

A Bibliometric Study: Women Entrepreneur Investment and Risk - Looking 1980 to 2029**Purnachandra Rao Suda****Assoc. prof., NRI, Institute of Technology (KP), Guntur, India****Abstract**

Women becoming entrepreneurs are seen as a positive indicator of women's empowerment. However, for emerging businesses to achieve sustainability, effective management of investment and risk practices is deemed essential. It is noted that entrepreneurship practices garnered the highest number of publications between 1980 and 2022. Nevertheless, research specific to women entrepreneurs' investment and risk (WEIR) yielded only 725 documents in Scopus. The primary objective of this bibliometric study is to analyze the five-decade progression of research on the WEIR trend, projecting linearly up to 2029. The study aims to identify the leading nations, institutions, and authors contributing to the literature on WEIR. Additionally, cluster analysis using VOSviewer was employed to explore co-occurrences of author keywords. The trend analysis indicates a positive trajectory in WEIR research up to 2029. Most literature documents have been cited fewer than 25 times, with the second decade exhibiting the highest citation frequency. Notably, the United Nations and Yale University have emerged as significant contributors to WEIR literature. The findings underscore the necessity for extensive and sustained scholarly attention to support the empowerment of women entrepreneurs. Long-term, comprehensive literature is imperative to address the diverse challenges and opportunities facing women in entrepreneurship.

Keywords: Women, Entrepreneur, Investment, Risk, Bibliometric Review, forecasting VoSViwer

Introduction

When people learn and use entrepreneurial skills. They are better able to lift themselves out of poverty, improve their quality of living, secure their financial futures, boost their self-esteem, and effect positive change in their communities (Bang et al., 2022). According to a new Global Entrepreneurship Monitor (GEM) titled Women's Entrepreneurship Report 2021/2022, one-third of women entrepreneurs introduce innovative products and services to national or international markets with novel products or services particularly in emerging markets. Worldwide, women have taken the initiative to mobilize investment resources and taken risk to become successful entrepreneurs (Bang et al., 2022; Deng et al., 2020). it helps to crucial role in economic and social growth via entrepreneurship (Raman et al., 2022). Present Emerging market; women are interested taken investment risk to becoming entrepreneur. But the competitive market challenge and impossible for women to run own business in from developing world, because of uncertainty faced by women entrepreneurs' investment factors for developing new enterprises, the inability to diversify business risk, and entrepreneur growth among household women (Caggese, 2012).

The scientific literature helps policymakers and entrepreneurs overcome competitive business risks. The first entrepreneur Literature published paper, "American municipal services from the standpoint of the entrepreneur," was published in the Scopus database in 1906 with the invitation of Johes in The Annals of the American Academy of Political and Social Science. Sixty years later, a women's entrepreneur-based research paper, "Family oriented, level of aspiration, and interpersonal bargaining," was published in the Journal of Personality and Social Psychology by Crown in 1966. By the end of 2022, nearly 10% of academic journal publications on women entrepreneurs had grown to 5689 out of 57047 documents of entrepreneur literature published in the Scopus database on topics such as investment, risk, empowerment, leadership, sustainability, and innovation. Literature progress and trend understanding through bibliometric analysis. As a result, several bibliometric studies on topics relevant to women entrepreneurs have attempted to use Scopus, Web of Science, and Google Scholar metadata analysis, such as "Women Entrepreneurship and Sustainable Development" by Raman et al., 2022; "Female Entrepreneurship" by Deng et al., 2020; "Rural Women Entrepreneurship" by Parmar and Gahlawat, 2020; and "Study of the Incursion of Women in

the Field of Entrepreneurship by Feijo-Cuenca, et al., (2019)." This study looks at the R.Q. 1 to R.Q.6 relevant scientific literature on women entrepreneurs' investment and risk (WEIR).

R.Q. 1: What are the pertinent research areas and global research trends, with citations?

R.Q-2: Examine the decade-wise citation score status.

R.Q-3: Determine the year-by-year contribution of the nation to literature.

R.Q-4: Institutional performance on Literature Contribution status in scopus metadata.

R.Q-5: Who are the top ten leading female entrepreneurs?

R.Q-6: Examine the co-occurrence of the author's key words in globally conducted research.

The expected outputs will provide a comprehensive overview of the current state and trends in WEIR research, highlighting significant contributors, key areas of interest, and global research patterns. This analysis is anticipated to aid in understanding the development and future directions of women entrepreneurs' investment and risk studies.

Review of literature

Developing literature indicates that; Sarfaraz et al., (2014); According to emerging research, women may play an important part in the greater entrepreneurial phenomenon and economic growth. As a consequence, there is a pressing need to examine many aspects of female entrepreneurship. Relevant conceptual ideas must be broadened in order to better describe the distinctiveness of women's entrepreneurship as a study topic. In order to address the demand for better knowledge, this study seeks to offer an overview of the area as well as future research possibilities.

R.Q. 1: What are the pertinent research areas and global research trends, with citations?

Raman et al. (2022) revealed in their bibliometric investigation that women entrepreneurs' sustainable literature was produced slowly up to 2010. From 1991 to 2014, the pattern of document publishing growth was quite modest, but it subsequently doubled the number of documents published as well as citations since it was more appealing to researchers and academicians. Deng et al. (2020) discovered a sluggish trend from 1975 to 2006 and a rising, growing trend from 2006 to 2014, which were published yearly below 50 documents on research of the attributes of women entrepreneurs. Chen et al. (2022) evaluated the annual publications and citations of 296 articles to assess the current research trend and forecast future trends over the previous two decades. The result is an important indication for demonstrating the scientific research publication trend on content or literature: positive expansion on total publication and total citation, rising scientific effect on the issue, and favorable discoveries shown in the regression curve (Majumder et al., 2021). The population will likely increase in the long run. Understanding the literature output and trend is similar to improving literature publication, but the initial stage of the literature is varied, and annual document publication and citations vary from one study to another. To Study Five decades document publications and citations trend.

R.Q-2: Examine the decade-wise citation score status.

Ghalawat and Parmar (2020) The first three decades of rural entrepreneurship globally in scientific literature (188 publications) created relatively few citations (10.08 percent), and 52.77 percent is the maximum citation when compared to others, while the second decade achieved the greatest average citation for a published paper (21.16%). Aparisi-Torrijo and Ribes-Giner (2022) investigated the class incremental interval for citation output frequency% analysis for the ease of general citation examination; the projected number of documents based on citation is 55.2 percent of documents listed up to nine, followed by 10 to 19 cited documents for a total of 9.8 percent out of 182 documents. Only 26% of articles are not cited, 91% are mentioned fewer than 20 times, and only one document has been cited 200 times and is indexed in the WoS up to and including 2020. Observing two studies' summaries, find the decade-wise and citation interval-wise literature output in updated meta data by reviewing document publications and citations.

R.Q.-3: Determine the year-by-year contribution of the nation to literature.

Feijo-Cuenca et al. (2019), Conclusion: According to the results of bibliometric analysis of women in the field of entrepreneurship, the United States and the United Kingdom make significant contributions, with Spain ranking third and India ranking fourth in scientific literature document publications among top nations. Deng et al., (2020)

discovered that the United States contributed the most with 889 papers on women's entrepreneurship (1975–2018) in published literature, followed by England, which published 336 scientific literature papers. Similarly, Ramana et al. (2022) discovered that the United States published a large number of documents from 1990 to 2020 (59) in bibliometric analysis. The results of Syed and Bawazir's (2021) bibliometric study indicate contributions from the United States (1097). China provided the most papers (473) to the research of financial risk in business literature, followed by the United Kingdom (422) out of 1097. Eight of the top 10 are developed nations, with the exception of Romania and Ukraine. The second and other positions of the nation's contribution on literature publication changed after the second position, as well as the volume of documents from one study to the next, so this study found the updated nation's contribution status on literature.

R.Q-4: Institutional performance on Literature Contribution status in scopus metadata.

Konys (2019), observed in his study that, when looking at the top ten institutional contributions of literature publication in Scopus meta data on sustainable entrepreneurship, Leuphana University Luneburg contributes 25% of the documents, Technical University Munich contributes 13% of the documents, and Wageningen University and Research Center contributes 11% of the documents produced out of 160 institutions from 2010 to 2018. Likewise, Raman (2022) found in his study, Babson College published 34 papers and was referenced 2729 times; the University of North Carolina at Greensboro published 25 documents and was cited 611 times; and the University of Ghana published 14 documents and was cited 193 times. Deng et al. (2020) identified the three most significant contributing scientific literature documents discovered at the University of North Carolina (39), Erasmus University (22), and the University of Toronto (21). Observing the results of bibliometric analyses of institutions ranging from research to study to determine the current state of institutional contribution to scientific literature publishing through 2022.

R.Q-5: Who are the top ten leading female entrepreneurs?

Focusing on bibliometric analysis, Syed and Bawazir (2021) observed that top authors with the greatest number of publications as the articles published criteria, largely driven by Kljuckikoy and Kozubikova's focus on authors, were chosen based on the selection criteria of having the most publications as well as the highest h-index. From 2015 to 2020, Belas, the author with the most published papers, wrote seven and garnered 215 citations, followed by Kljuckikov, who published five and generated 119 citations. Raman et al., (2022) looked at the top ten writers' contributions to women entrepreneurs' literacy in two ways: first, the author contribution of higher publications, and second, the top ten cited authors until 2020. Brush and Walter each authored 41 publications, with Brush materials referenced 2823 times and Welter documents cited 2163 times, ranking first and second, respectively. Henry published 28 papers in third position, but Marlow only mentioned the top three in the citation (1304) list, while the top document published list was in ninth place. Total publishing and total citation show the author's performance on literature, which this research determines to be the author's citation score.

R.Q-6: Examine the co-occurrence of the author's key words in globally conducted research.

The major subject of the research field and research trends are described by the co-occurrence of the authors' key words (Syed and Bawazir, 2020). Based on relevance density, the pertinent key words are separated into clusters (Kamath et al., 2022). Block and Co. (2020), Four clusters were identified by the investigation, including economics and finance (six), culture, institutions, and women (eight), social capital (five), ethnicity (five), and immigrants (three). Similarly, Raman et al. (2022) identified four clusters in the bibliometric word embedding keyword output of 843 publications, including gender issues affecting women's entrepreneurship (14 key words), economic growth and sustainable development (25 key words), women entrepreneurs in SMEs (11 key words), and women's entrepreneurship contribution to sustainability and the informal economy (10) Based on an examination of the keyword occurrence summary, figure out the current movement in research on women entrepreneurs. The primary key motive of the women entrepreneur includes the general appearance of the WEIR 26 scopus meta data keywords.

Women's entrepreneurship education, aids in innovation (Chitimiea et al., 2020), and sustains community and national development. Women's entrepreneurship is a growing trend in developing countries. After the pandemic, women's entrepreneurship continues to improve in the world for self-employment, and its effects reach both the community

and the country (Raman et al., 2022). The entrepreneurial orientation's competitive performance is represented by business risk (Wang and Juan 2016). According to Deng et al. (2020), there is a changing attitude toward risk-taking propensities and intentions toward entrepreneurship among female entrepreneurs who take risks to mobilise their finance to strategize a new venture. Women's educational knowledge and entrepreneurial performance indicate the global women's human capital index. Women's involvement in household activities, in general, has an impact on their lack of business external knowledge and education skills when compared to men, but today's women are willing to invest in new venture startups (Deng et al., 2020). Educated women entrepreneurs have the ability to recognise market gaps and innovately perform entrepreneurship operations. Women are investing proactively in entrepreneurship for income generation. Syed and Bawazir (2021) discussed enterprise financial performance (financial investment and risk) in recent research studies. Corporate governance involvement may include four dimensions such as ownership, management, governance, and intention for succession. Governance mechanisms are better recognised by external stakeholders and provide positive control over enterprise operations (Chen, et al., 2016). Governance cluster: addressing the environmental performance of India and China with great economic power, they introduce new practises in emerging markets (25. Fallah, and Soori 2022, Enciso-Alfaro and Garca-Sánchez, 2022). The microfinance programme for women's entrepreneurship helps SMEs; microfinance is developing an awareness programme for women's involvement in SMEs' operations. Microfinance programmes empower women's living standards by developing SMEs and/or entrepreneurship and providing financial and non-financial services. Women's entrepreneurship promotes self-employment, income generation, poverty reduction, financial resilience, and self-sufficiency (Kaushal et al., 2021; Deng et al., 2020). On the basis of the literature review summary, we determine the current research productivity, trend, and major contributing nations, authors of the WERI. Study the below objectives based on the Scopus meta data on WEIR.

Study Objective:

1. To investigate Five decades global research document publications and citations trend.
2. Examine the cited document's decade output on the incremental class interval.
3. To find the Top Ten Nations' Literature Contribution in the Scopus Database,
4. To find the top ten institutions' literature contributions in the Scopus Database.
5. To find the top ten authors' citation score on published literature documents.
6. To summarizing the author's key word co-occurrence in globally conducted research.

2. Methodology

The study will examine the development of WEIR throughout more than three decades of Scopus metadata gathering. As far as the author is aware, this is the first attempt to describe how the scientific literature impacts WEIR. To close a gap in the rising scientific literature on WEIR research worldwide... It will be helpful to have an analysis summary that shows how important it is for policymakers and academics to keep track of research progress and trends in this area. Bibliographic data is helpful in social science research because it gives quantitative results from qualitative data analysis for literature generation and author keyword co-occurrence analysis using VOS-Viewer software. Three levels of the SPAR-4-SLR approach, each with six steps, were established as a result of bibliometric research (assembly, which includes data identification and collection, arranging, which provides for data organization and purification, and finally, evaluating, which includes data assessment and reporting). It helps to have a step-by-step process of the bibliometric review analyzed based on bibliometric data. Data analysis revealed five decades (1980-2029), Scopus metadata revealed 43 years, and the linear estimate showed seven years. The performance of the WEIR research was analyzed using the statistical simplifications listed below. The linear furcating tool used to estimate literature publication progress up to 2029 (it covers five decades of the journey from 1980 to 2029) summarized below formulas in MS Excel using Scopus metadata.

2.1 Research Design

Figure-1 SPAR-4-SLR review protocol stages.

Assembling	
Stage-1: Identification	Stage-2: Acquisition
Review Domain: Women Entrepreneurship Investment Risk Research Question: R.Q-1 to R.Q-6 Document Type: Journal Paper Source Quality: Scopus	Search Period: 1986-2022 TITLE-ABS-KEY Words: ((women OR female) (entrepreneur OR entrepreneurs OR business OR self-employment OR "Self-Employment" OR "Startup") (investment OR investments) OR ("Risk Management" OR "Risk Assessment" OR risk OR risks OR "Risk Perception" OR "RISK Taking" OR risk-taking OR "Risk Factor" OR "Risk Factors" OR "Risk Analysis" OR "Risk Aversion" OR risk-analysis OR risk-aversion)) Total No of Publications:
Stage-4: Purification	Stage-3: Organization
Total Articles Included: 725, Women Entrepreneur Investment: 294 Women Entrepreneur Risk: 477	Filtering Document Type: Articles, Review, Conference proceeding and Chapters Filtering Category: Business, Economics Source type: Journal, Trade Journals
Assessing	
Stage-5: Evaluation	Stage-6: Reporting
Analysis Method: Bibliometric using VoS viewers Proposal Method: Research performance analysis, Forecasting and network analysis. Agenda proposed method: research trend, research gap and area of future research.	Reporting Conventions: Figures, Tables. Words Limitations: Data Accessing from Scopus and language of the data. Source of Support: No funding

2.2 Summarizing Formula

Figure-2:

- AD-Annual Documents publications
- AC-Annual Citation on Published Document
- TD- Annually Cumulative Documents Published
- TCD-Annually Cumulative Cited Documents
- Trendline on TD with forecasting Linear Forecasting
- Trendline on TCD with forecasting Linear Forecasting
- Trendline on AC with Linear Forecasting

Linear Forecasting Linear Formula

- Linear Regression Equation $Y = mx + c$
- M=SLOPE (Estimated Value Range, Time Frame Range)
- C=INTERCEPT (Estimated Value Range, Time Frame Range)
- X=No of Years
- $Y = ACD / ACCD / ACG$

Table-1

TC-AC Cumulative

$$\text{CDP-Citation for document percentage (CDP} = \frac{\text{TC}}{\text{TCD}} \times 100)$$

Table-2

TDI = TD published by Institution,

TCDI = TCD published by Institution,

TCI = TC By the Institution

$$\text{ACTDI-Average Citation of TDI (CTDI} = \frac{\text{TCI}}{\text{TDI}})$$

$$\text{ACCDI-Average Citation of TCDI (CCDI} = \frac{\text{TCI}}{\text{TCDI}})$$

Table-3:

APTD-Author Published Total Documents

LTAD-Life Time of the Author published Document (2023-Documents Published Year)

ADC-Author Document Cited

$$\text{AADC} = \text{Average ADC (AADC} = \frac{\text{ADC}}{\text{LTAD}})$$

$$\text{AACD-Average Citation of Author Documents (AACD} = \frac{\sum \text{ADC}}{\text{APTD}})$$

Total Citation on WEIR =20623

Total Documents on WEIR=725

$$\% \text{ATC-Percentage of ADC in WEIR citation (\%ATC} = \frac{\text{Total Citation on WEIR}}{\text{APTD}})$$

$$\% \text{ATD- percentage of APTD in WEIR documents (\%ATD} = \frac{\text{Total Documents on WEIR}}{\text{APTD}})$$

3. Results

Over the last 50 years, research on female entrepreneurs has grown, and risk and investment are essential tools for entrepreneur economic success. These are signs of the managerial skills of women entrepreneurs (Bang et al., 2022). Scopus metadata productivity of documents and citations with periodicals and continuing class intervals output shows the top papers published by authors, institutions, and countries. In addition, using VOSviewer software helps find the cognitive structure of WEIR literature and critical topics of AKO through a visualization map. The WEIR needs literature for both policymakers and academicians.

3.1 WEIR Research Trend

The study determines the total number of documents published by scholars each year and their citation status. Weir literature productive status in the Scopus database document and citation trend on four aspects: narrowly pink in the X-axis represents annual literature documents published, and the green collar bar chart illustrates annual citation, with 20839 total citations generated from 1980 to 2022. the research output of the trends from linear forecasting in WEIR research.

Figure-2: Annually Documents and Citations

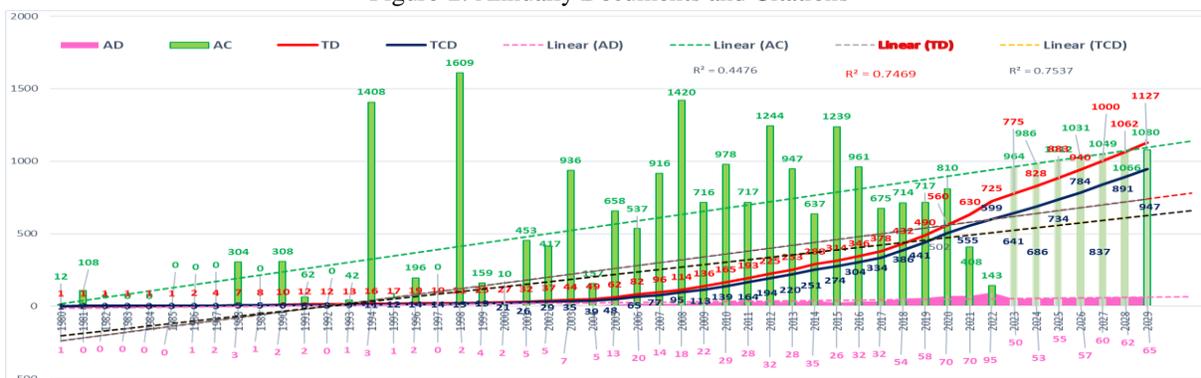


Figure-2 shows that the scientific literature on TD and TCD gradually increased annually (Filatova et al., 2022) following the rapid increase in AD (95 documents published) globally in 2000. Its unmistakable appearance of the results of TD took a step upward (725) in red colour and also black colour TCD (599) in the Scopus database up to 2022 (Majumder et al., 2021; Syed and Bawazir). The forecasting results show an annual difference between the TD and TC up to 2029. The trend line of TD and TCD up to 1993 had a negative value in the x-axis, but after that, it had a positive value in the x-axis with positively published WEIR literature up to 2029. The annual total citation (AC) of the WEIR documents fluctuates. However, the trend line represents an upward slope with positive values from 1980 to 2022 and a fluctuating duration up to 2029. The trend lines show continued growth of WEIR literature from 1980 to 2022 (Chen et al., 2022; Parmar & Ghalawat, 2020), and forecasting duration up to 2029, it is a signal of the economic growth of nations on the development of women entrepreneurs (Chitimiea et al., 2020). The linear forecasting with "R2" values on total published documents is 0.7542, and the total cited document is 0.7607; the citation score of published documents cited is "R2." If the value is 0.4611 in WEIR and is forecasted to improve year by year up to 2029, it means published documents are cited significantly in research. Literature progress forecasting up to 2029 indicates that total documents and cited literature documents are declining in 2023, then slightly improving year on year. They all have good attention and positive growth worldwide (Luo et al., 2022), apart from the citation values, which indicate more than 75 per cent of their predictions.

3.2 Decade-wise Distribution of Citations

Three decades of data analyzed with citation class intervals are shown in table-1, the apparent appearance of more than the three-decade period from 1980 to 2022. The citation class interval is divided into valuable aspects. This study examined TCD, TC, and CDP output on WEIR decade output in Table 1. TCD has steadily increased across all decades. Initially, they were deficient (1.34 per cent) for twelve published documents and 798 citations of the eight documents; later, in the 1993–2002-decade, one document cited an output of 1609 out of 4520 citations, or 3.67 per cent of twenty-two cited documents out of twenty-five documents. From 2003 to 2012, 164 documents (27.38 per cent) were cited 8276 times out of 180. Finally, 500 documents were published between 2013 and 2022, resulting in 67.61 per cent (405 documents) and 7245 citations in the WEIR research output.

Table-1: Decade-wise citation output of publication

Citation Interwall	1980-1992		1993-2002		2003-2012		2013-2022		Total
	TCD	TC	TCD	TC	TCD	TC	TCD	TC	TCD
0<25	3	17	9	70	82	988	331	2335	425
26-50	-	-	3	120	41	1499	41	1435	85
51-100	1	61	1	98	19	1333	22	1526	43
101-200	3	412	5	712	16	2346	9	1156	33
201 -400	1	308	2	504	4	805	1	304	8
401-800			-	-	2	1158	1	489	3
801-1600			1	1407	-	-	-	-	1
above 1600			1	1609	-	-	-	-	1
Total	8	798	22	4520	164	8129	405	7245	599 (20692)

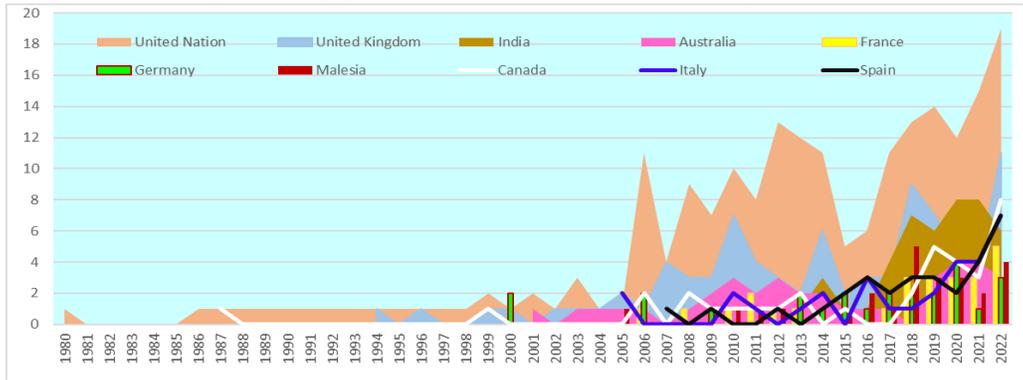
To better understand the WEIR literature document output, it is essential to note that fewer than 25 cited documents accounted for more than 70 per cent of documents (425) over the last several decades. Additionally, scholarly outputs with 26 to 50 citations made up 14.19 per cent of the total, and documents with more than 800 and 600 citations made up 0.17 per cent, respectively, of all literature papers published on WEIR. The citation rate for the referenced document in WEIR research output is 34.54 per cent of CDP. An outstanding score of 205.45, followed by the early stage (1992–2002) with a percentage of 99.75 and the present decade with 17.89.

3.3 Top Document-Producing Countries

Top four nations The WEIR research journey appears in the area chart, followed by three nations in the line chart, and three nations in Figure 2 using clustered column bar charts for better visibility. Figure-3 shows that, among the top

ten nations' WEIR literature documents published in the Scopus database annually from 1980 to 2022, the United Nations is the first and largest publishing nation in the area of WEIR (Chitimiea et al., 2020). It consistently produces 28.28 per cent of the scientific literature compared to other top ten nations without defaulting, followed by Canada, which began publishing in 1987 (Syed & Bawazir, 2021), but with a lower percentage. India rigorously publishes 6.34 per cent of scientific literature in the Scopus database.

Figure-3: Top Ten Nations Annually Documents published



In one decade, it achieved third position from 2012 to 2022, and all top ten nations published documents without default publication (Majumder et al., 2021). France, Germany, and Malaysia began WEIR research after 2000, each contributing a similar 3.45 per cent of research output.

3.4 Top Documents Produced by Institutes Citation Output Analysis

The top ten research documents from contributing institutions are represented in the table-24, and those between which there were citations are represented in more detail. Using the Scopus data set for document citation and cited document citation, the top 10 universities' contributions to literature, documents, and citations were studied (Raman et al., 2022).

Table-2: Top 10 WEIR Literature publication contributing institutions

S. No	University	TDI	TCDI	TCI	ACTDI	ACCDI
01	Universitat da Valencia	7	6	131	18.71	21.83
02	Babson College	7	7	324	46.29	46.29
03	Universiti Utara Malaysia	6	6	33	5.50	5.50
04	Univerzita TomaseaBati ve Zline	6	6	213	35.50	35.50
05	National Bureau of Economics Research	6	6	515	85.83	85.83
06	The University of Western Austalia	6	5	302	50.33	60.40
07	Griffith University	6	5	111	18.50	22.20
08	Griffith Business School	6	5	115	19.17	23.00
09	Yele university	5	5	812	162.40	162.40
10	University of St. Thomas, Minnesota's	5	5	335	67.00	67.00

From 1980 to 2022, the top ten universities published 60 papers that received 2891 citations for an average citation rate of 48.18, which is higher than the average citation rate for all institutions (8.77). Table-2, expressing results on WEIR Interestingly, even though the University of Valencia and Babson College both similarly published seven papers, Babson College received the most citations (324), with seven of its publications. Yele University merely created five papers, yet it outperformed the top 10 universities in terms of the number of citations (812), and the overall citation contribution is 0.79 per cent, with the average citation for the document and the average citation for the cited

document being 162.4. Out of the top ten institutions, eight have more than five documents published in WEIR (Ruihui et al., 2021).

3.5 Top 10 Authors with Citations Published Documents

Figure 3 depicts the output of the ten researchers who contributed the most documents (Ruihui et al., 2021) and the total citation generation over the document's lifetime (LTD) up to 2022. This study analysed the annual average document citation (AACD) based on the document's life and total citations and accessed individual author average document citations (ADC) on WEIR.

Table-3: Top 10 Authors Published Documents with Citation

S. No	Authors	Year	Source	APTD	LTAD	AADC	AADC	%ATC	%ATD
1	Brush	2020	ISBJRE	75	3	25.00	99.50	2.89	0.83
		2018	IJGE	27	5	5.40			
		2009	SBE	104	14	7.43			
		2006	VC	74	17	4.35			
		2002	VC	126	21	6.00			
		2001	VC	191	22	8.68			
2	Greene	2009	SBE	104	14	7.43	420.80	10.17	0.69
		2006	VC	74	17	4.35			
		2002	VC	126	21	6.00			
		2001	VC	191	22	8.68			
		1998	JBV	1609	25	64.36			
3	Hart, M.M.	2009	SBE	104	14	7.43	123.75	2.40	0.55
		2006	VC	74	17	4.35			
		2002	VC	126	21	6.00			
		2001	VC	191	22	8.68			
4	Watson	2014	IJGE	13	9	1.44	72	1.39	0.55
		2013	IJGE	56	10	5.60			
		2009	IJGE	48	14	3.43			
		2003	JBV	171	20	8.55			
5	Amatucci	2016	IJGE	3	7	0.43	25.67	0.37	0.41
		2011	JDE	13	12	1.08			
		2004	VC	61	19	3.21			
6	Belas	2019	EEI	0	4	0.00	0	0	0.41
		2016	TBE	0	7	0.00			
		2016	JIS	0	7	0.00			
7	Carter	2009	SBE	104	14	7.43	101	1.46	0.41
		2006	VC	74	17	4.35			
		2002	VC	125	21	5.95			
8	Edelman	2022	SBE	5	1	5.00	35.67	0.52	0.41
		2020	ISBJRE	75	3	25.00			
		2018	IJGE	27	5	5.40			
9	Gatewood	2014	IJGE	13	9	1.44	63.67	0.92	0.41
		2009	SBE	104	14	7.43			
		2006	VC	74	17	4.35			
10	Gill	2019	EMR	23	4	5.75	12	0.17	0.41
		2018	IJGE	10	5	2.00			
		2018	IJESB	3	5	0.60			

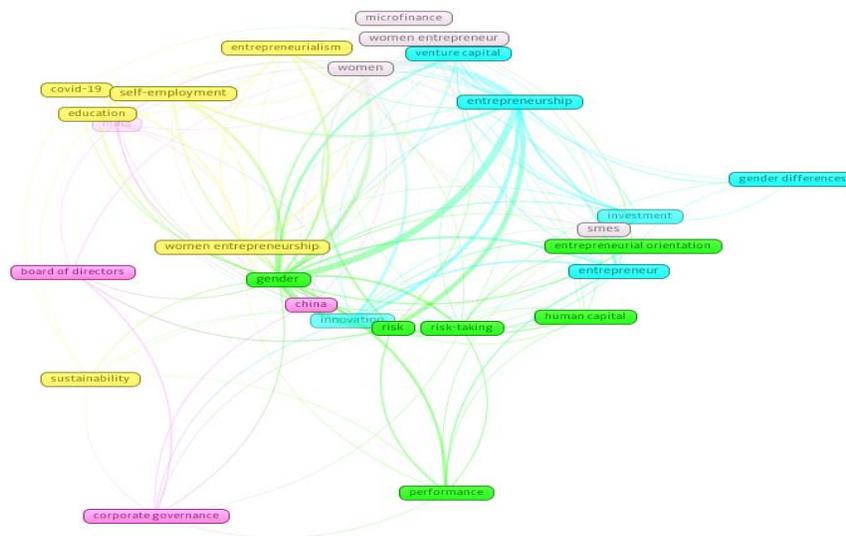
Note-1: VC-Venture capital, SBE- Small Business Economics, IJGE- Int. J. of gender and entrepreneurship, IJESB- Int. J. of Entrepreneurship and Small Business, EMR- Emerging Markets Review, JBV- J. of Business Venturing, ISBJRE-Int. Small Business J. Researching Entrepreneurship, JIS-J. of Int. Studies, JDE-J. of development Entrepreneurship, TBE-Transformation in business and economics, and EEI- Economic Ekonomiska Istrazivanja

The top ten authors in Table 3 represent 37 document publications and 4,198 citations of WEIR research. Brush produced seven documents over a two-decade period (2000 to 2020), accounting for 0.83 per cent of total documents and 2.89 per cent of total citation contribution. The brush scholar citation output of ADC is 99.50 up to 2022, followed by Greene, a silver jubilee author; publication began WEIR research in 1998; second in total document contribution (0.69 per cent), but first in citation generation (10.17 per cent). The first document received the most citations (1609) up to 2022 and the highest score document AACD in WEIR research (Raman et al., 2022). Similarly, six documents were produced in the first 12 years of the research (1998-2009). Although the research output is significant, the lifespan of the produced documents is 25 years. Greene is the top ACD 420.80-scoring author in WEIR. Edelman and Brush, who scored 25 AACD in WEIR, are the second and current scholars. Hart, M.M., is second with 123.75 ACD, and Carter is third with 101 ACD. Belas contributed three documents from 2016 to 2019, but no citations were generated until 2022. Gatewood is the second scholar in the top documents contributed authors with the most citations (0.92 per cent) in WEIR up to 2022. Most of the Top Authors published in VC (11 documents), IJGE (8 documents), and SBE (6 documents).

3.6 Author Key Word Co-occurrence Cluster Analysis

AKO clustering to relevant themes in WEIR research documents using a minimum threshold of ten appearances and mentioning at least five words for clustering (Block et al., 2020). Furthermore, the significance and summarising of cluster theme, author keyword occurrence (AKO), and author total link strength (AKL) are based on VOSviewer's output of trending 26 author keywords with five clusters.

Figure-3 Author key word clustering



Every cluster represents an existing publication of literature on the themes, which helps expand the research. Cluster 1 represents sustainability in yellow (women entrepreneurs 37, self-employment 22; education, entrepreneurialism, and education 12; COVID-19-11 time); cluster 2 supports risk-relevant factors (gender 122, risk 43, risk-taking 14; human capital 12; performance 11; and entrepreneurial orientation 10) in green. Cluster-Three (Entrepreneur-24, Entrepreneurship-81, Gender-12, Innovation-26, Investment-14, and Venture Capital-14) in Navi Blue, Cluster-four is represented by pink (corporate governance: 14; India: 11; the board of directors: 10; and China: 10); and cluster-five is represented by silver (women: 71; women entrepreneurs: 50; SMEs: 19; and microfinance: 11), as shown by their keyword occurrences in Figure-3.

Table-4, represents the cluster analysis and assists the AKO and AKL in understanding the trending keywords of the WEIR research. Educated women are entrepreneurial and financially independent. Families and the economy benefit from women's enterprises. 93% of female company owners originate from developing countries. Entrepreneurship is hazardous, and gender impacts the willingness to take risks. Every day, women take more risks and become more

entrepreneurial. In emerging nations, entrepreneurial women are boosting their human capital. Globally, males dominate high-investment entrepreneurship. Investments made by microentrepreneurs based on innovation survive.

Capital investment bolsters women's entrepreneurship the most. On Asian business boards, corporate governance is influenced by women respective of CSR (Gaio and Gonçalves, 2022). The best corporate governance is beneficial to both governments and communities. The finest programme for low-income family women is microfinance. Women entrepreneurs have boosted SMEs through finance in all emerging economies.

Table-4: Cluster Analysis on Author key Words Co-occurrence summary

S. No	Cluster	Key Words	AKO	AKL	Author key Words Summary
1	Sustainability	Covid-19	11	10	Education empowers women to be entrepreneurial and financially independent. Women's entrepreneurship benefits families and national economic growth. Ninety-three percent of female company owners are from low- and middle-income countries.
		Education	12	12	
		Entrepreneurialism	12	26	
		Self-employment	22	23	
		Sustainability	12	8	
		Women Entrepreneurship	37	32	
2	Risk	Entrepreneurial Orientation	10	11	Entrepreneurship is a high-risk undertaking, and attitudes toward taking risks vary by gender. Women now take performance risks, and their entrepreneurial attitude improves daily. All emerging nations have women whose human capital is expanding as a consequence of their engagement in entrepreneurial endeavors and investments.
		Gender	122	121	
		Human Capital	12	10	
		Performance	11	20	
		Risk	43	59	
		Risk-taking	14	19	
3	Investment	Entrepreneur	24	30	Globally, there is a gender disparity in entrepreneurship and investment; the majority of high-investment entrepreneurs are males. Small and micro women's investments are long-lasting firms founded with innovation. Capital investment is one of the most effective strategies for women's entrepreneurship.
		Entrepreneurship	81	99	
		Gender Difference	12	6	
		Innovation	26	40	
		Investment	14	24	
		Venture capital	14	26	
4	Governance	Board of Directors	10	11	In Asian nations, women have a significant role on corporate boards of directors to control corporate governance. The finest corporate governance contributes to the improvement of community and national development.
		China	10	12	
		Corporate Governance	14	13	
		India	11	13	
5	SMEs	Microfinance	11	4	Microfinance is the most effective programme for empowering low-income family women. As a result of their participation in microfinance, women have become entrepreneurs, strengthening SMBs in all developing countries.
		SMEs	19	30	
		Women	71	90	
		Women Entrepreneur	50	39	

Discussion

Five decades (7 years of furcating results included) of the WEIR literature performance of the AD, AC, TD, and TCD up to 2029 have positive growth. The forecasted results represent positive aspects of WEIR literacy productivity. Highest cited documents published in the second decade (1993–2002); seventy per cent of documents are cited less than 25 times out of 599. The United Nations is the mother of WEIR literature and has published more documents, rising to third place in a short period compared to the top ten nations. The top ten institutions published 60 literature documents and 48.18 per cent of citations on WEIR literature progress. Yale University has a higher citation impact on TD and CD (162.4) than other institutions. The United States and Yale University are the first preferred authors for collaborative literature publication. Top ten authors, green, with 25 years of literature document journey, high

lifetime score, average annual citation for document, and top citation in percentage score. Authors preferred journal venture capital for the publication of literature on WEIR.

According to the Sustainability Cluster-1 analysis findings, the greater the value assigned to women's human capital in terms of education, the greater the value assigned to business and professional services (Siles, 2011). Women's entrepreneurship research on self-employment and sustainability after the pandemic is still developing; similarly, education impacts women's entrepreneurship and behavioural intention (Deng et al., 2020). Cluster-2, which represents a risk, is the second cluster on the output of cluster analysis results (LopezFernandez et al., 2016); the author keyword "gender" has higher co-occurrence (122) and total link (121) frequencies in WEIR. Risk-based research conducted by women entrepreneurs is trending in all countries regarding competitive performance, investment intention, finance mobilization, and human index status. 25. Fallah and Soori (2022) social acceptance and competitive environment taken risk for sustainable development by women entrepreneurs. The third clustering with the output which represents an investment. Current trending research on WEIR themes is on women entrepreneurs' investment preferences on innovation or new ventures, the gender difference between the entrepreneurship investment level, and the impact of women's education on venture capital investment (Jtrujano and Phiri, 2022). Women entrepreneurs get less finance worldwide. Recent study shows that institutional barriers and gender discrimination cause the entrepreneurial finance gender gap. Due to gender discrimination, gender lens investment has spread internationally. Investors worldwide are addressing this imbalance by investing in women-owned and -led enterprises (Jtrujano and Phiri, 2022). Cluster-4 represents governance practices on entrepreneurship by women; Gaio and Gonçalves, (2022) expressed in the research is on women's practices in corporate governance and the board of directors, as well as the governance management of women directors in India and China. Cluster-4 represents SMEs owned by women, and scholars worldwide look to women's entrepreneurship dominance as a current trend in microfinance, making this an essential tool within the broader academic and research domains related to SMEs (Kaushal et al., 2021).

The bibliometric analysis summary highlights existing research scope and gaps in WEIR, and the results provide potential paths for further research into women's entrepreneurial applications and sustainable management (Bang et al., 2022). As for the forecasting status, the application of women entrepreneurs' investment and risk management perspectives will be strengthened in the future, up to 2029. In particular, the application of entrepreneurial sustainability and education literature needs further attention because of the increasing number of women entrepreneurs.

Conclusion

This study used WEIR metadata to conduct a Scopus metadata analysis of existing developments literature, identify existing literature trends up to 2022 after forecasting up to 2029, and finally summarise a five-decade trend line of literature document and citation progress worldwide. Following an in-depth analysis of the contributions made by the leading nations, institutions, and writers to the literature document and citation score, the research adds five new topics to the WEIR of already-established research progress. According to the study's findings, a significant amount of additional research needs to be conducted in the areas of women's entrepreneurship-based sustainability; governance practises, SMEs' performance, investment, and risk scope to provide sufficient power to women, communities, and nations. Therefore, the study of WEIR should provide opportunities for constructing multi-faceted and multi-disciplinary perspectives and emphasize the cooperation between different sectors, fields, institutions, and nations to promote research and sustainable development. However, this paper has several limitations that can be addressed in future research. First, non-English language studies, editorial notes, and conference proceedings other than economics and business management disciplines were not included in the sample, even though they may add more value to some relevant findings and insights provided.

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