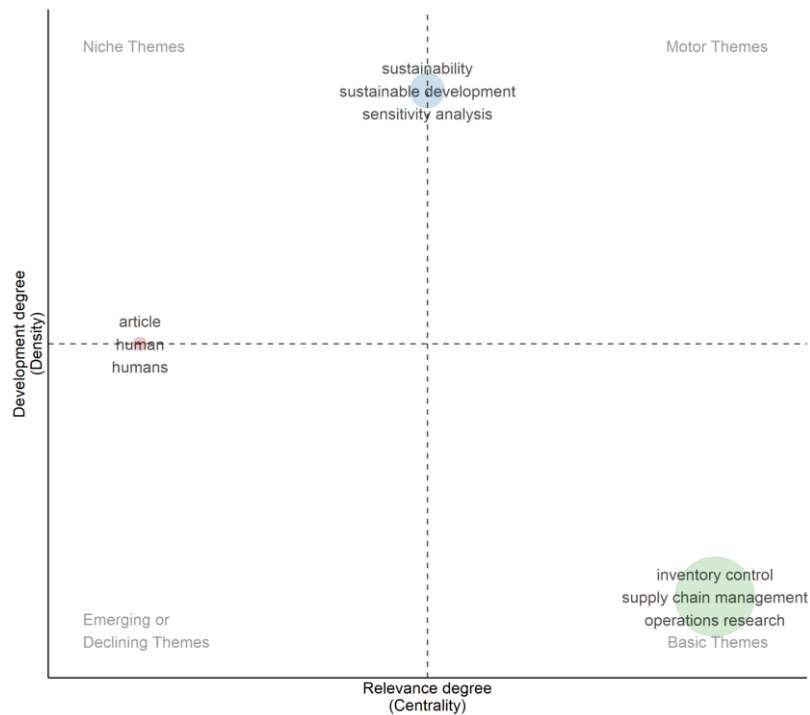


Figure -11: Thematic map, alternative clustering output 2.

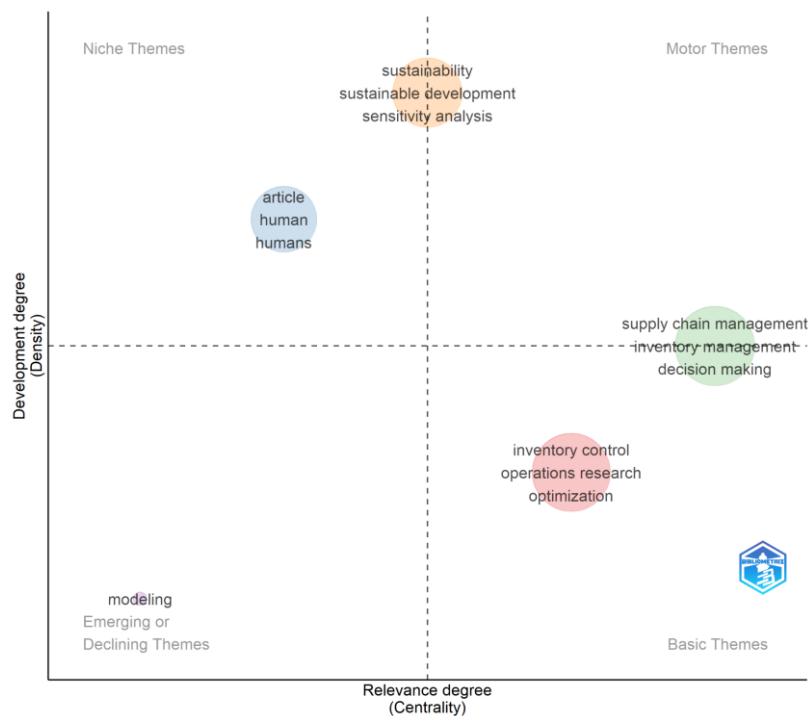


Figure -12: Thematic map, alternative clustering output 3.

Table -6: Position of the main themes in the four thematic maps. Positions were read from the supplied maps; the figures provide the visual basis for the comparison.

Theme	Louvain (Figure 9)	Leading eigenvector (Figure 10)	Walktrap (Figure 11)	Spinglass (Figure 12)
Supply chain management, inventory management, decision making	Basic / central	Basic / central	Basic / central	Basic / central
Inventory control, operations research, optimization	Basic / central	Basic	Basic	Basic / central
Sustainability, sustainable development	Niche / motor boundary	Niche / motor boundary	Niche / boundary	Niche / motor boundary

Theme	Louvain (Figure 9)	Leading eigenvector (Figure 10)	Walktrap (Figure 11)	Spinglass (Figure 12)
Article, human, humans	Niche / peripheral	Emerging / declining	Emerging / declining	Niche / peripheral
Modelling / humanitarian logistics	Emerging / declining	Peripheral	Not among leading terms	Emerging / declining

4.9 Conceptual structure (factorial analysis)

To provide a complementary perspective, factorial analysis was used to examine the conceptual structure of the keywords from a second angle. Multiple correspondence analysis (MCA) reduces keyword relationships to two dimensions, so terms that tend to occur in similar conceptual settings are plotted close together. The supplied factorial map indicates that 54.87% of the variation on Dimension 1 and 18.22% on Dimension 2, so the first two dimensions together account for 73.09% of the displayed structure.

A notable feature of Figure 13 is the concentration of operational terms around inventory control, operations research, optimization, inventory management, supply chain management, scheduling, resource allocation, mathematical models and problem solving. Artificial intelligence and machine learning appear closer to the broader operational structure, while sustainability, environmental management, environmental impact and life-cycle terms form a more distinct lower-left grouping. The map therefore suggests a conceptual separation between quantitative operational decision-making and sustainability-oriented concerns, while still showing connections between them.

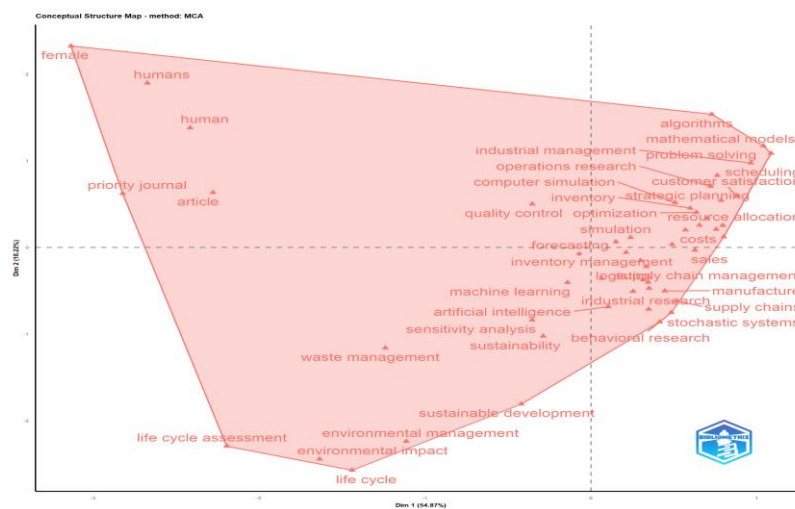


Figure -13: Conceptual structure map, MCA method (Dim 1 = 54.87%, Dim 2 = 18.22%).

The dendrogram provides a complementary representation of a complementary view of the keyword relationships. Closely connected terms form smaller branches around inventory control, supply chain management, inventory management, decision making, operations research, optimization, scheduling and resource allocation. Sustainability-related terms such as sustainable development, environmental management, environmental impact and life-cycle assessment form another recognisable group. Overall, the clustering evidence supports the interpretation that the field has a strong operational core alongside a distinct sustainability dimension.

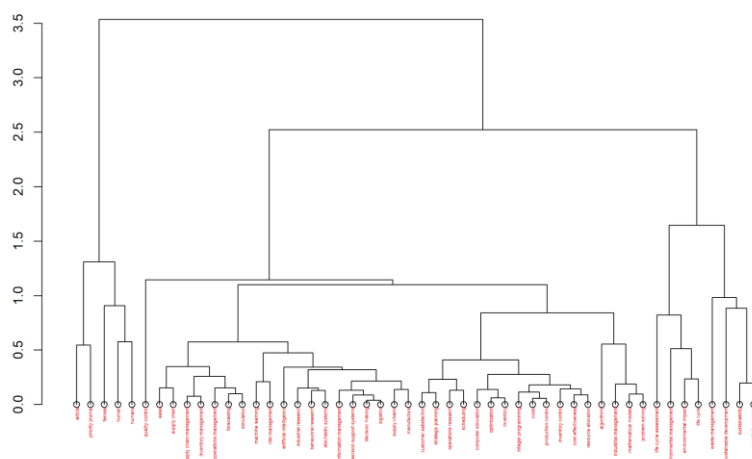


Figure -14: Topic dendrogram of the keywords.

A note of caution is nevertheless warranted because the factorial map represents a reduced two-dimensional view of the keyword space. Distances on the map should therefore be interpreted as conceptual proximity rather than direct evidence of causality. Generic terms such as article and human also appear in the supplied keyword set and can influence the visual structure, so the map should be read together with the occurrence and cluster information.

4.10 Findings

(1) The findings indicate that research output increased from 13 articles in 2000 to a peak of 191 in 2025, with 158 articles recorded in 2026. Average annual output increased from 43.7 articles in 2000–2019 to 114.9 in 2020–2026.

(2) The standard linear regression gives $\hat{y} = 3.9011X - 7,790.76$, $R^2 = 0.5616$ (56.16%), Pearson $r \approx 0.749$ and $p = 6.84 \times 10^{-6}$. The quadratic and cubic descriptive fits improve to $R^2 = 0.7467$ and 0.8871 , respectively, but these nonlinear values should not be confused with the primary linear-regression R^2 .

(3) The source analysis indicates that the European Journal of Operational Research is the leading source with 95 articles. The ten leading sources account for 21.8% of the article occurrences, suggesting that the literature is distributed across a long tail of additional sources.

(4) The thematic findings indicate that inventory control and supply chain management form the central research structure. Operations research, optimization, inventory management and decision making provide the principal quantitative and managerial vocabulary of the field.

(5) The thematic evidence further suggests that sustainability and sustainable development constitute a distinct and developed dimension, while smaller themes such as modelling and humanitarian logistics occupy peripheral positions. The precise quadrant occupied by these smaller themes varies across clustering approaches.

(6) The factorial analysis indicates that 73.09% of the displayed two-dimensional structure is explained by the first two dimensions (54.87% on Dimension 1 and 18.22% on Dimension 2). The results suggest that operational terms cluster around inventory and supply-chain decision-making, whereas sustainability and environmental terms form a more distinct conceptual grouping.

Limitations of this section. The present analysis is based on the supplied bibliometric datasets and visual outputs, so accordingly, the conclusions are limited to the coverage and keyword construction of those data. The thematic quadrants are interpreted from the supplied maps rather than from exported centrality and density statistics. Generic indexing terms are present in the keyword data, and the 2026 annual count may represent an incomplete current-year observation.

5. FUTURE RESEARCH AGENDA

As follows from the bibliometric results, the research of inventory control and operations research has greatly evolved. In the presented database, the number of annual publications grew from 13 in 2000 to 191 in 2025, with 158 in 2026 being likely an incomplete year. The thematic maps show that the topics of inventory control, supply chain management, operations research, optimization and decision-making have occupied central positions in this scientific field. The sustainability is one of the themes that have been successfully formed, and the machine learning and artificial intelligence are increasingly becoming closer to the area of operational decision-making. This implies that not only new models should be developed in the future, but also their connection with the inventory control and the related decisions and impacts should be shown. The following directions are recommended from the presented bibliometric analysis and the selected literature on Scopus export. The clusters of keywords and publications show general areas of development rather than the absence of a specific topic in the whole literature.

5.1 Integrating Machine Learning with Operations Research

Conceptual architecture puts artificial intelligence and machine learning near the wider operational cluster, and inventory control, optimization, and operations research still lie at the core. Thus, we have good grounds to conduct research on how predictive models can be linked to prescriptive solutions. Machine learning can forecast demand, delivery time or shortage probability, and operations research models can make decisions based on these predictions about order quantities, safety stock, and when to order. New studies analyze neural networks' application in supply chains (Ghalekhondabi, 2026), and Huq et al. (2026) explore machine learning and explainable AI in supply chain decision support systems. All these trends show that there is a need for the models combining both elements of the problem instead of pursuing only forecasting precision.

Future research can examine the relative performances of forecasting and optimization models against ML-OR methods based on common data sets and realistic costs. This can be done by evaluating the performance of both methods according to total inventory cost, service level, shortages, surplus and recommendation stability in response to changing demand. An additional factor worth considering is that of explainability; an algorithm that is right but does not explain itself in making its decision can be hard for a manager to accept.

5.2 Adaptive Inventory Control under Uncertainty

Inventory management and operations research represent some of the most prominent topics in the thematic analysis provided above. They are associated with optimization, cost considerations, mathematical models, and decision making by the keyword structure. Nevertheless, there is demand uncertainty, variability of lead times, supply disruptions, and changes in the level of customer service in inventory management. It is possible that one single policy will not be effective under all these circumstances. Contextual distributionally robust optimization for inventory replenishment in the presence of demand uncertainty is an active area of research (Wang et al., 2026). An artificial intelligence-supported approach to inventory management is presented in Preil and Krapp (2022).

Future research could examine stochastic programming, robust optimization, simulation and learning approaches based on the same operating conditions. Instead of testing the models solely for average demand, the future research should test these approaches using demand peaks, long lead time, limited supplier capacity and limited information. Another research question could be identifying

situations in which a more complicated adaptive approach is justified. This would allow developing guidelines as to which approach is appropriate for different inventory situations, ranging from expensive spare parts to retail items.

5.3 Sustainable and Circular Inventory Systems

The areas of sustainability and sustainable development are clearly defined and constitute a somewhat advanced theme in the provided maps. These include environmental impact, environmental management, and sensitivity analysis. In being separated from the main operational theme, this indicates that there could be possibilities for a linkage between environmental concerns and inventory decisions in day-to-day operations. Traditionally, costs and services have been the primary concerns in most of the models, but the decisions made on inventory can have impacts on emissions, product waste, return policies, reuse, and disposal. García-Alvarado et al. (2017) discuss issues of inventory management and product recovery and cap and trade systems.

Further research efforts must be directed toward the development of multi-criteria models that integrate both economic objectives such as inventory cost and service level together with non-economic criteria such as carbon dioxide emissions and waste management. For instance, such models might study a trade-off between, for instance, higher order quantities that would decrease transportation frequency but result in increased costs of holding inventory or between reduced waste through recovery and remanufacturing on the one hand and increased uncertainty about recovered products on the other hand. In addition, comparative research might show how environmentally sustainable approaches can work versus purely economic ones.

5.4 Integrated and Resilient End-to-End Supply Chains

Supply chain management is one of the biggest clusters in thematic analysis and is associated with inventory management, decision making, and sales. It means that there is an understanding of inventory management as an integral system, not just stock management. Decisions related to procurement, manufacturing, replenishment, and delivery are interdependent. For instance, procurement from cheap suppliers can be accompanied by longer lead time or less reliability. Another case when decisions are interconnected is when a shorter distance in the transport strategy requires other replenishment levels. Sadeghi et al. (2025) investigate a procurement and inventory model with flexible manufacturing in sustainable supply chains.

Further research might focus on integrated models for supplier selection, production planning, inventory placement, and vehicle routing that account for disruptions like supplier default, transportation delay, and sudden shifts in demand. Researchers might then compare an integrated approach to the more traditional sequential approach to see at what point there is a true benefit from coordination. Another good avenue would be to study the resilience of various inventory strategies, looking not just at their operating cost but also factors such as recovery time, shortage duration, unfulfilled demand, and service level. Scenario analysis and simulation might help managers get a feel for the amount of buffer stock needed depending on the level of risk.

5.5 Digital Data and Real-Time Inventory Decision Support

Artificial intelligence and machine learning appear close to the operational language as per the given conceptual map but the core of the subject area lies in inventory control, optimization, and decision making. This leads to scope for understanding the ways in which digital information could facilitate inventory decision making in terms of relevance and quality. Information from point of sale systems, warehouses, suppliers and logistics can give a more up-to-date picture of the situation. Tan et al. (2024) have studied inventory management from the viewpoint of a “cloud supply chain” with a data-driven approach. However, having information available does not necessarily mean good decision making – it may be late, conflicting or even incomplete.

Future studies could look at what sources of information provide the highest level of added value and how frequently the strategies of inventory management must be reviewed. For example, one could compare periodic planning to rolling or event-based replenishment plans and explore the impact of the quality of information on the incidence of shortages and surpluses of inventory. It will also be useful to study implementation issues, including costs, the integration of the system, training of employees, and the explainability of automatic decisions.

5.6 Validation, Human Factors and Research Design

Despite giving us an overview of the development of publications and conceptual connections, the bibliometric approach in its own right cannot prove whether the model that we want to use is workable in practice. The database used consists of 1,681 Scopus records that were filtered out, while the provided file has 1,678 article occurrences. The number of publications is stated to be 2026, yet it can be understated. It is for these reasons that there is a necessity for reproducible and empirical studies combined with modelling.

In future research, model validation should include real-world data on system operation, out-of-sample tests, and comparisons with current approaches. When real-world data is not available, assumptions used by the researchers should be clearly stated and sensitivity tests conducted to see how changing cost parameters, demand variability, or lead time affects the results. Another idea worth pursuing is a field study of how managers react to algorithmic suggestions, how and why they deviate from the recommendations. Finally, cross-sector and cross-country comparisons may be done to see whether lessons learned from one inventory management system are applicable in another.

In conclusion, the next step in research related to the use of operations research in inventory management must integrate aspects of prediction, optimization, and execution. The findings from the bibliometric analysis highlight that there is a robust quantitative core, a sustainable component, and an increasing association with artificial intelligence-based decision-making systems. Future studies must focus on comparing these approaches under similar circumstances to demonstrate their impacts on costs, service, resilience, and sustainability.

6. CONCLUSION

This study set out to examine how Operations Research methodologies and quantitative decision-making tools have been applied to inventory management, and to trace how this research area has developed over time. To meet this objective, the authors built a

bibliometric database using Boolean searches that combined Operations Research and Operations Management terminology with Inventory Management, Inventory Control and Inventory Optimisation keywords over the period 1990–2026, following a structured Identification, Screening, Eligibility and Inclusion process. The combined search returned 709 documents, which were reduced to 698 unique articles after duplicate removal. After further cleaning to remove records with incomplete metadata, the final dataset used for the bibliometric analysis contains 622 records, spanning publication years from 1990 to 2026. The conclusions below are drawn from this 622-record dataset.

The publication-trend analysis addresses the first part of the research objective by confirming that inventory management, viewed through an OR lens, is a well-established and steadily expanding field. Output was minimal before the 1990s but grew consistently from 2000 onward, with 517 records (83.1% of the dataset) published from that year forward, and annual output reaching a peak of 45 articles in both 2024 and 2025. An exponential trendline ($R^2 = 0.8788$) describes this growth better than a linear one ($R^2 = 0.7262$), pointing to an accelerating rather than a steady rate of expansion. That said, year-to-year fluctuations and the incomplete 2026 figures mean that this pattern should be read as a description of past growth rather than a guaranteed forecast.

The source and author analyses speak to who is producing this research and where it is being published. Output is concentrated in a small core of established journals, led by the European Journal of Operational Research, Production and Operations Management, and the International Journal of Production Economics, and Bradford's Law confirms this concentration by showing that around 30 journals form the field's core zone. At the author level, WANG X, LI Y and WANG Y are the most prolific contributors, though the gap between the leading authors is fairly narrow, and Lotka's Law shows that roughly 90% of authors have published only a single paper in this space. Read together, these results describe a field with a broad, loosely connected base of occasional contributors alongside a smaller, recurring core of active researchers and journals.

The keyword, thematic-map and network analyses go furthest toward answering the study's central question of how OR has actually been used to solve inventory problems. Inventory management is the dominant concept both by frequency and by network centrality, functioning as the structural bridge that connects inventory control, optimisation, supply chain management and simulation. Inventory control and operations research emerge as well-developed "motor themes" at the centre of the field, while inventory management itself, along with inventory and optimisation, form the broader "basic themes" that underpin it. This is broadly similar to what Mahajan et al. (2024) found in their review, where inventory-related keywords were also the most central part of the network. The trend-topic and thematic-evolution results add a time dimension to this picture: a traditional core built around inventory, simulation and stochastic-demand modelling has, since roughly 2015, broadened toward supply-chain integration, and more recently toward technology-oriented themes such as Industry 4.0, machine learning, sustainability and deep reinforcement learning. This suggests that the field is developing through integration rather than replacement, with newer digital and sustainability-driven themes building on its established inventory-and-operations foundation rather than displacing it.

These findings carry implications across several audiences. Academically, the study contributes a structured, up-to-date map of how OR techniques have been applied across the inventory management literature, an area that, much like the parallel case of OR in insurance (Saxena et al., 2024), has not received a great deal of dedicated bibliometric attention. Managerially, the synthesis gives practitioners a clearer sense of which journals and methods to draw on when tackling inventory problems, from established control models to newer optimisation and machine-learning-based approaches, helping firms balance stockholding costs against product availability. Socially, well-designed OR-informed inventory systems have a direct bearing on the affordability and availability of goods, particularly in sectors such as food and pharmaceuticals, where stock-outs and overstocking carry real costs. From a policy perspective, the growing visibility of sustainability and technology-related themes suggests that inventory-focused OR research is becoming increasingly relevant to the circular-economy and digitalisation agendas that regulators and industry bodies are likely to draw on going forward.

The study also has some limitations. Like any bibliometric review, its findings depend heavily on the keyword sets and Boolean logic used to build the search string, so there may be studies on inventory-related OR problems that used different terms and were not captured. The authors also had limited time and technical expertise, so some of the more complex visualisations, such as the network and thematic-evolution maps, could not be explored in as much depth as they deserved. In addition, since 2026 is not yet a complete year in the dataset, the most recent trends should be taken as provisional rather than final.

Looking ahead, the sharp rise in OR-based inventory optimisation research since 2020 would be worth examining more closely, to establish whether it reflects a genuine and lasting response to pandemic-era supply-chain disruption, echoing a similar observation made about COVID-19-related coverage in the review of OR in insurance by Saxena et al. (2024). Future work could also track how quickly sustainability, Industry 4.0 and machine-learning themes move from the periphery of the field toward its established core, and whether they represent a lasting shift in the discipline or a shorter-term wave of interest.

Ultimately, inventory management will remain a problem every operating business must solve, and Operations Research will remain one of its most powerful tools for solving it well. This study offers a structured, evidence-based account of how that relationship has evolved so far, built on a dataset that traces the field from its early, scattered beginnings to its current position as an active, technologically engaged and increasingly sustainability-conscious area of research.

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