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## IRAN IN GLOBAL TRADE AND SANCTION RESEARCH: A BIBLIOMETRIC ANALYSIS (2002–2026)

**Annotation.** The article aims to conduct a bibliometric analysis of global research on Iran's trade and sanctions between 2002 and 2026. The field has developed from its initial status as a specialized subject into interdisciplinary discipline which now belongs to international economics and global governance. The research presents its originality through creating the first complete bibliometric analysis of Iran sanctions and trade research which reveals organizational connections and dominant research centers and evolving subject areas. The research investigates publication patterns and identifies leading authors and countries while developing visual models to show author teamwork and keyword connections. The research draws its data from 919 Web of Science Core Collection records. The authors used VOSviewer to analyze co-authorship and co-occurrence and citation networks which showed the intellectual and geographical structure of the field. The research on sanctions has moved past economic studies to include investigations into public health and environmental and sustainability issues. Iran has become both the empirical and intellectual center of this scholarship while strengthening ties with Europe and Asia. The research establishes sanctions research as a new framework to analyze how economic restrictions affect resilience and global justice and sustainable development.

**Keywords:** Iran, sanctions, global trade, bibliometric analysis, sustainable development.

### Introduction

The study of Iran's participation in global trade and impact of international sanctions represents a crucial area of inquiry within international economics and political economy. The United States, European Union and United Nations have imposed trade restrictions and financial sanctions on Iran during the last thirty years. The implemented measures have reshaped the country's export-import operations which in turn modified its international trade connections and altered the complete structure of Middle Eastern and global trading systems. Given the central role of Iran in energy exports and regional connectivity, examining how the sanctions regime affects its trade patterns is of growing academic and policy relevance.

Research evidence shows that economic sanctions imposed on Iran have produced multiple unanticipated effects in global trading operations. The research by Popova and Rasoulinezhad (2016) showed that sanctions cut EU-Iran trade volume in half while Asian economies experienced an 85% growth in trade with Iran thus leading to a "de-Europeanization" of its trade network. Ghodsi (2022) confirmed that general sanctions imposed by the European Union had a stronger negative impact on bilateral trade than targeted sanctions. The research by Haidar (2014) showed that sanctions resulted in major trade diversion because they required exporters to redirect their exports to markets outside of Western countries. The research by Heydarian et al. (2023) demonstrated that sanctions blocked the transportation of essential products which manufacturing facilities required. The study by Massol et al. (2024) confirmed that sanctions blocked essential production materials and capital equipment from entering the country. The research by Taleghani (2025) established that Iran faced problems with its global commodity market participation because

of methanol export sanctions and Taleghani (2025) found that Iran's oil supply chains suffered long-term damage.

Businesses have developed adaptive and resilient strategies because of sanctions that both individual firms and entire markets have had to implement. Cheratian et al. (2022) shows that Iran's export structure has become more diversified because of sanctions but this diversification has resulted in lower efficiency levels. The research by Kuznar (2024) has confirmed the diversification of the country's economic sector. Laudati and Pesaran (2023) highlighted how media coverage and expectations have amplified the economic effects of sanctions, reflecting the interaction between market sentiment and policy shocks. The last part demonstrates how sanctions have redirected Iran's trade activities toward its neighboring countries and unofficial trade routes which now serve as its primary economic connections.

Despite this substantial body of empirical research, no bibliometric study has yet systematized or visualized how scholarship on Iran's trade and sanctions has evolved over time. Previous bibliometric studies about Iran have studied different fields including health sciences (Poreau, 2017) and transport infrastructure (Azmi et al., 2024) - but none has addressed the interlinkage between sanctions, trade, and economic integration. Thus, the present study fills a clear analytical and methodological gap by providing a comprehensive bibliometric analysis of global research on Iran's trade and sanctions from 2002 to 2026.

The research has four primary objectives which include (a) tracking academic output development through time and (b) revealing leading authors and institutions and nations that advance the field and (c) displaying co-authorship relationships and (d) determining leading research subjects and new developments in the field. The research consolidation in the analysis provides scientific value to scholars and policymakers who focus on trade policy and international sanctions and regional economic resilience.

### Materials and Methods

The research uses bibliometric analysis to track worldwide studies about Iranian trade and sanctions through quantitative data and network visualization from 2002 to 2026. The Web of Science Core Collection database served as a bibliometric record source because it contains complete standardized metadata. The first search query used the Topic field (TS) to search titles and abstracts and author keywords with the Boolean string  $TS = (\text{Iran AND (Trade OR Export OR Import OR Sanction*)})$ . The search produced 3,602 results which span across different academic fields. The manual review showed that multiple records lacked evidence of any international trade or sanctions operations involvement. To improve precision, the search was refined to the Title field (TI) using the expression  $TI = ((\text{Iran OR Iranian}) \text{ AND (Trade OR Export OR Import OR Sanction OR Embargo*)})$ . The refined dataset which researchers obtained on September 27 2025 contained 956 records.

The researchers used a screening process to evaluate all titles and abstracts for their connection to the study. The research team used ChatGPT-assisted filtering and manual verification to eliminate 35 duplicate articles and 2 articles that were not relevant to the study which resulted in 919 unique publications. Each document was classified into four relevance categories based on its connection to Iran's trade or sanctions: 404 highly relevant, 130 moderately relevant, 422 low-relevance. The system proved to be correct in 100 randomly selected records. The bibliographic metadata contains author names and institutional affiliations and publication years and keywords and other relevant information. were then exported and cleaned in Microsoft Excel. The data cleaning process required several operations to achieve uniform institutional names and eliminate duplicate entries and transform "economic sanctions" into "sanctions" and "model" and "analysis" into detailed terms.

The cleaned dataset was imported into VOSviewer v1.6.20 for science mapping. The analysis of co-authorship and co-occurrence and citation networks used association-strength normalization as its method. The country-level co-authorship network required at least five documents per nation for analysis which resulted in 24 countries that formed six distinct clusters.

The author-level co-authorship analysis required authors to have at least three publications each for inclusion; 61 authors fulfilled this requirement and 26 of them joined four main collaborative groups.

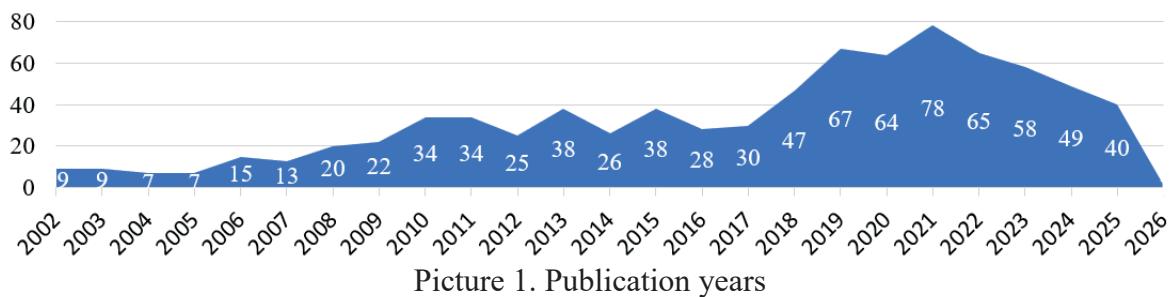
The keyword co-occurrence network with a threshold of nine occurrences found 3,488 unique keywords which organized into five thematic clusters through 35 key terms.

The researchers used Excel to create visualizations that presented publication patterns and citation metrics and author and institutional and country-based contributions. The research team conducted fractional counting for co-authorship and keyword networks to avoid duplicate counts yet they used full counting for both national and institutional statistics. The multi-step process resulted in 919 articles that provided a solid base to study Iran's trade and sanctions research through visual and quantitative methods across 35 years.

## Discussion

### 1. Evolution and Composition of Research Output (2002–2026)

The academic field of bibliometric research on Iran's trade and sanctions developed from 2002 to 2026 into a systematic multidisciplinary discipline which elevated this peripheral subject (Picture 1). Scientists published fewer than 15 papers annually during the first period which ran from 2002 to 2008 thus resulting in low research output. The limited availability of data stemmed from two factors: the newness of sanctions as an academic field and the restricted Iranian trade data access during the late reformist period. The research of Popova and Rasoulinezhad (2016) encountered two main obstacles because of political limitations and the fragmented nature of Iranian statistical information. The initial research focused on descriptive and policy-based approaches instead of econometric methods because it studied sanctions through diplomatic and qualitative economic viewpoints.



A turning point emerged after 2009, coinciding with the escalation of multilateral sanctions linked to Iran's nuclear program and the 2010 United Nations Security Council Resolution 1929. The number of annual publications increased dramatically from 20 in 2008 to 34 during 2010–2011 because researchers started using quantitative economic models instead of their previous reliance on geopolitical qualitative analysis. Research now focuses on macroeconomic indicators which include oil exports and inflation rates and exchange rates (Haidar, 2013; Shirazi, 2016; Farzanegan, 2019) because of improved international trade database availability. The 2013–2016-time span showed unstable trends because of the unclear status of the Joint Comprehensive Plan of Action (JCPOA) diplomatic talks. The number of publications between 26 and 38 per year demonstrated how people alternated between positive and negative views about Iran's return to international trade. The research methods used in this period became more diverse because scientists applied gravity models

and computable general equilibrium frameworks and trade reorientation analyses to study Iran's Asian orientation (Popova & Rasoulinezhad, 2016; Shirazi, 2016; Massol et al. 2023). The research by Popova and Rasoulinezhad (2016) demonstrated through econometric methods that sanctions imposed on Iran decreased its trade activities while forcing the country to shift its exports toward Asian markets.

The field developed through its expansion phase from 2017 until 2021. The production numbers began at 30 units in 2017 before reaching their highest point of 78 units during 2021 which represented a 160% increase from 2017 to 2021. The following factors explain the recent increase in research about sanctions: Trump administration's 2018 sanctions renewal brought back academic interest in their economic and humanitarian effects (Cheratian et al. 2022). The research benefited from three key developments during 2022: the expansion of open-access trade and policy databases (WITS, IMF-DOTS) which provided more detailed empirical studies and COVID-19 pandemic which brought together researchers from different fields to study medical import analysis and healthcare system stability and crisis response (Ebrahimi et al. 2024).

The number of published records decreased after 2022 when researchers produced 65 records in 2022 but only 40 records in 2025 and one provisional record in 2026. The observed decrease in publications does not indicate decreasing interest because many 2024–2025 papers continue to appear as “Early Access” in bibliometric databases. The decline represents the main theme of the story which has become more defined. Academic researchers now dedicate their efforts to enhancing sanction effectiveness models and sectoral adaptation theories rather than discovering new subjects which indicates their progress toward theoretical maturity (Kuznar, 2024; Laudati & Pesaran, 2023). The research path followed Iran's geopolitical developments since 2010 when sanctions increased then decreased in 2015 before rising again in 2018 and creating humanitarian crises from 2020 to 2021.

The collection demonstrates development through various document types. The 919 total records show that peer-reviewed journal articles make up 73% of the entries with 668 entries. The field of economics policy briefs and regional studies has developed into a complete academic discipline. The second-largest formats—proceeding papers (53), editorial materials (50), and book chapters (41)—demonstrate the interdisciplinary and policy-oriented characteristics of the field. The researchers reached their peak publication output during two essential political events which spanned from 2013 to 2016 during JCPOA negotiations and from 2018 to 2021 when sanctions were re-imposed.

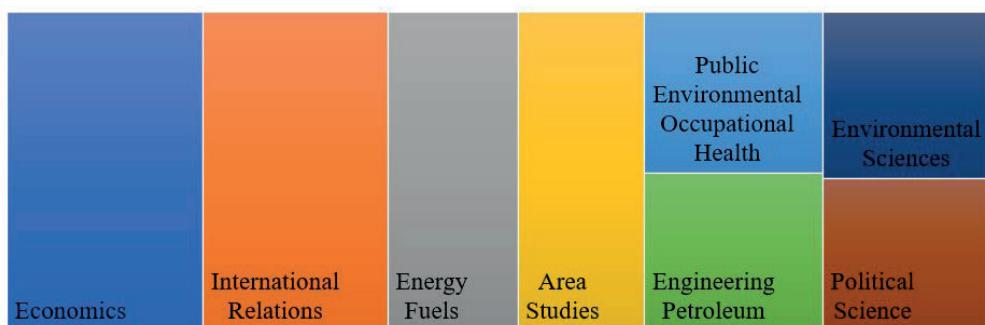
Review articles (26) started to appear in the early 2020s as evidence of growing maturity in the field. The study by Ghodsi (2022) demonstrated the implementation of meta-analytical methods. The three smallest categories consisting of letters (34) news items (33) and meeting abstracts (30) show sanctions discourse reaches outside academia to involve journalists, policymakers and practitioners during humanitarian crises (Ebrahimi et al. 2024; Cheratian et al., 2022). Even the 21 book reviews and 30 “other” categories contribute to the historiographical framing of Iran's international role, particularly through journals such as Middle East Policy and Third World Quarterly.

The time-based and organizational development of publication output indicates that sanctions research has achieved institutional maturity while broadening its interdisciplinary approach. Research output depends on geopolitical tension levels because researchers must dedicate their time to editorial work and conference activities when tensions rise but they can create systematic reviews and methodologically strong journal articles during periods of stability.

## *2. Disciplinary and Thematic Landscape*

Research on Iran's trade and sanctions has evolved from a single economic focus into a diverse field which includes health, environmental and energy and governance aspects (Picture 2).

Analysis of the Web of Science subject categories reveals that the dominant domains are Economics (104 records) and International Relations (98)—together accounting for nearly one quarter of all publications. The field established its foundation through these prominent works which demonstrated its initial focus on economic modeling and diplomatic analysis for studying trade reorientation and sanction effectiveness and global integration. Haidar (2013) and Popova & Rasoulinezhad (2016) represent this initial stage through their research which demonstrates how Iran's export performance and its market direction toward Asia have evolved.



Picture 2. Web of Science Categories

A second tier of categories—Energy Fuels (69) and Area Studies (67)—reflects oil historical centrality in Iran's international relations. The publications combine energy economics with geopolitical studies that have influenced Iran's negotiating position (Massol et al., 2024). The two fields of Engineering Petroleum (47) and Environmental Sciences (47) demonstrate how recent research has become more technologically focused.

The Public, Environmental, and Occupational Health category (48) stands as a modern development which focuses on humanitarian and social aspects. Research studies from 2020 onward have analyzed how sanctions affect the import of medical supplies and their impact on healthcare services and pandemic control (Ebrahimi et al. 2024). The field of health-oriented publications shows focus on worldwide welfare systems.

The four traditional social sciences of Political Science (43), Law (28), History (30) and Management (30) make significant contributions to the field. The sections show how sanctions operate as historical tools of power and as systems of governance. Historians and political scientists have examined the cyclical nature of sanctions—how they both express and perpetuate global hierarchies of control (Farzanegan, 2019). The Business (29) and Development Studies (16) fields show how private sector and development policy perspectives are merging to study Iran's adaptation through its informal economic systems and local innovations and regional trade routes.

The sanctions create effects on food security and disease control and livelihoods through their influence on agriculture and medicine which represent small categories of macroeconomic sanctions. The distribution of knowledge between various academic disciplines proves sanctions create real-world impacts on people because it shows sanctions extend their influence past traditional economic measurements.

The evaluation of Iran's ability to maintain innovation and create new trade relationships under limited conditions appears in two smaller yet important connections between Industry, Innovation and Infrastructure (66) and Partnerships for the Goals (67). The two environmental goals Life on Land (56) and Affordable and Clean Energy (55) reflect Iran's position as a major energy exporter while also dealing with environmental risks.

The integration of disciplinary clusters demonstrates that Iran trade and sanctions research has evolved beyond its original emphasis on economic efficiency and political negotiation. This field has developed into a detailed investigation which studies sustainable development in areas with

limited geopolitical boundaries. Academic progress at present stems from worldwide educational development which started in the mid-2010s by integrating economic research with health and climate and governance studies. The Iranian sanctions debate functions as a small example of how social sciences have evolved in the twenty-first century by dissolving the previous distinctions between economic study and policy-making and human well-being.

## Results

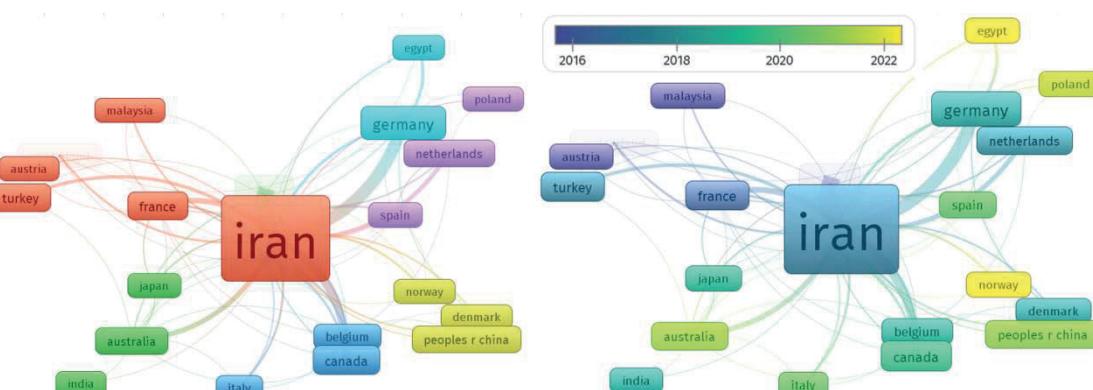
### 3. Institutional and Geographical Collaboration Patterns

Research studies about Iran's trade and sanctions activities show two main trends which include domestic research activities and increasing international research collaborations. The research field shows Iran as the leading country with 518 recorded publications which represent more than half of all available data. The research has an appropriate high presence because it examines Iran's economic system and policy framework but its size shows the academic power of Iranian scholars who work under restricted global funding and database access.

The institutional distribution pattern follows a distinct hierarchical arrangement. Islamic Azad University alone contributes 78 publications, followed by Ferdowsi University of Mashhad (29) and the Iran University of Medical Sciences (18). The Pasteur Network (15) and the Pasteur Institute of Iran (14) function as hybrid research nodes which unite biomedical and policy studies to demonstrate how sanctions receive growing analysis in terms of health security and pharmaceutical trade.

The research capabilities of the country have spread throughout the nation through the involvement of smaller institutions including Baqiyatallah University and Kharazmi University and regional medical universities. The inclusion of Amirkabir University of Technology and Gorgan University of Agricultural Sciences points to the diversification of methodological approaches—ranging from engineering and logistics to agriculture and environmental management.

Beyond Iran, a network of 24 collaborating countries has formed, as visualized through the VOSviewer co-authorship map (Picture 3). The threshold set at a minimum of five publications per country identifies six distinct clusters of international cooperation.



Picture 3. Co-authorship by countries

The cluster 1 group which focuses on Iran unites Austria with France and Malaysia and Switzerland and Turkey through their shared work in energy and agricultural and biotechnology projects between Europe and Asia. The trans-Pacific collaboration zone of Cluster 2 unites Australia with India and Japan and Sweden and the United States to work on global health and trade resilience and sanctions development. The cluster 3 group includes Belgium and Canada and England and Italy as the Western academic systems which focus on analytical and policy-oriented research about Iran. The northern Eurasian axis has emerged as a new geopolitical axis which

focuses on energy governance and sustainable transition according to Cluster 4 which includes Denmark, Norway, China and Russia since the late 2010s. The Netherlands and Poland and Spain form Cluster 5 which supports European research on sanctions impact through comparative studies and econometric modeling. The last cluster shows North-South development and health policy collaborations between Egypt and Germany.

Research collaboration expansion toward the east becomes evident through a time-based sequence which spans from 2016 to 2022. The academic networks from 2016 to 2018 were primarily made up of European institutions including France, Austria and Turkey but the networks from 2020 to 2022 show a shift toward China, India and Australia indicating Iran's academic shift toward Asia.

The United States (132 records) remains the most frequent external partner, despite political isolation, indicating that many co-authorships rely on diaspora scholars or indirect affiliations (e.g., joint doctoral supervision or temporary fellowships). England (58) and Germany (47) follow, reflecting their historical leadership in Middle Eastern and energy policy studies. The secondary group consisting of Canada (27), France (20), Turkey (17), Australia (16) and the Netherlands (16) demonstrates Western institutions that welcome collaborative work mainly for global health and energy transition purposes.

The research diplomacy of Iran extends its connections to China (12) and Italy (11) and Belgium (10) and Spain (10) which demonstrates its growing research ties with both European and Asian regions. The academic cooperation network expanded its connections with Russia and Sweden and Austria and Denmark and Egypt through smaller yet meaningful partnerships (8, 8, 7, 6, 6) which demonstrated its post-2018 shift toward multiple global centers of influence. The strategic shift of Iran toward Asia has led to new partnerships with Malaysia and India and China which unite economic and educational interests.

The collected information shows a core-periphery structure. The Iranian research community serves as the intellectual foundation which produces empirical data and contextual knowledge while Western and East Asian partners bring methodological expertise and international funding and global exposure to the project. The unequal distribution of knowledge production power between politically limited states and transnational academic networks reflects the global structure of knowledge production.

The elite Western institutions Harvard University and the Leibniz Association demonstrate that academic communication persists through professional and humanitarian networks despite current geopolitical tensions. The scientific collaboration between Iran and Germany and Canada and China shows how researchers from different political backgrounds work together on health and environmental research and sustainable development projects.

The two universities present Iran's diverse nature through their unique representation of different aspects of the country. The institutions located in Tehran handle macroeconomic and diplomatic matters but regional centers specialize in scientific fields which include health and energy and agriculture. The various fields of study involved in sanctions research in Iran function as a national unifying force which brings together economists and physicians and engineers and social scientists to study adaptation under restrictive conditions.

The system preserves stability by using institutions and geographical features while undergoing development. Academic research about sanctions continues to lead in Iran but the country develops new academic connections with Asian-Pacific and European institutions through rising participation. The research on sanctions gains enhanced empirical and theoretical depth through this transformation which positions Iran's experience as part of worldwide discussions about economic resilience and innovation and global economic inequality.

#### 4. Journals, Publishers, and Research Funding Landscape

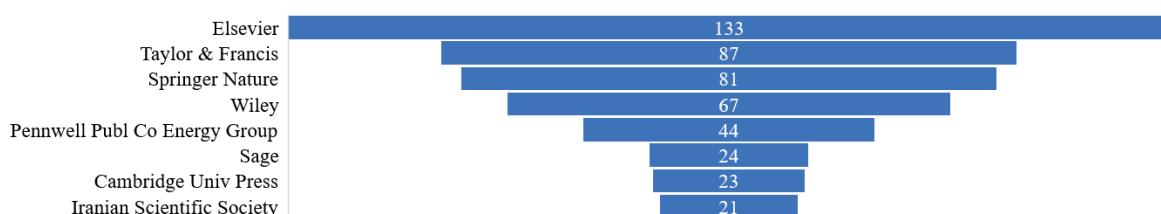
Academic research about Iran's trade and sanctions exists within a complex publication structure which shows various scholarly fields and shifting academic authority bases.

The Oil & Gas Journal appears most frequently in the corpus with 44 publications which demonstrates how energy resources remain fundamental to Iran's international relations and economic identity. The field includes two main areas of study which are Middle East Policy with 15 papers and Iranian Studies with 10 papers that focus on political and socio-historical aspects. They publish articles that study Iran's diplomatic methods and its institutional responses to sanctions and the economic effects of being isolated from the region.

The two publications Acta Horticulturae (12) and Journal of Agricultural Science and Technology (10) show how sanctions affect agricultural output and food security because these topics became more important after 2010 when U.S. and EU sanctions strengthened. The Lancet and Iranian Journal of Pharmaceutical Research and Journal of Arthropod-Borne Diseases published research that demonstrates a biomedical focus through their studies of public health emergencies and medicine import limitations and disease management problems caused by supply chain disruptions.

Nature and Science and Scientific Reports among other high-impact generalist journals demonstrate global recognition although they make up only a small fraction of the total dataset. The sanctions question has evolved into a global testing ground for science diplomacy and innovation resilience and knowledge production ethics because these countries participate in the discussion.

In terms of publishing houses, according to Picture 4, the field is dominated by global academic conglomerates. Elsevier maintains the highest number of records at 133 followed by Taylor & Francis with 87 and Springer Nature with 81 and Wiley with 67. The distribution shows Iranian research integration into global publication channels yet it reveals ongoing difficulties with international collaboration and funding support. The control of these publishers demonstrates that Iranian scholars can access traditional peer-review systems through open-access platforms and academic collaborations with diaspora scholars despite facing sanctions.



Picture 4. Publishers

PennWell Publishing stands out as an exception because its Oil & Gas Journal operates within the technical-industrial sector which shows how engineering expertise meets political economic considerations (44). The dissemination of social science research shows SAGE (24) and Cambridge University Press (23) as key nodes that focus on trade policy research which links to international relations. The Iranian Scientific Society (21) and Tarbiat Modares University Press (10) show how domestic publishing organizations operate in distinct areas between Persian and English-language publications to serve both domestic readers and global readers.

Academic institutions in Iran join forces with Western elite presses to create a hybrid publishing system which enables Iranian research to stay within domestic borders while reaching global readers through international distribution networks.

The funding system demonstrates this dual character. The two domestic institutions Golestan University of Medical Sciences and Tehran University of Medical Sciences funded 15 which demonstrated their focus on studying humanitarian effects of sanctions through biomedical

research. Shiraz University of Medical Sciences (8) follows closely, while the Iran National Science Foundation (INSF) and the NIMAD National Institute for Medical Research Development (5 each) represent Iran's strategic effort to institutionalize competitive research grants despite fiscal restrictions.

The Islamic Azad University and Tarbiat Modares University and the Pasteur Institute of Iran provided smaller funding which shows how scientific funding works through various actors when international big programs do not exist. The dataset shows evidence of restricted foreign involvement through funding from the Russian Science Foundation (3 grants) and Carnegie Corporation of New York (2 grants) and FWO Belgium (2 grants) and World Health Organization (2 grants). International cooperation continues to exist through humanitarian and scientific diplomacy which operates without political interference according to the small yet meaningful examples.

The journal and publisher and funding analyses show how the field operates through its fundamental conflict between its independent and unified nature. The political system of Iran restricts knowledge production but scholars from Iran maintain active participation in worldwide discussions about trade and health and sustainability. Western publishers continue to dominate their market space as Iranian research institutions gain more prominence which shows that sanctions have developed a stronger and more diverse national research system.

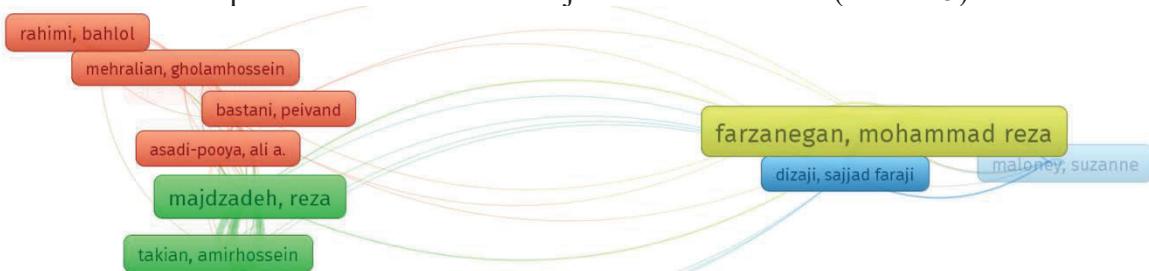
##### *5. Author Productivity and Intellectual Collaboration Networks*

The author-level analysis highlights the emergence of a distinct Iranian-led intellectual core within the global research on sanctions and trade, supported by smaller transnational clusters that connect health, economics, and policy perspectives. The research examined 2,283 authors who published at least three papers to discover 61 researchers who grouped into four main clusters and 26 active collaboration nodes.

The most prolific scholar is Mohammad Reza Farzanegan (13 publications), whose work at the intersection of political economy, sanctions, and development has defined much of the empirical research on Iran's macroeconomic performance under embargoes. His research which appears in Energy Policy and World Economy demonstrates how sanctions affect both public finances and price stability while developing methods to analyze Iran's situation relative to other countries with resource-based economies (Farzanegan, 2019; Farzanegan, 2025).

A second group of highly productive authors includes Xinxin Ma (8 publications) and Reza Majdzadeh (7), whose works expand the scope of sanctions research into international cooperation and public health. Majdzadeh and his colleagues have played a key role in evaluating the medical and epidemiological effects of sanctions through their analysis of how sanctions affect drug supply systems and national pandemic readiness. Watkins (7), Mohebali (6) and Vatandoost (6) also represent the biomedical aspect as they show how Iranian and international researchers work together on the humanitarian effects of economic sanctions.

The co-authorship network reveals four major thematic clusters (Picture 5):



Picture 5. Citations by authors

The first cluster (8 authors) led by Rahimi Bahlol and Asadi-Pooya Ali A. includes research on clinical and epidemiological aspects which examines both the secondary health impacts of sanctions and their effects on disease management. The cluster 2 authors (7 authors) under Reza Majdzadeh and Amirhossein Takian leadership unite public health with policy analysis to generate highly cited research about healthcare equity and medicine accessibility during sanctions. The third cluster (6 authors) consisting of Sajjad Faraji Dizaji and Suzanne Maloney combines economic modeling with international policy analysis to study how sanctions affect Iranian inflation rates and energy markets and political economy. The research field gains value from Maloney's involvement because he stands as one of the few remaining American experts who maintain their work in this field despite political obstacles. The fourth cluster consists of five authors who focus on quantitative economics and energy-trade nexus through econometric modeling and global commodity flows under the leadership of Mohammad Reza Farzanegan and Omid Zamani and Esfandyar Batman Ghelidj.

The research of sanctions needs knowledge from different academic fields which is demonstrated through the various clusters. The economic domain of Farzanegan and Dizaji remains prominent but Majdzadeh and Takian link their work between social medicine and public policy which gained importance starting from the mid-2010s.

The overlay visualization (Figure 3b) illustrates an evident chronological progression. The research networks from 2016 to 2018 focused on epidemiological and health-security studies according to Rahimi, Mehralian and Bastani but the post-2020 collaborations concentrated on governance and sustainable recovery according to Majdzadeh, Takian and Farzanegan. The research on sanctions expanded globally during 2022–2024 because Maloney and Ma joined as new nodes which enabled scholars to study how sanctions create effects between different economic systems across worldwide locations.

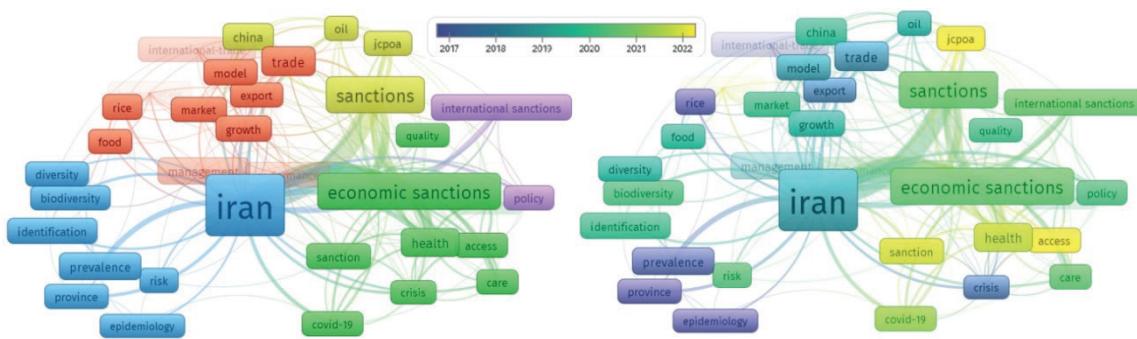
The time-based development shows how economic and health science fields now use their research approaches to study sanctions by studying their trade and economic growth effects and their health-related impacts. The academic world demonstrates its increasing partnership between these fields through their collaborative research output and their worldwide citation networks which show how scholars now study integrated resilience systems.

The author-level mapping demonstrates Iranian scholars maintain leadership in their field but the research network extends its connections to experts from every corner of the globe. The system demonstrates adaptive internationalization by showing researchers who use flexible collaboration methods and co-authorship and digital exchange to work through their limitations.

The research by Farzanegan and Majdzadeh about domestic productivity joins forces with external partnership studies by Maloney and Ma to establish a strong epistemic community that proves economic independence leads to humanitarian responsibilities. The intellectual development of Iran reflects its national effort to shift the sanctions story from being about limitations to becoming about creative solutions and combined knowledge fields.

#### *6. Keyword Co-occurrence and Thematic Evolution*

The keyword co-occurrence network in Picture 6 shows five interconnected thematic clusters which establish the intellectual framework of research about Iran's trade and sanctions. The research uses a minimum of nine keyword occurrences to identify 35 dominant terms which organize into five clusters representing major research areas including trade and development and health and humanitarian impact and biodiversity and environmental risk and energy and geopolitics and international policy frameworks.



Picture 6. Keywords co-occurrence

Cluster 1. The biggest cluster with 11 items focuses on the trade-export-growth-food nexus which includes applied studies that analyze how sanctions affect Iran's agricultural and industrial sectors. The research follows an economic modeling and supply-chain analysis approach because it uses terms like "market" and "management" and "performance" and "international trade." The combination of "rice" and "heavy metals" creates a connection between trade research and agricultural and environmental fields because it involves food safety and import substitution strategies during times of sanctions. The first cluster of research emerged during 2017–2019 when scientists attempted to measure how trade barriers affected production efficiency and export results and regional food market operations.

Cluster 2. The second cluster (10 items) focuses on humanitarian and public health aspects of sanctions research through terms including "economic sanctions" and "health" and "access" and "care" and "impact" and "medicines." The term "COVID-19 crisis" entered use in 2020 to describe how researchers moved their focus from economic studies to studying human welfare and system vulnerabilities during the pandemic. The cluster demonstrates the shift from studying economic systems at a large scale to examining specific effects of sanctions on healthcare services and medical supply systems and disease control measures. The research employs this terminology to analyze Iran as a case study for worldwide discussions about sanctions ethics and their humanitarian relief provisions through the integration of social justice principles with human rights standards.

Cluster 3. The thematic line contains eight items which explore biodiversity alongside epidemiology and environmental studies at the provincial level. The five fundamental terms "diversity" "identification" "prevalence" "risk" and "province" link public health issues to ecological and epidemiological research. The cluster contains research from applied natural and health sciences that appears in medical and agricultural journals to show how economic pressure affects disease transmission and ecosystem health and contamination rates in different regions. The research shows that sanctions studies now use biological field data to build their methodological base which goes beyond conventional macroeconomic and political approaches.

Cluster 4. The fourth cluster (4 items) – including "sanctions," "oil," "JCPOA," and "China" – captures the geopolitical and macroeconomic core of the sanctions discourse. The two clusters demonstrate Iran operates as a global energy governance actor because it controls the most oil production and participates in the Joint Comprehensive Plan of Action (JCPOA). The term "China" reflects the increasing role of Sino-Iranian trade and investment partnerships as both a research topic and a structural reality in post-2018 international relations. The research field started gaining momentum in 2020 when scientists investigated how Iran-China strategic cooperation would enable Iran to bypass Western economic sanctions through Belt and Road Initiative trade routes.

Cluster 5. The smallest cluster (2 items) – "international sanctions" and "policy" – occupies a bridging position across all thematic groups. The framework functions as an analytical tool that establishes connections between empirical studies and worldwide governance frameworks and legal

frameworks. The research under this theme uses comparative and theoretical methods to connect Iran's situation with other sanctioned nations including Russia and Venezuela and North Korea. The policy cluster functions as a theoretical framework that connects national case studies to international relations theory which enables conceptual advancement in this field.

The overlay visualization shows the historical progression of thematic priorities through time. The first publications from 2017 to 2019 analyzed trade and food and growth because they studied economic-institutional aspects of production and export systems. The network began concentrating on sanctions and health and crisis matters in 2020 because researchers found the humanitarian impacts of COVID-19 to be more significant. The relationship between oil and JCPOA and China and economic sanctions developed into a hybrid discussion that combines macroeconomic factors with geopolitical elements and ethical aspects during 2022 (Massol et al., 2024). The research shows that trade sanctions create changes in both domestic and international markets which strengthen the worldwide economic ties including Iran.

The field of sanctions research has evolved from basic economic damage evaluation to comprehensive studies of resilience which link trade with health and environmental factors in worldwide systems. The international community studies the effectiveness of sanctions as foreign policy instruments through Iran which functions as a national example.

The keyword network demonstrates that the field now encompasses multiple disciplines and research scales which connect economic studies with medical research and ecological investigations and policy analysis. The co-occurrence map shows that economic sanctions, health and trade exist in close proximity to each other indicating that researchers view these concepts as connected elements of a single system.

### Conclusion

The bibliometric study of 919 academic papers about Iran's trade and sanctions from 2002 to 2026 provides the most comprehensive evaluation to date of worldwide scholarly work in these subject areas. The research on Iran sanctions has evolved from being a fragmented policy-focused field into a unified interdisciplinary field to combine economic and political science with health and environmental studies.

The publication output of Iran follows the timeline of significant geopolitical events which include the 2010 UN sanctions and the 2015 Joint Comprehensive Plan of Action (JCPOA) and the 2018 U.S. withdrawal and the COVID-19 pandemic. The political shocks led to separate waves of academic research because they directly influenced how scholars produced knowledge. The field demonstrates both conceptual growth and methodological progress because its 73% peer-reviewed journal articles and rising review paper output in the 2020s.

Academic research now studies sanctions as instruments of foreign policy and as multiple stressors which impact human welfare and technological development and environmental systems.

The research depends on Iran as its intellectual foundation and experimental site. The national scholarship system relies on Iran's domestic universities including Islamic Azad and Ferdowsi University but the country continues to build academic ties with Europe, North America and Asia. The coexistence of Western publishing dominance and the growing visibility of Iranian institutions signifies a hybrid structure of "dual circulation," where local research adapts to global dissemination frameworks despite constraints on funding and mobility.

The author-level analysis demonstrates how Farzanegan and Majdzadeh and Takian created linked clusters which combined economic and humanitarian perspectives. The analysis of keyword co-occurrence demonstrates that sanctions research has shifted from economic loss evaluation to study resilience-based system-level assessments which include trade and health and sustainability aspects.

The research demonstrates how Iran maintains complete adaptability through its academic work under sanctions by showing its intellectual strength and academic diversity despite restricted global access. The research field evolved from a national issue into a worldwide framework for studying economic coercion effects on human development through its connection to Sustainable Development Goals and new ideas about global justice and sustainable governance.

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## ФАЛАМДЫҚ САУДА ЖӘНЕ САНКЦИЯЛАР ЗЕРТТЕУЛЕРИНДЕГІ ИРАН: БИБЛИОМЕТРИЯЛЫҚ ТАЛДАУ (2002–2026)

**Аңдатпа.** Мақаланың мақсаты – 2002–2026 жылдар аралығындағы Иранның жаһандық саудасы мен санкцияларына қатысты ғылыми жарияланымдардың дамуын библиометриялық түрғыдан талдау. Зерттеу халықаралық экономикалық саясат пен жаһандық басқарудағы Иранның орнының эволюциясын көрсетеді. Жаңалығы – бұл тақырып бойынша алғаш рет кешенді библиометриялық карта жасалып, зерттеу бағыттарының динамикасы мен құрылымы сандық және желілік әдістер арқылы сипатталды. Зерттеу міндеттері – жарияланымдық белсенділіктің уақыттық өзгерісін талдау, жетекші авторлар мен ұйымдарды анықтау, елдер арасындағы ғылыми ынтымақтастықты бағалау және негізгі тақырыптық кластерлерді айқындау. Әдістемелік негіз ретінде Web of Science деректер базасындағы 919 жазбадан құралған деректер жиынтығы қолданылып, VOSviewer бағдарламасында авторлар, кілт сөздер және дәйексөздер желісі талданды. Нәтижелер көрсеткендегі, Иранға қатысты санкциялар зерттеулері тар экономикалық бағыттан денсаулық сақтау, экология және тұрақты даму салаларына дейін кеңейді. Иран ұлттық зерттеушілік орталық ретінде қалыптасып, Еуропа және Азиямен академиялық байланыстарын қүштейтті. Қорытындысында, санкциялар мен сауда жөніндегі зерттеулер тек экономикалық шектеулердің әсерін ғана емес, сонымен қатар адам әл-ауқаты мен жаһандық әділеттілікті талдаудың жаңа парадигмасын ұсынады.

**Кілт сөздер:** Иран, санкциялар, жаһандық сауда, библиометриялық талдау, тұрақты даму.

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## ИРАН В ГЛОБАЛЬНЫХ ИССЛЕДОВАНИЯХ ТОРГОВЛИ И САНКЦИЙ: БИБЛИОМЕТРИЧЕСКИЙ АНАЛИЗ (2002–2026)

**Абстракт.** Цель статьи – провести библиометрический анализ научных публикаций, посвящённых торговле и санкциям в отношении Ирана в 2002–2026 гг. Исследование показывает

эволюцию и институциональное оформление данного направления в мировой науке. Научная новизна заключается в создании первой комплексной библиометрической карты, отражающей динамику публикаций, структуру соавторств и тематических кластеров. Основные задачи – проанализировать эволюцию исследовательской активности, выявить ключевых авторов, организации и страны, определить направления международного сотрудничества и тематические тенденции. Методика основана на анализе 919 публикаций из базы Web of Science с использованием программного обеспечения VOSviewer для визуализации сетей соавторства, ключевых слов и цитирований. Результаты показали, что исследования санкций против Ирана трансформировались из узкоэкономической тематики в междисциплинарную область, охватывающую экономику, здравоохранение, экологию и устойчивое развитие. Иран выступает ядром научного сообщества, а его сотрудничество с Европой и Азией усиливается. Заключение: изучение санкций против Ирана стало частью глобальной научной повестки, отражая не только экономические ограничения, но и вопросы социальной устойчивости и глобальной справедливости.

**Ключевые слова:** Иран, санкции, мировая торговля, библиометрический анализ, устойчивое развитие.

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