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Full Length Research Paper

Bibliometric analysis of financial crisis research

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The bibliometric analytical approach has not yet been applied in financial crisis research. The aim of the study was to apply bibliometric analysis to financial crisis publications in 362 journals listed in the four ISI subject categories of economics, finance business, business, and management in the Social Science Citation Index (SSCI). Analyzed parameters were publication language, document type, publication output, authorship, publication patterns, subject category distribution, region, country, publication institute, most frequently cited articles, and hot issues. This study demonstrates that the amount of research increased markedly during financial crises, especially during the Asian financial crisis and global financial crisis. Furthermore, the most frequently cited articles and topics associated with the currency crisis, policy, and banking crisis were popular during the Asian financial crisis and global financial crisis.

Key words: Scientometrics, crisis, research trend, web of science, SSCI.

INTRODUCTION

During a financial crisis, economies crash causing financial institutions and assets to lose a considerable amount of value. During the last two decades, America, Europe, and Asia experienced crises in their financial markets. For example, many countries in Latin American experienced a debt crisis during the 1980s (Kaminsky and Pereira, 1996). The USA experienced a Savings and Loan crisis in the late 1980s (Shoven et al., 1992). Mexico and Argentina experienced an economic crisis during 1994 - 1995 (Fratzscher, 1998; Kamin, 1999). Many countries in Asia experienced a financial crisis during 1997 - 1998 (Fratzscher, 1998; Kamin, 1999; Johnson et al., 2000). In the USA, the dot-com bubble burst during 1998 - 2000 (Ofek and Richardson, 2003). Global economies fell into an economic recession during 2007 - 2008 (Hornero, 2008; Buiter, 2008).

The term “bibliometric” was first coined by Fairthorne (1969) and Pritchard (1969). Bibliometric is the application of mathematics and statistical methods to books and other communication media. As common research tools for analyzing literature, bibliometric methods have been widely applied to assess scientific production and identify research trends in many disciplines (Zitt and Bassecoulard, 1994; Kostoff et al., 2007; Li et al., 2009). Through the utilization of bibliometric analysis, policy analysis has established itself as an important research area in French political science (Harguindéguy and Canton, 2009). Similar to many fields of research, the application of bibliometric analysis in the field of finance has been reported although in limited numbers. For instance, a bibliometric study on distributions and patterns of research output in the finance literature was published (Chung and Cox, 1990). In a recent publication, bibliometric evidence was used to illustrate the development of copula theory in mathematics, statistics, actuarial science, and finance (Genest et al., 2009). However, no bibliometric analysis has focused on financial crisis literature. Evaluating the performance of research topics is necessary to assess the impact and contribution of authors to their respective fields. Publications in a certain discipline can represent research trends.

This study analyzes financial crisis research performance using 4,644 documents published in the four Institutes for Scientific Information (ISI) subject categories

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of economics, finance business, business, and management in indexed periodicals in the Social Science Citation Index (SSCI) during 1992 - 2008. These documents were analyzed and evaluated according to publication distribution and were used to determine the performance and quantitative characteristics of financial crisis research. Additionally, this study also analyzed significant financial crisis publication patterns, especially in number of publications, growth trends of ISI subject categories, author country, author region, and institute of origin during financial crises. Finally, innovative method, source title, abstract, author keywords, keywords plus analysis, and trends in financial crisis research during 1992 - 2008 were used to analyze. This information will help researchers understand the scope of global financial crisis research and establish future research directions.

DATA SOURCES AND METHODOLOGY

Study data were obtained from the online version of the SSCI, the Web of Science. The SSCI is a multidisciplinary database generated by the ISI, Philadelphia, USA. According to Journal Citation Reports (JCRs), the ISI indexes 1,985 major journals with citation references across 56 scientific disciplines in 2008. In total, 362 journals listed in the four ISI subject categories of economics (n = 209), finance business (n = 48), business (n = 77), and management (n = 89) are considered in this study. Moreover, the online version of the SSCI was searched using the keywords “crisis” and “crises” as a part of a title, abstract, or keyword to compile a bibliography of all manuscripts related to financial crisis research. Articles originating from England, Scotland, Northern Ireland, and Wales were reclassified as from the United Kingdom (UK). Furthermore, the reported impact factor (IF) of each journal was obtained from the 2008 JCRs. Collaboration type was determined using author addresses. The term “single country” was assigned when all researchers were from the same country. The term “international collaboration” was used for articles that were coauthored by researchers from more than one country. The term “single institute” was assigned when researcher addresses were for the same institute. The term “inter-institute collaboration” was assigned to articles coauthored by researchers from more than one institute.

All articles referring to acculturation during 1992 - 2008 were assessed using the following characteristics: publication language; document type; authorship; characteristics of publications output during 1992 - 2008; distribution of output in journals and subject categories; publication output by region, country, and institute; most frequently cited articles; and, hot topic analysis.

RESULTS AND DISCUSSION

Distribution of document type

The document type identified by the ISI was analyzed. This analysis found 14 document types. Table 1 shows the document type distribution. Article (3,323) was the most frequently used document type, accounting for 72% of total production, followed distantly by book reviews and proceedings papers; the other less common document types were editorial material, reviews, letters, meeting abstracts, news items, corrections, notes, biographical items, discussions, additions and corrections, and reprints. In total, 3,323 articles, the most common document type, were analyzed.

Language distribution

Thirteen languages were identified. The most common language was English, followed distantly by Spanish, French, Czech, German, Slovak, Russian, Swedish, Danish, Finnish, Korean, Portuguese, and Polish (Table 1). English remains the dominant language in several fields (Chiu and Ho, 2005; Li et al., 2009). English was likely the dominant language because the majority of journals listed in the ISI are published in English (Van Leeuwen et al., 2001).

Publication output

Over the last 17 years, the annual number of articles devoted to crisis research has increased markedly. The number of articles increased to 173 in 1998 from 95 in 1997 (the period of the Asian financial crisis), and increased to 407 in 2008 from 330 in 2007 (the global financial crisis period) (Table 2) . The average number of authors per article increased to 1.9 authors per article in 2008 from 1.4 in 1992. The average article length fluctuated slightly, with an overall average length of 20 pages. The average number of cited references per article rose to 35 in 2008 from 23 in 1992. Kaminsky and Reinhart (1999) suggested that the issue of financial crises garnered the attention of academia after the Asian currency crisis. The number of articles increased markedly during this financial crisis. The growth rate of articles was 82% during the Asian financial crisis (1998) and 23% during the global financial crisis (2008). Hence, after a financial crisis occurred, this issue garnered considerable attention. Various studies have indicated that major events influence publication patterns. Chiu et al. (2004) showed that the Severe Acute Respiratory Syndrome (SARS) publication pattern in the beginning stage suggested immediate citation, had a low collaboration rate, and English was the dominant language. Chiu and Ho (2007) used the bibliometric analytical technique to examine tsunami research. Their analysis indicated that most tsunami studies were published in journals with high IFs in the first 8 months after the Indonesia tsunami on December 26, 2004.

Authorship

By identifying the backgrounds of authors, one can identify the experts in the issue of financial crisis. An analysis of authors’ total publications, the first author, and their

Table 1. Pattern of the distribution of language of publications and document type.

Language	English	Spanish	French	Czech	German	Slovak	Others	Total (%)
Article	3,057	106	47	39	19	17	38	3,323 (72)
Book review	504	7	2	10	5	2	1	531 (11)
Proceedings paper	454	10	12	3			1	480 (10)
Editorial material	151	2		3	1		1	158 (3.4)
Review	87	1	3			1		92 (2.0)
Letter	25							25 (0.54)
Meeting abstract	14							14 (0.30)
News item	7							7 (0.15)
Correction	4	1						5 (0.11)
Note	3	1						4 (0.086)
Biographical-item	2							2 (0.043)
Discussion	1							1 (0.022)
Addition correction	1							1 (0.022)
Reprint		1						1 (0.022)
Total	4,310	129	64	55	25	20	41	4,644
(%)	(93)	(2.8)	(1.4)	(1.2)	(0.54)	(0.43)	(0.22)	(100)

Table 2. Characteristics by year of publication outputs from 1992 - 2008.

Year	TP (%)	G%	AU	AU/TP	PG	PG/TP	NR	NR/TP
1992	98 (2.9)		142	1.4	1,563	16	2,302	23
1993	106 (3.2)	8.2	159	1.5	1,814	17	2,744	26
1994	88 (2.6)	-17	128	1.5	1,523	17	2,436	28
1995	101 (3.0)	15	138	1.4	1,749	17	3,212	32
1996	115 (3.5)	14	188	1.6	2,062	18	3,017	26
1997	95 (2.9)	-17	164	1.7	1,884	20	2,615	28
1998	173 (5.2)	82	275	1.6	3,342	19	5,163	30
1999	222 (6.7)	28	342	1.5	4,302	19	6,231	28
2000	230 (6.9)	3.6	384	1.7	4,626	20	6,885	30
2001	207 (6.2)	-10	358	1.7	4,299	21	6,119	30
2002	206 (6.2)	-0.5	380	1.8	4,395	21	6,559	32
2003	202 (6.1)	-1.9	334	1.7	4,105	20	6,976	35
2004	229 (6.9)	13	407	1.8	4,877	21	8,116	35
2005	241 (7.3)	5.2	422	1.8	4,952	21	8,246	34
2006	273 (8.2)	13	547	2.0	5,918	22	9,746	36
2007	330 (10)	21	618	1.9	6,776	21	11,407	35
2008	407 (12)	23	760	1.9	7,362	18	14,365	35
Total	3,323 (100)		5,746		65,549		106,139	
Average				1.7		20		32

TP: Number of publications; G%: growth rate; AU: Number of authors; PG: Page count; NR: Cited reference count; PG/P, NR/P, and AU/P: average of pages, references, and authors in a paper.

corresponding publications was undertaken. Table 3 lists the top 24 most productive (total publications > 5) authors during 1992 - 2008. The 3,314 manuscripts with author information had 5,746 authors. Therefore, 9 articles were omitted from subsequent author analysis. Schmukler, the most productive researcher, authored 13 manuscripts, followed by Demirguc-Kunt with 11, Detragiache with 10, Eichengreen with 10, and Rosengren with 10. Eichengreen published the highest number of articles as first author and corresponding author. A bias can exist in

Table 3. The 24 most-productive (total publications > 5) authors, first authors, and corresponding authors between 1992 and 2008.

Author	TPR (TP)	FAR (FAP)	RPR (RP)
Schmukler, SL	1 (13)	99 (2)	16 (4)
Demirguc-Kunt, A	2 (11)	1 (9)	2 (8)
Detragiache, E	3 (10)	37 (3)	36 (3)
Eichengreen, B	3 (10)	1 (9)	1 (9)
Rosengren, ES	3 (10)	360 (1)	334 (1)
Rajan, RS	6 (9)	9 (5)	7 (5)
Corsetti, G	6 (9)	9 (5)	16 (4)
Aizenman, J	8 (8)	3 (7)	36 (3)
Peek, J	8 (8)	3 (7)	3 (7)
Mishkin, FS	8 (8)	3 (7)	3 (7)
Kaminsky, GL	11 (7)	3 (7)	3 (7)
Flood, RP	11 (7)	8 (6)	88 (2)
Reinhart, CM	11 (7)	N/A	88 (2)
Miller, V	11 (7)	3 (7)	3 (7)
Lee, JW	11 (7)	99 (2)	7 (5)
Jeanne, O	11 (7)	19 (4)	7 (5)
Johnson, S	11 (7)	19 (4)	7 (5)
Claessens, S	18 (6)	9 (5)	16 (4)
Spagnolo, N	18 (6)	N/A	N/A
Tornell, A	18 (6)	99 (2)	88 (2)
Gelos, RG	18 (6)	19 (4)	16 (4)
Jordan, JS	18 (6)	9 (5)	7 (5)
Hill, H	18 (6)	N/A	334 (1)
Yeyati, EL	18 (6)	19 (4)	36 (3)

TPR (TP): the rank and total publications; FAR (FAP): the rank and publications of the first author; RPR (RP): the rank and publications of the corresponding author; N/A: not applicable.

authorship analysis when any two or more authors have the same name, or when authors used different names in their publications (e.g., name changes due to marriage). Moreover, authors may work at different institutions or in different countries over time or within the same period, thereby increasing the difficulty in analyzing authorship. Therefore, we strongly recommended that an international identity number (IIN) be assigned to each author when first publishing a paper in a journal listed in the ISI (Ho, 2007).

Publication patterns

By studying the characteristics of publications, one can understand who, in the management field, focused on financial crisis issues most, identify the IF of journals, and rank the publications. Such statistics would increase the convenience associated with the research in post-financial crises. In 2008, the JCRs of the ISI contained 1,985 major journals listed in the SSCI. In total, 3,323 articles were published in 404 journals listed in ISI subject categories of economics, finance business, business, and management. Of these 404 journals, 101 (3.0%) contained only 1 publication, 53 (3.2%) contained 2 publications, and 35 (3.2%) journals contained 3 publications. Table 4 lists the 10 most productive journals and their IFs, the ISI category of the journal, position of the journal in its category, number of papers, and percentage of total publications. In total, 640 articles (19%) were published in the 10 most productive journals listed in the SSCI. *World Development* published the most manuscripts, followed by Journal of International Money and Finance, Public Relations Review. The IF of a journal is defined by the JCR, and is derived by dividing the number of current citations in articles published in the 2 previous years by the total number of articles published in the 2 previous years. Notably, IF is a measure of the frequency with which an average article in a journal has been cited in a particular year. The IF is utilized to evaluate the relative importance of a journal, especially when compared to others in the same field. The distribution of publications by reference to their IF issued in 2008 was as follows: 0.90% of all publications had an IF > 5, 2.9% had an IF of 3 - 5, 32% had an IF of 1 - 3, 53% had an IF of 0 - 1 and 11% had no information for the IF.

Table 4. The 10 most -active journals with the number of articles, impact factor (IF), ISI category of journals, and the position of the journal in its category.

Journal	TP (%)	IF	ISI category	Position
World Development	100 (3.0)	1.392	Economics	21/191
			Planning and development	5/38
Journal of International Money and Finance	92 (2.8)	0.860	Finance business	27/45
Public Relations Review	92 (2.8)	0.507	Business	69/72
			Communication	41/45
Bulletin of Indonesian Economic Studies	59 (1.8)	1.276	Economics	72/191
Applied Economics	58 (1.7)	0.430	Economics	124/191
Harvard Business Review	52 (1.6)	1.793	Business	23/72
			Management	34/81
Journal of Banking and Finance	50 (1.5)	0.997	Finance business	22/45
			Economics	82/191
Desarrollo Economico-Revista de Ciencias Sociales	49 (1.5)	0.073	Economics	191/191
IMF Staff Papers	45 (1.4)	0.510	Finance business	40/45
			Economics	157/191
Journal of International Economics	43 (1.3)	1.724	Economics	25/191

TP: total publications; IF: Impact factor.

The journal with the highest IF (5.826) was MIS Quarterly.

Distribution of subject category

Subject categories of economics, finance business, business, and management in crisis-related articles were statistically analyzed (Figures 1 and 2). The number of articles in the economics and finance business categories increased markedly during the financial crisis period covered.

In different fields, the number of publications related to a financial crisis increased noticeably, especially in the categories of economics and finance business. The growth rate for articles in the category of economics (finance business) reached 100% (92%) during the Asian financial crisis and reached 17% (61%) during the global financial crisis. Moreover, 2,304 articles (69%) were published in the category of economics, 642 (19%) in the category of finance business, 485 (15%) in the category of business, and 436 (13%) in the category of management. Therefore, in these four fields, the economics category accounted for the most publications. Among the many topics, some were more popular than others. For instance, Kostoff et al. (2007) examined the publication bibliometrics of both global nanoscience and nanotechnology (N and N). They determined that the number of N and N research publications grew exponentially for more than a decade. Li et al. (2009) indicated that stem -cell research has increased steadily and been published in various categories. The three most common categories were hematology, oncology, and cell biology.

Region of publication

According to Eichengreen et al. (1996) and Glick and Rose (1999), currency crises pass contagiously from one country to another and affect all countries in geographic proximity. Consequently, a financial crisis can affect huge regions. Thus, the geographic distribution of publications was also broad. In total, 3,061 (92%) articles with author addresses on the ISI Web of Science were analyzed. Figures 3 and 4 show analytical results. Of the 3,061 articles, 1,684 were from America (55%), 1,117 were from Europe (37%), 448 were from Asia (15%), 162 were from Oceania (5.3%), and 34 were from Africa (1.1%). Therefore, the regions the crisis impacted accounted for the highest numbers of crisis-related publications. Publications from America, Europe, and Asia during the Asian financial crisis (1997 - 1998) increased rapidly. Although the Asian financial crisis originated in Asian countries, researchers presented their work in Western countries to attract attention from American and European scholars. In other words, presentations of published work are not limited to the regions in which researchers reside. Major economic events occur worldwide and are good topics for research using global perspectives. After the Asian financial crisis, the number of publications from America and Europe declined slightly, but increased again in 2003, particularly during the global financial crisis (2007

- 2008). Additionally, the number of publications from Asiagrew slowly after the Asian financial crisis, but increased rapidly during the global financial crisis. In the three continents that were hardest hit by the financial crisis, the number of publications related to the financial crisis increased noticeably. This finding is consistent with the

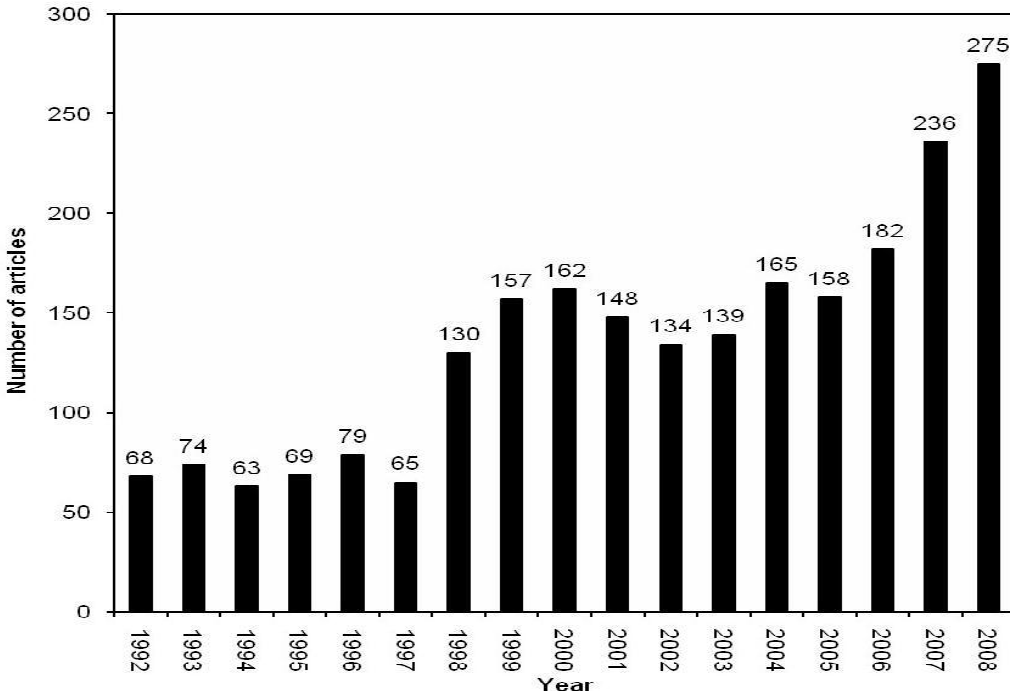

Figure 1. The growth trends of subject categories containing economics above crisis related articles during 1992 - 2008.

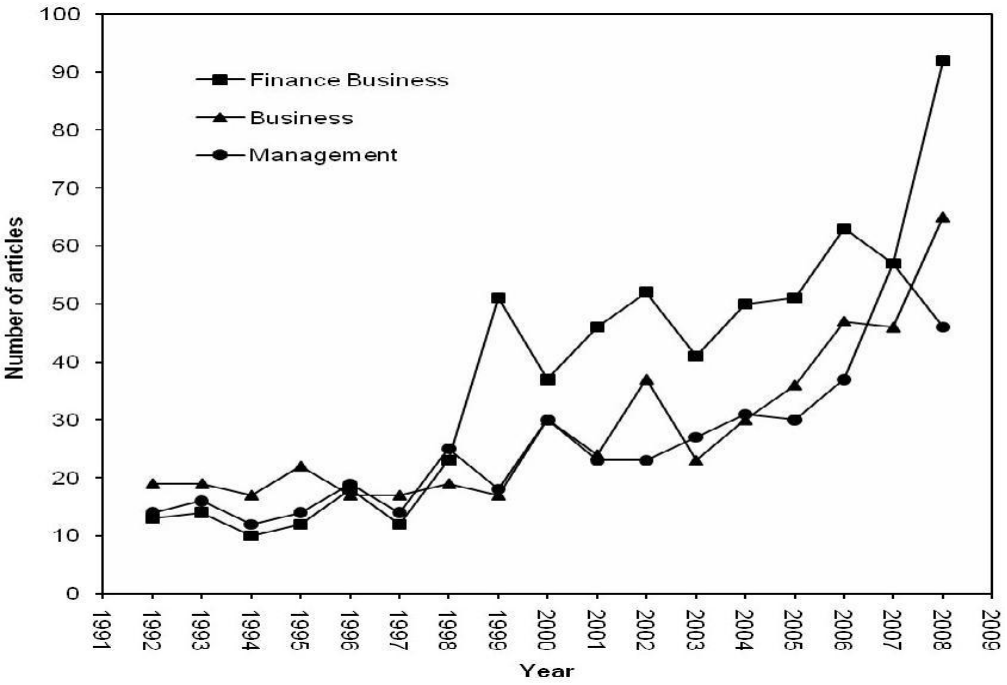

Figure 2. Comparison the growth trends of subject categories containing finance business, business, and management above crisis related articles during 1992 - 2008.

conclusions obtained by Chiu et al. (2004) and Chiu and Ho (2007), indicating that specific events influence publication patterns.

Countrywide publication

Table 5 lists the 40 most productive countries during 1992

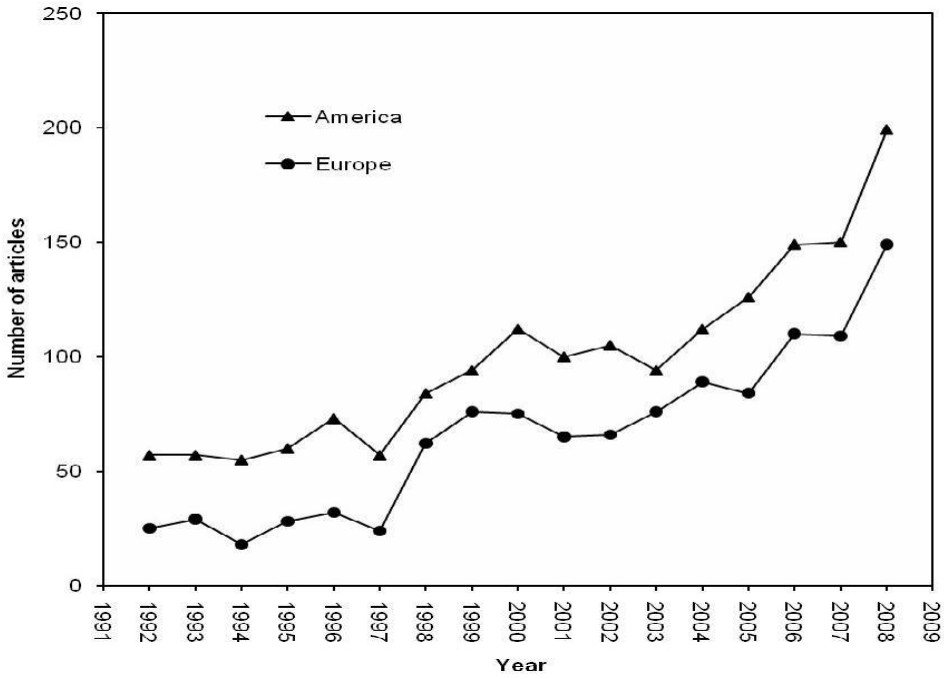

Figure 3. Publication distribution of America and Europe during 1992 – 2008.

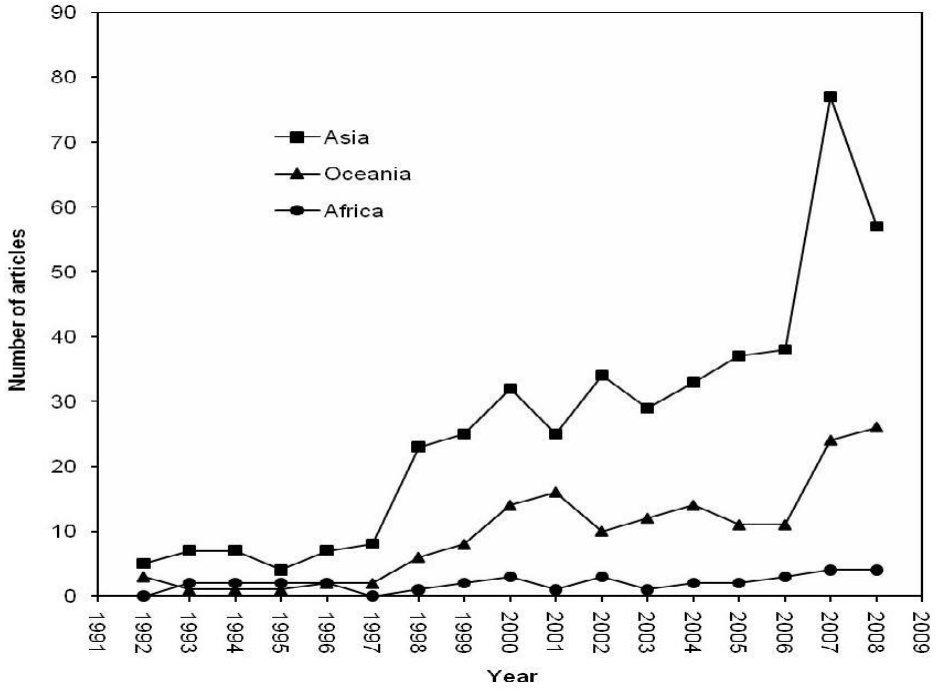

Figure 4. Publication distribution of Asia, Oceania, and Africa during 1992 - 2008.

- 2008. Among the 3,061 articles with author addresses published during 1992 - 2008, 2,499 (82%) were independent publications and 562 (18%) were international collaborations. These publications came from 88 countries, with most originating from the US (1,471; 48%) and UK (416; 14%). The seven major industrial countries (G7: Canada, France, Germany, Italy, Japan, the UK, and the USA) were ranked in the top 15

Table 5. The 40 most-productive countries of activities during 1992 - 2008.

Country	TP	TPR (%)	IPR (%)	CPR (%)
USA	1,471	1 (48)	1 (46)	1 (59)
UK	416	2 (14)	2 (11)	2 (27)
Australia	140	3 (4.6)	4 (3.6)	4 (8.7)
France	134	4 (4.4)	3 (3.8)	7 (6.9)
Canada	127	5 (4.1)	5 (3.2)	6 (8.2)
Germany	126	6 (4.1)	6 (3.2)	5 (8.4)
South Korea	99	7 (3.2)	8 (1.8)	3 (10)
Japan	74	8 (2.4)	7 (2.2)	16 (3.2)
Spain	67	9 (2.2)	8 (1.8)	12 (4.1)
Netherlands	62	10 (2.0)	12 (1.2)	9 (5.5)
Hong Kong	60	11 (2.0)	20 (0.84)	7 (6.9)
Turkey	56	12 (1.8)	10 (1.4)	14 (3.7)
Italy	47	13 (1.5)	15 (1.0)	14 (3.7)
Singapore	46	14 (1.5)	22 (0.80)	10 (4.6)
Argentina	45	15 (1.5)	11 (1.3)	20 (2.3)
Switzerland	44	16 (1.4)	20 (0.84)	12 (4.1)
Russia	41	17 (1.3)	16 (1.0)	17 (3.0)
Taiwan	41	17 (1.3)	12 (1.2)	22 (1.8)
Indonesia	37	19 (1.2)	32 (0.44)	10 (4.6)
Sweden	34	20 (1.1)	16 (1.0)	22 (1.8)
Finland	31	21 (1.0)	18 (0.92)	28 (1.4)
Mexico	31	21 (1.0)	25 (0.60)	18 (2.8)
Israel	30	23 (1.0)	25 (0.60)	19 (2.7)
Czech Republic	30	23 (1.0)	14 (1.1)	40 (0.36)
Slovakia	27	25 (0.88)	18 (0.92)	37 (0.71)
Brazil	26	26 (0.85)	24 (0.64)	22 (1.8)
Philippines	25	27 (0.82)	23 (0.68)	28 (1.4)
South Africa	22	28 (0.72)	27 (0.56)	28 (1.4)
Belgium	22	28 (0.72)	31 (0.48)	22 (1.8)
New Zealand	21	30 (0.69)	27 (0.56)	32 (1.2)
Chile	20	31 (0.65)	32 (0.44)	27 (1.6)
Denmark	20	31 (0.65)	29 (0.52)	32 (1.2)
Ireland	18	33 (0.59)	35 (0.40)	28 (1.4)
China	17	34 (0.56)	37 (0.28)	22 (1.8)
Thailand	16	35 (0.52)	43 (0.16)	21 (2.1)
Greece	15	36 (0.49)	35 (0.40)	35 (0.89)
Hungary	15	36 (0.49)	29 (0.52)	40 (0.36)
Austria	14	38 (0.46)	32 (0.44)	38 (0.53)
India	12	39 (0.39)	37 (0.28)	35 (0.89)
Norway	11	40 (0.36)	39 (0.20)	34 (1.1)

TP: Total publications; TPR (%): the rank and percentage of total publications; IPR (%): the rank and percentage of single country publications; CPR (%): the rank and percentage of international collaboration publications.

countries for publications. The G7 group had the highest productivity, accounting for 2,395 (78% of 3,061) publications. In Asian countries, most articles originated from South Korea (7; 3.2%), even more than from Japan. During the Asian financial crisis and global financial crisis, South Korea experienced a crash in its financial markets and, therefore, South Korean scholars started investigating investigating the issue. Some researchers investigated

Table 6. The 29 most-productive (total publications > 20) institute of activities during 1992 - 2008.

Institute	TP	TPR (%)	IPR (%)	CPR (%)
International Monetary Fund, USA	134	1(4.4)	1 (3.4)	2 (5.6)
National Bureau of Economic Research (NBER), USA	100	2(3.3)	286 (0.058)	1 (7.4)
World Bank, USA	96	3(3.1)	2 (1.6)	3 (5.1)
Harvard University, USA	62	4(2.0)	4 (1.1)	4 (3.2)
Australian National University, Australia	47	5(1.5)	3 (1.4)	13 (1.6)
Massachusetts Institute of Technology, USA	44	6(1.4)	9 (0.64)	5 (2.5)
New York University, USA	43	7(1.4)	6 (0.81)	6 (2.2)
University of California, Berkeley, USA	36	8(1.2)	5 (1.0)	17 (1.3)
Columbia University, USA	35	9(1.1)	13 (0.52)	7 (1.9)
University of Maryland, USA	31	10 (1.0)	35 (0.35)	9 (1.9)
University of Michigan, USA	31	10 (1.0)	35 (0.35)	9 (1.9)
Korea University, South Korea	29	12(0.95)	97 (0.17)	7 (1.9)
National University of Singapore, Singapore	29	12(0.95)	13 (0.52)	14 (1.5)
University of Pennsylvania, USA	28	14(0.91)	13 (0.52)	16 (1.4)
University of California, Los Angeles, USA	28	14(0.91)	43 (0.29)	11 (1.7)
University of Texas, USA	27	16(0.88)	10 (0.58)	21 (1.3)
University of Oxford, UK	26	17(0.85)	20 (0.46)	17 (1.3)
Hong Kong University of Science and Technology, Hong Kong	25	18(0.82)	158 (0.12)	11 (1.7)
Fed Reserve Bank of Boston, USA	25	18(0.82)	8 (0.70)	33 (1.0)
Stanford University, USA	24	20(0.78)	25 (0.41)	21 (1.3)
University of Cambridge, UK	24	20(0.78)	13 (0.52)	27 (1.1)
Cornell University, USA	23	22(0.75)	43 (0.29)	17 (1.3)
University of Missouri, USA	23	22(0.75)	97 (0.17)	14 (1.5)
Northwestern University, USA	21	24(0.69)	25 (0.41)	30 (1.0)
University of Adelaide, Australia	21	24(0.69)	25 (0.41)	30 (1.0)
University of California, Santa Cruz, USA	20	26(0.65)	66 (0.23)	24 (1.2)
Princeton University, USA	20	26(0.65)	10 (0.58)	43 (0.75)
University of Manchester, UK	20	26(0.65)	25 (0.41)	33 (1.0)

TP: Total publications; TPR (%): the rank and percentage of total publications; IPR (%): the rank and percentage of single institute publications; CPR (%): the rank and percentage of inter-institute collaboration publications

reasons for the Korean crisis reason after the financial crisis. Choe et al. (1999) examined the impact of foreign investors on stock returns in Korea from November 30, 1996, to the end of 1997. They found no evidence that trades by foreign investors destabilized Korea's stock market. This analytical result again reinforces the assertion that financial crises affect publication patterns. Moreover, 19 countries had no internationally collaborative articles and 21 countries had no independent articles.

Nineteen (0.92%) countries contributed only 1 or 2 independent publications, and 28 (6.4%) countries accounted for only 1 or 2 internationally collaborative publications. The USA accounted for the most independent articles at 46% of all independent publications, followed by the UK with 11%. The USA was also the most frequent partner, accounting for 59% of internationally collaborative publications, followed by the UK with 27%.

Institute-wise publication

Table 6 lists the 29 most productive (total publications > 5) institutes during 1992 - 2008. Among the 3,061 articles with author addresses, 1,725 (56%) were single-institute publications and 1,336 (44%) articles were inter-institute collaborations. As the largest economic body, the USA focused on issues related to financial crises. The International Monetary Fund accounted for the highest number of articles from the USA (134; 4.4%), followed by the National Bureau of Economic Research (NBER) (100; 3.3%) and World Bank (96; 3.1%). That is, the most productive institutes were in the USA, accounting for 2,215 (72% of 3,061 articles) publications. Korea University (29; 0.95%) and the National University of Singapore (29; 0.95%) were ranked top one in Asia for publications. South Korea experienced an economic crisis during the Asian financial crisis and global financial crisis. Twenty-seven (93% of 29) publications from the Korea

University focused on the topic of financial crisis after the Asian financial crisis. The International Monetary Fund in the USA had the most independent articles at 3.4% of all independent publications, followed by the World Bank in the USA at 1.6%. The NBER in the USA was the most frequent partner, accounting for 7.4% of inter-institute publications, followed by International Monetary Fund in the USA with 5.6%. Although the NBER was the most frequent partner, it accounted for a very low percentage of single-institute publications.

Most frequently cited articles

The total citation count was obtained from the Web of Science, which lists the total number of times a particular article is cited by all journals in the database. The number of citations does not indicate article quality, but rather is a measure of its impact or visibility. Table 7 lists the 10 most frequently cited articles. Among these crisis-related articles, the most frequently cited was "the twin crises: the causes of banking and balance-of-payments problems". This manuscript by Kaminsky and Reinhart was published in 1999 in the *American Economic Review.* This article had an IF of 2.285 and was cited 295 times during 1999 - 2008. Kaminsky and Reinhart authored 7 articles. Kaminsky was recorded on these 7 articles as first author or corresponding author. Figure 5 shows the relationship between article life and times cited each year for the most frequently cited article. The number of times the article was cited rose suddenly in the beginning year and peaked during the global financial crisis (2007 - 2008). This article is a highly impact reference when studying the topic of financial crisis. Kaminsky and Reinhart (1999) systematically analyzed the links between banking and the currency crisis in their study. They determined that problems in the banking sector typically precede a currency crisis and the currency crisis deepens the banking crisis.

Hot issues

Studying hot issues allows one to identify the issues that garner the most attention and discussion. Notably, it can be used as reference for future research. The bibliometric method is an effective tool for identifying such issues. The bibliometric method has been applied for author keywords analysis in recent years (Chiu and Ho, 2007). Source titles and author keywords reasonably reflect article subjects (Li et al., 2009). Keywords plus provide search terms extracted from manuscript titles cited in each new article in the ISI database (Garfield, 1990). Keywords plus analysis is an independent supplement, revealing article content in great detail (Li et al., 2009). Moreover, no study has applied the bibliometric analytical technique to abstracts, even though subject and research direction can be acquired from abstracts. Statistical analysis of keywords may focus on discovering directions of scientific research, and is important for monitoring developments in science. To identify hot issues in financial crisis research, frequently used words in titles, abstracts, author keywords and keywords plus analysis were analyzed. Each hot word includes its singular and plural form; for instance,

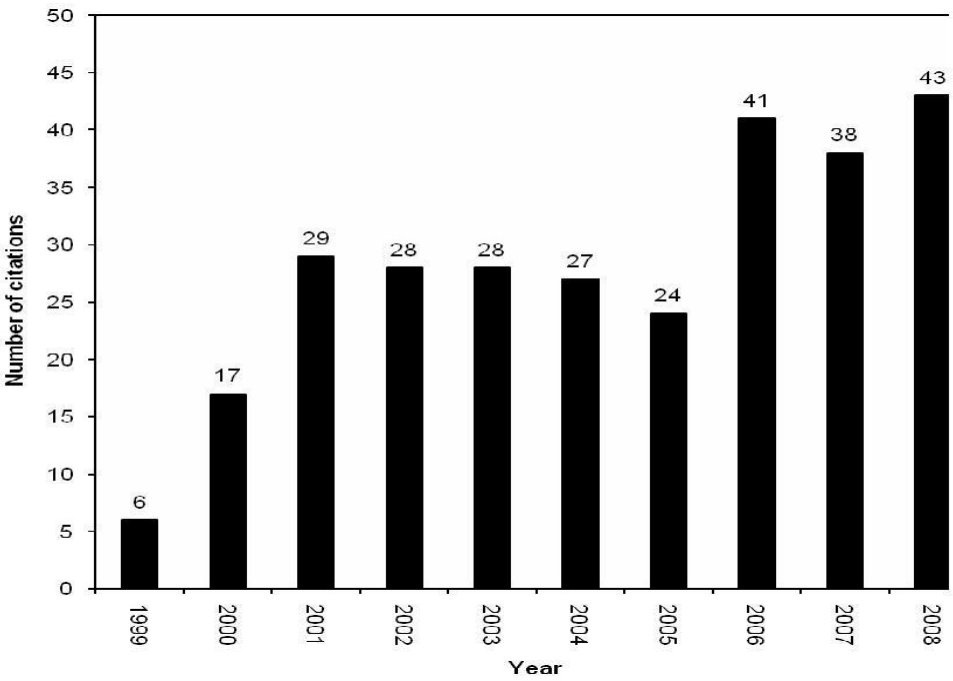

Figure 5. Citation history of the most-frequently cited article.

financial crisis encompasses “financial crisis” and “financial crises”. In total, 3223 articles with title records in the SSCI database were analyzed. In the ISI Web of Science, 283 (8.5%), 1,910 (57%), and 1,277 (38%) articles lacked an abstract, author keywords, and keywords plus information, respectively. Thus, not all 3,323 articles were included in each analysis. The most frequently used hot words in titles, abstracts, author keywords, and keywords plus were analyzed. “Financial crisis” was the most frequently used keyword, used 180 times in titles, 469 times in abstracts, 154 times in author keywords, and 76 times in keywords plus. The next hottest issues were “currency crisis” and “banking crisis”. Most hot words, including “financial crisis” (53%), “currency crisis” (38%), “banking crisis” (51%), “economic crisis” (73%), “debt crisis” (53%), and “crisis management” (51%), appeared in abstracts. Nevertheless, the relative percentage that “payments crisis” appeared in keywords plus was highest.

To study global trends in financial crisis research, three issues during 1992 - 2008 were examined. The first issue, “currency”, encompasses the phrases “currency crisis”, “currency crises”, “exchange rate”, and “exchange rates”; the second issue, “banking”, encompasses the phrases “banking crisis” and “banking crises”; and the last issue, “policy”, encompasses the words “policy” and “politics” in titles, abstracts, author keywords, and keywords plus. These three issues were statistically analyzed (Figure 6). The frequencies at which these three issues increased rapidly after the Asian financial crisis and peaked during the global financial crisis. However, “banking” was used far less than “currency” and “policy”. Researchers focused most on “policy”. In the wake of the Mexican and Asian currency crises, the subject of financial crises moved to the forefront of academic and policy discussions (Kaminsky and Reinhart, 1999).

Conclusion

This study of papers in the SSCI that dealt with financial crises obtained some significant findings regarding research performance during 1992 - 2008. English was the dominant language, accounting for 93% of all articles. The number of articles increased markedly during the financial crisis periods covered. The growth rate of articles reached 82% during the Asian financial crisis and reached 23% during the global financial crisis. Hence, after a financial crisis occurred, the issue of research garnered increased attention. The journal World Development accounted for the highest number of published articles. The G7 countries had the highest productivity for the topic of crisis, with the USA accounting for the highest number of publications. In Asia, most articles originated from South Korea, not Japan. The number of publications from America, Europe, and Asia increased rapidly during the Asian and global financial crisis, particularly during the Asian financial crisis and global financial crisis. The

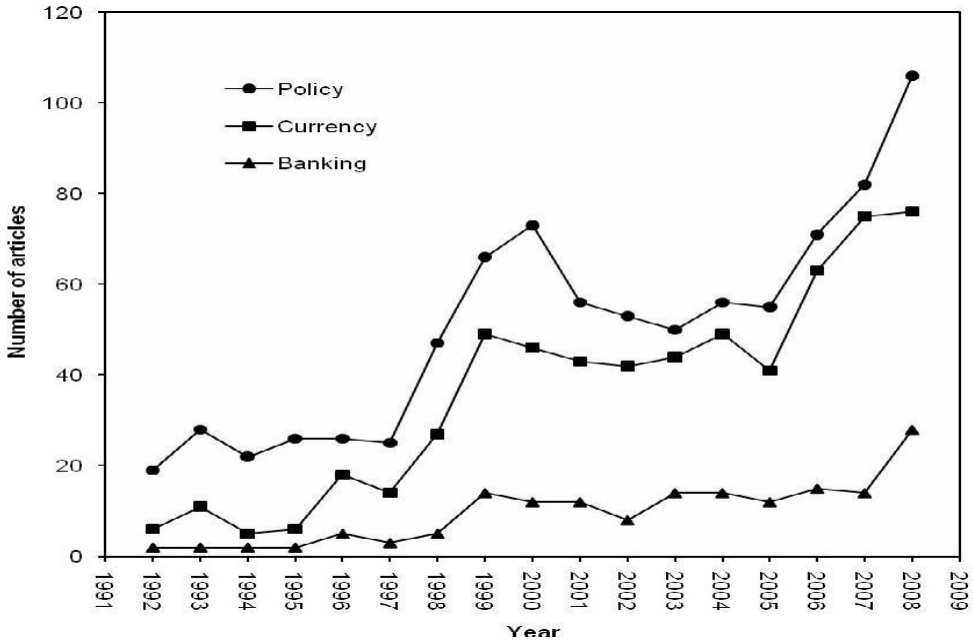

Figure 6. Comparison the growth trends of the “currency”, “policy”, and “banking” groups.

Table 7. Hot word used from the frequency of title, abstract, author keywords, and keywords plus.

Hot issue	Title TP (%)	Abstract TP (%)	Author keywords TP (%)	Keywords plus TP (%)
Financial crisis	180 (20)	469 (53)	154 (18)	76 (8.6)
Currency crisis	132 (25)	205 (38)	130 (24)	67 (13)
Banking crisis	55 (25)	114 (51)	45 (20)	8 (3.6)
Economic crisis	50 (20)	184 (73)	19 (7.5)	N/A
Debt crisis	29 (20)	78 (53)	16 (11)	23 (16)
Crisis management	23 (18)	67 (51)	35 (27)	6 (4.6)
Crisis communication	23 (29)	30 (38)	27 (34)	N/A
Organizational crisis	11 (26)	23 (53)	5 (12)	4 (9.3)
Payments crisis	10 (6.5)	28 (18)	12 (7.7)	105 (68)
Liquidity crisis	9 (23)	24 (62)	5 (13)	1 (2.6)
Exchange rate crisis	8 (26)	18 (58)	5 (16)	N/A
Twin crisis	5 (26)	7 (37)	4 (21)	3 (16)
Capital account crisis	1 (20)	1 (20)	3 (60)	N/A
Crisis prediction	N/A	N/A	6 (100)	N/A

TP: The publications; %: the relative percentage to other sources; N/A: not applicable.

International Monetary Fund in the USA accounted for the most articles and the most independent articles. The most frequently cited article was “the twin crises: the causes of banking and balance-of-payments problems” during 1999 - 2008. The number of times this article was cited rose suddenly in the beginning of the published year and peaked during the global financial crisis. By synthetically analyzing the distribution of and changes to source titles, abstracts, author keywords (Table 8), and keywords plus, this study described the development of financial crisis research during 1992 - 2008, and predicted the future directions of financial crisis research. The frequencies with which “policy”, “currency crisis”, and “banking crisis” appeared in titles, abstracts, author keywords, keywords plus increased rapidly after the Asian financial crisis an d peaked during the global financial crisis. The topics currency crisis, policy, and banking crisis were popular during financial crises.

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