

025-0639 - Social networks and cooperation: A bibliometric study

Ana Paula Lopes, Escola Politécnica da Universidade de São Paulo, Av. Prof. Almeida Prado, Travessa 2, Nº 128 Cidade Universitária - São Paulo – SP, aplopes10@hotmail.com, Phone.: +55 11 3091-5363

Marly Monteiro de Carvalho, Escola Politécnica da Universidade de São Paulo, Av. Prof. Almeida Prado, Travessa 2, Nº 128 Cidade Universitária - São Paulo – SP, marlymc@usp.br, Phone.: +55 11

3091-5363

POMS 23rd Annual Conference

Chicago, Illinois, U.S.A.

April 20 to April 23, 2011

Abstract: The literature of social networks has changed over time. Some theoretical pillars that justify this increased interest are grounded in the concept of transaction costs and capital. The main objective of this research is to analyze the social network theory. The research method used was the bibliometric study with content.

1. INTRODUCTION

The literature on social networks has changed over time. According to Wasserman and Faust (1994), the social network analysis involves social and behavioral science. Some theoretical pillars that justify this increased interest is grounded in the concept of transaction costs and social capital.

By rescuing the study of Coase (1937), Williamson (1985) brought to the forefront of research topics related to resources allocated in the coordination of economic activities in the markets.

The decentralization of production activities, highlighted by Chesnais (1996) as the formation of "network companies" as a result of the downsizing of large corporate structures of the past, marked by subcontracting (outsourcing) and alliances, shows the importance of this topic.

As a result, Dean and Kretschmer (2007) argue that economic thought has been yielding evidence that the concept of capital is not only linked to the production and work, but also the relationships (social capital) and ideas (intellectual capital). In this context, given the complexity and speed of innovation, it is increasingly necessary to be networked (Carvalho, 2009). The main

objective of this study is to analyze the literature of social networking and cooperation.

2. RESEARCH METHOD

The research method used in this study is the bibliometric study with content analysis. According to Neely (2005), the focuses of bibliometric research are the authors studied through citation analysis, co-citation and references. For Prasad and Tata (2005), the bibliometric study allows you to organize the literature, periodicals and identifying areas of emphasis.

2.1. Sample

The initial sample of work was obtained by using the keywords "social network" and "cooperation" in the database ISI Web of Science, resulting in 161 works. Was used as a filter to select only articles, decreasing to 101 the number of jobs. The study period was from 1987 to 2010. Figure 1 shows the workflow of the articles.

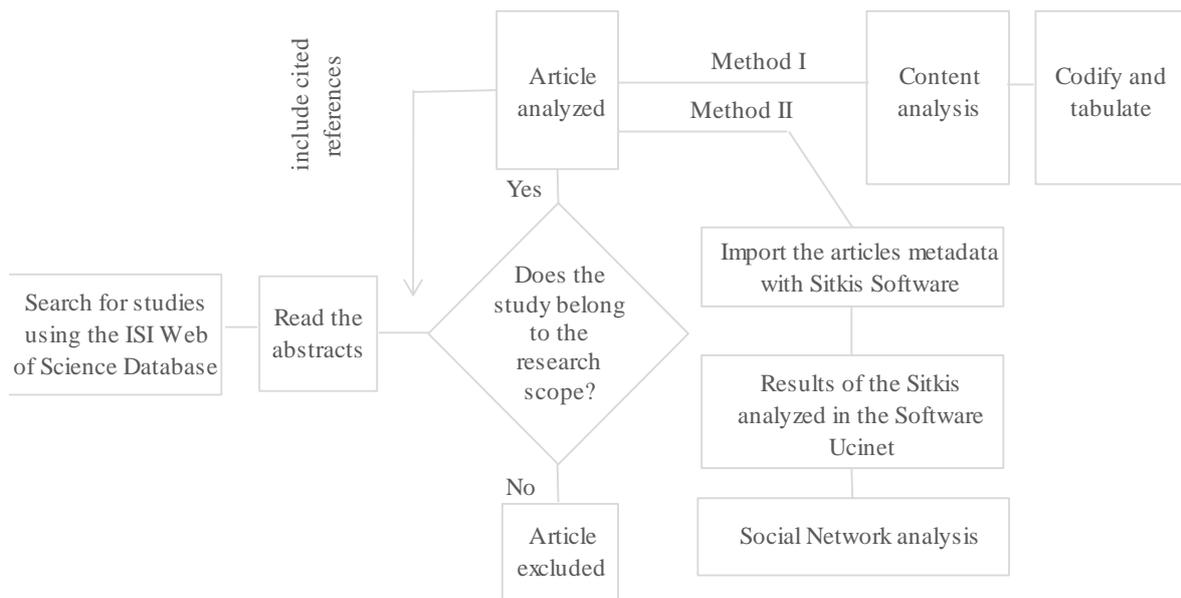


Figure 1. Workflow of the articles.

3. RESULTS

The following sections present the main results of the survey.

3.1. Journals and areas

Table 1 shows the number of publications per journal and year.

Tabela 1
Publications per journal and year.

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Total
ACM Transactions on Autonomous and Adaptive Systems																								1	1
Administration & Society																		1							1
Advances in Complex Systems																							1		1
Advances in Services Marketing and Management									1																1
Ai Communications																			1						1
American Journal of Sociology													1						1						2
American Politics Research														1									1	1	2
American Review of Public Administration																								1	1
Animal Behaviour																						1		1	2
Annales de Cardiologie et D Angeiologie																			1						1
Annales Zoologici Fennici																				1					1
Annals of the American Academy of Political and Social Science																1									1
Applied Mathematics and Computation																				1					1
Arbor-Ciencia Pensamiento y Cultura																				1			1		1
Archives of Mining Sciences																						1			1
Archivos de Bronconeumologia																								1	1
Asian Journal of Social Psychology																						1			1
Aslib Proceedings																							1		1
Behavioral Ecology and Sociobiology																				1			3	1	5
Berichte Zur Wissenschaftsgeschichte																					1				1
BMC Health Services Research																							1		1
Community Mental Health Journal															1										1
CTA Odontologica Scandinavica																		1							1
Decision Support Systems																							1		1
Disability and Rehabilitation																			1						1
Drug and Alcohol Review																				1					1
DYNA																								1	1
Electronic Library																								1	1
European Integration Online Papers																								1	1
Field Methods																								1	1
Games and Economic Behavior																								1	1
Group & Organization Management															1										1
Human Nature-An Interdisciplinary Biosocial perspective																								1	1
IEEE Communications Magazine																							1		1
IEEE Transactions on Image Processing																								1	1
IEEE Transactions on Mobile Computing																						1	1		2
IEEE Transactions on Multimedia																							1		1
Information Processing & Management																				1					1
Information Research-An International Electronic Journal																					1				1
International Journal of Modern Physics																						1	1		2
International Journal of Operations & Production Management																								1	1
International Journal of Urban and Regional Research																					1				1
Journal of Applied Psychology																				1					1
Journal of Business Ethics																						1			1
Journal of Computer-Mediated Communication																					1				1
Journal of Conflict Resolution		1																							1
Journal of Economic Dynamics & Control																				1					1
Journal of Economic Geography																					1				1
Journal of Evolutionary Economics																							1		1
Journal of International Business Studies																							1		1
Journal of Marketing Research					1												1								2
Journal of Peace Research																					1				1
Journal of Politics																						1			1
Journal of the Association for Information Systems																								1	1
Journal of the European Economic Association																							1		1
Journal of Theoretical Biology																				1					1
Journal of Universal Computer Science																							1		1
Latin American Research Review																								1	1
North American Journal of Fisheries Management																						1			1
Organization Science						1				1						1							1		3
Physica A-Statistical Mechanics and its Applications																					1	2	1		4
Physical Review E																							1		1
Physics Letters A																					1				1
PloS Computational Biology																							1		1
PLoS One																						1		1	2
Proceedings of the National Academy of Sciences of the USA																			1	1			1		3
Proceedings of the Royal Society B-Biological Sciences																							1		1
Public Administration Review																								1	1
RBGN-Revista Brasileira de Gest3o de Neg3cios																							1		1
Regional Studies																							1		1
Research Policy																			2	1					3
Revista de Neurologia																						1			1
Scientometrics																				1					1
Sloan Management Review														1											1
Social Networks															1	1									2
Social Science & Medicine																						1			1
Sociologia										1															1
Synthese																							1		1
Szociological Szemle																						1			1
Technovation																								1	1
Total	1	0	0	0	0	1	1	0	0	1	2	0	1	1	3	1	2	3	7	9	10	15	23	20	101

The journals that had the greatest number of publications were:

- Behavioral Ecology and Sociobiology: its publications are aimed at quantitative empirical and theoretical studies in the analysis of interactions between animals. It has an impact factor of 2917.
- Organization Science: with an impact factor of 3.130, covers areas such as strategy, management and organizational theory.
- Physica A-Statistical Mechanics and its Applications: recognized by the European Physical Society, its publications cover the field of statistical mechanics. It has an impact factor of 1441 and publishes an average of 24 issues per year.
- Proceedings of the National Academy of Sciences of the USA: toward the physical sciences, biological and social, has an impact factor of 9643.
- Research Policy: it is a multidisciplinary journal which examines such areas as innovation, research & development, technology and science. It has an average of 10 issues per year and an impact factor of 2655.

A joint analysis of the thematic areas described by the database and the keywords most used by the authors of 101 articles allowed the codification of the papers in the following areas: performance, evolution, management, graphics, model, game theory. In Table 2 you can check the development of areas over time.

Table 2

Publications by area and year.

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Total
Performance																					1			2	3
Evolution										1					1			1	3	1	4	5	5	1	22
Management						1	1				1				1	1	1	1			2	1	2	4	16
Graphics	1														1	1	1	1	1	5	2	4	8	4	29
Model											1		1	1						1	2		2	7	17
Game theory																				1	1	1	3	6	14
Total	1	0	0	0	0	1	1	0	0	1	2	0	1	1	3	1	2	3	7	9	10	15	23	20	101

Although the first publication date from 1987, was from 2005 the number of publications began to increase, partly by the increase in publications in general and some of the most recent interest of researchers and managers on the subject cooperation and social networks.

Until 2005 there was basically the concern of identifying new forms of management, given the increasing pressure for innovation and less time to develop new products. Since 2005, the most important area was graphics, representing the interaction between the actors.

As a result, we see areas: development, which focuses on business development over time; model, which indicates the necessity of building work defined schema; management, directly linked to corporate strategy; game theory, in the context of encouraging innovation; performance, representing the interest in gaining competitive advantage.

Figure 2 graphically displays the distribution of areas, between the years 2005, and 2010.

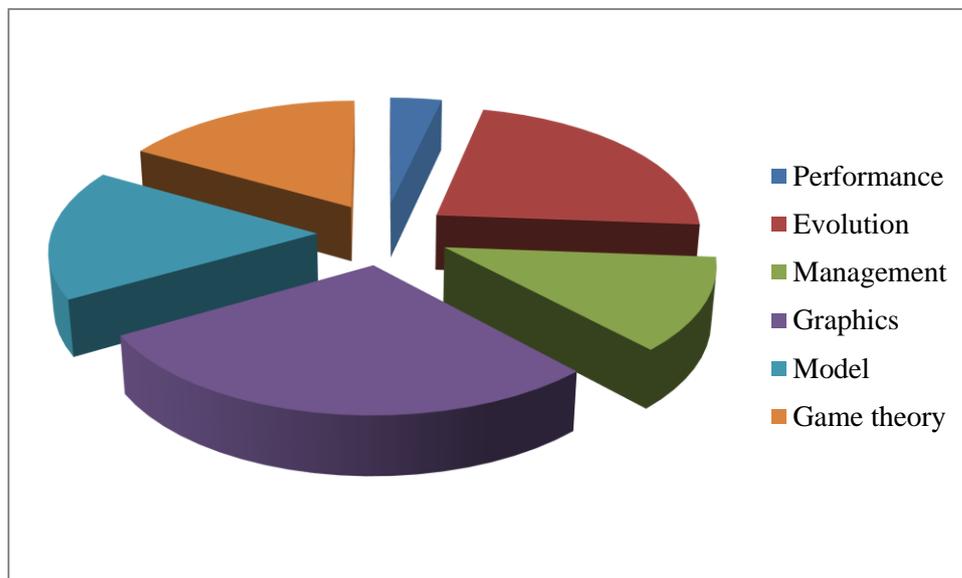


Figure 2. Distribution of areas between 2005 and 2010.

After reviewing the publications, were performed the analysis of citations. The first was an analysis of 19 articles with more than ten citations (see Table 3).

Table 3

Articles with more than ten citations.

Article	Journal	Citations
Walker et al. (1997)	Organization Science	265
Tsai (2002)	Organization Science	125
Giuliani and Bell (2005)	Research Police	66
Eguiluz et al. (2005)	American Journal of Sociology	65
Wagner and Leydesdorff (2005)	Research Police	51
Costenbader and Valente (2003)	Social Networks	49
Iacobucci and Hopkins (1992)	Journal of Marketing Research	46
Chwe (1999)	American Journal of Sociology	44
Daveni and Kesner (1993)	Organization Science	41
Giuliani (2007)	Journal of Economic Geography	39
Croft et al. (2006)	Behavioral Ecology and Sociobiology	34
Poncela et al. (2008)	PLoS One	28
Brandt and Sigmund (2005)	Proceedings of the National Academy of	27
Flap and Volker (2001)	Social Networks	26
Cantner and Graf (2006)	Research Police	25
Wuyts et al. (2004)	Journal of Marketing Research	24
Ferrin et al. (2006)	Journal of Applied Psychology	23
McDonald (2007)	Proceedings of the National Academy of	23
Hutt et al (2000)	Sloan Management Review	21

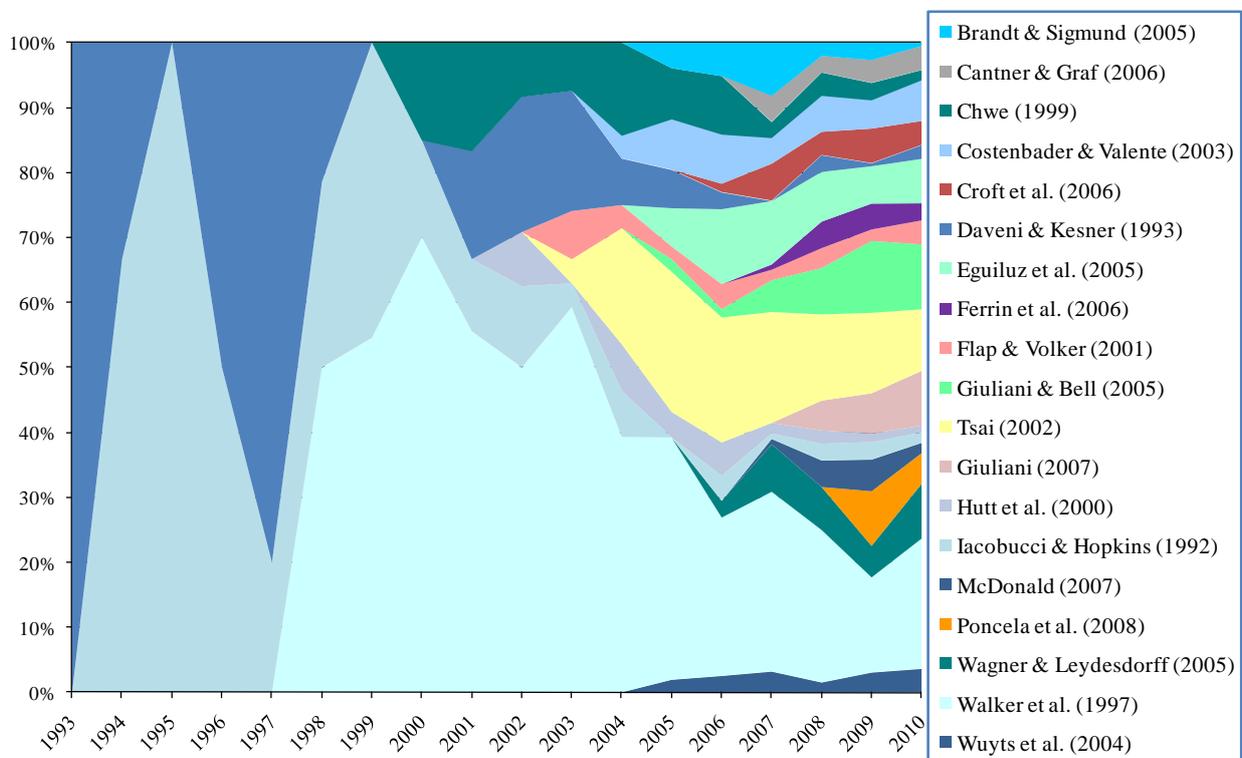


Figure 3. Evolution quote of the 19 most cited papers.

Between the years 1993 (first quote received by the 19 most cited papers) and 1998 were cited: Daveni and Kesner (1993), Iacobucci and Hopkins (1992), Walker et al. (1997). Between 1999 and 2004, began to receive citations: Chwe (1999), Costenbader and Valente (2003), Flap and Volker (2001), Tsai (2002), Hutt et al (2000). But between 2005 and 2010, were also cited articles: Giuliani and Bell (2005), Eguiluz et al. (2005), Wagner and Leydesdorff (2005), Giuliani (2007), Croft et al. (2006), Poncela et al. (2008), Brandt and Sigmund (2005), Cantner and Graf (2006), Wuyts et al. (2004), Ferrin et al. (2006), McDonald (2007).

The second citation analysis was the analysis of co-citation network of articles, which indicates articles that have been cited together in the work (see Figure 4). For the construction of the networks, two software were used: Sitkis 2.0 (Schildt, 2002) and Ucinet for Windows – Version 6.289 (Borgatti et al, 2002).

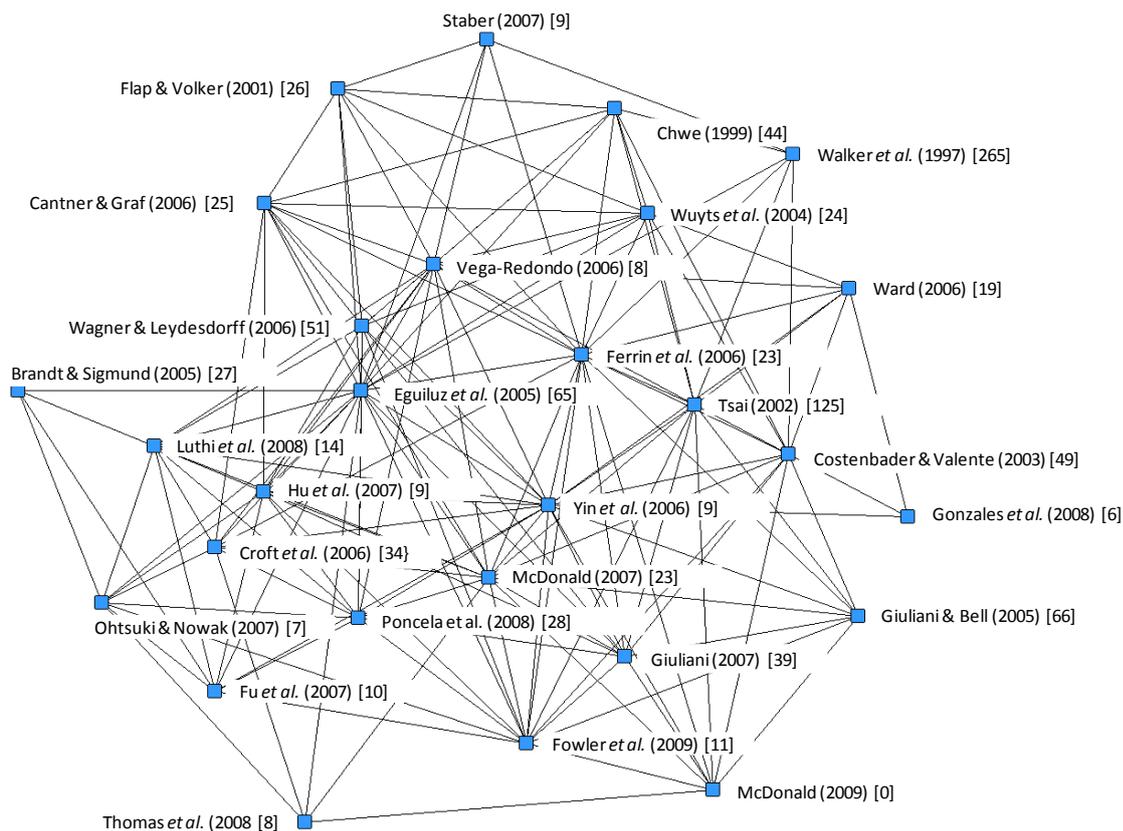


Figure 4. Co-citation network.

Another network analyzed was the cross citation network, which features authors who cite each other in the works (see Figure 5). This network allows us to identify possible clusters of authors that may indicate streams of research. We identified eight groups of authors dealing with

the same theme, and themes: trust, strategic alliances, game theory, social capital, intensity of interaction, cooperation nature, reciprocity and innovation.

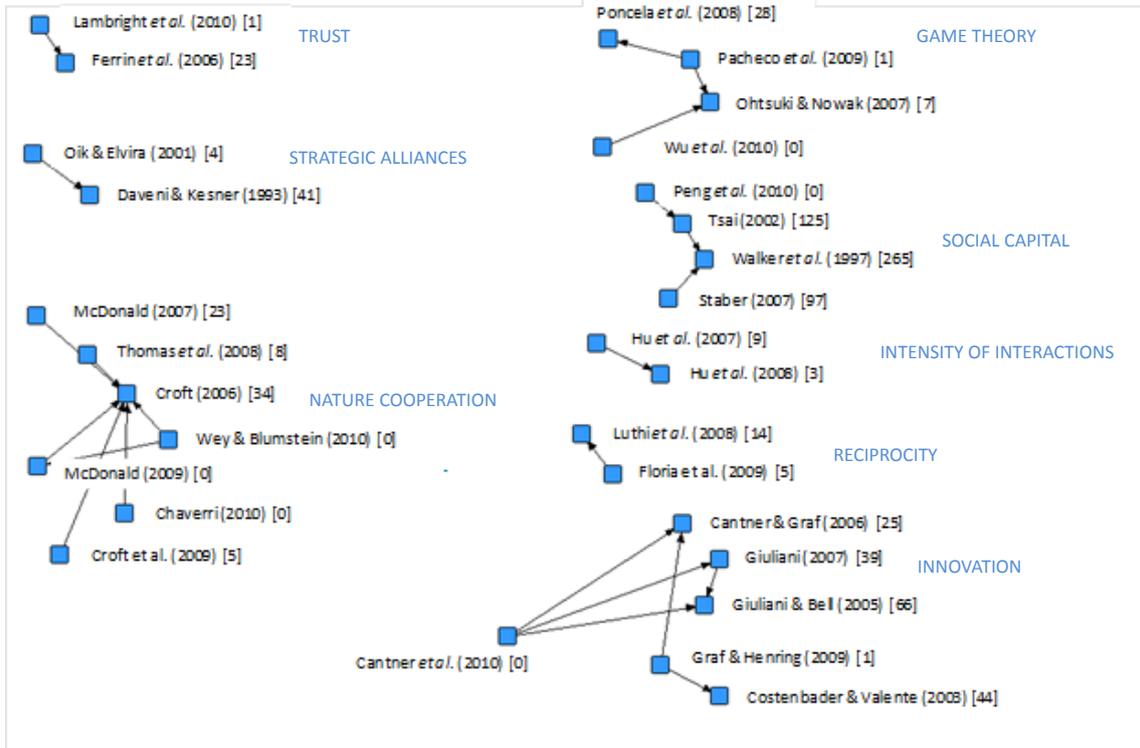


Figura 5. Rede de citação cruzada.

Finally, we analyzed the network of collaboration between countries in the development of the 101 research articles.

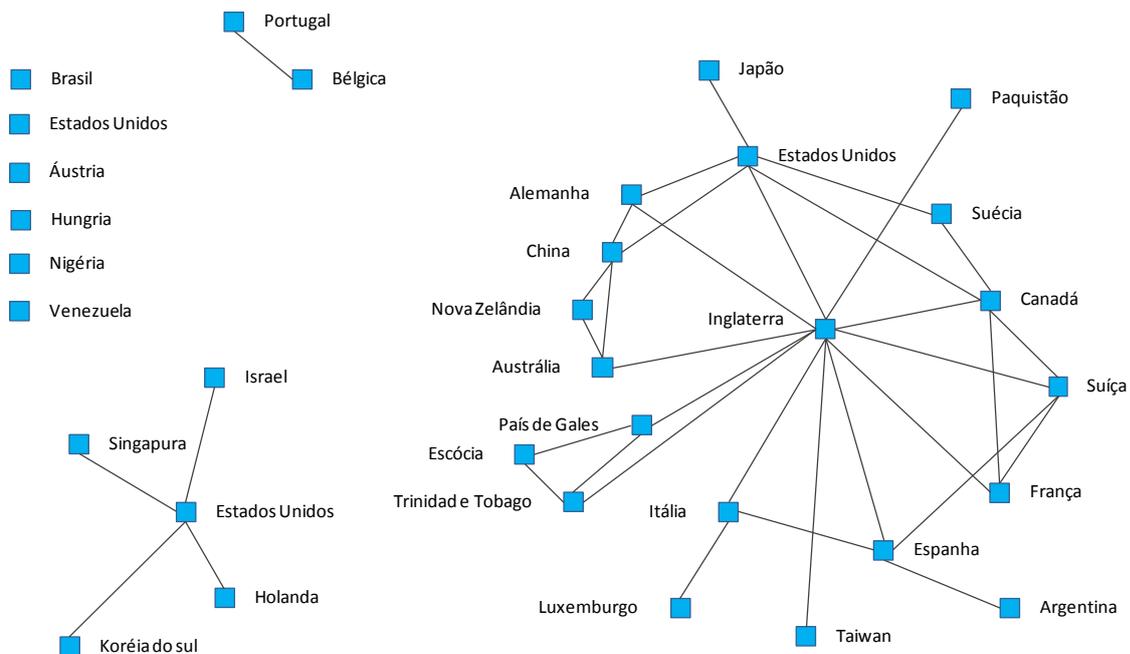


Figure 6. Cooperation network.

England is very central, followed by the United States, Switzerland and Canada. Some countries developed without collaboration, which are: Brazil, USA, Austria, Hungary, Nigeria and Venezuela.

4. CONCLUSIONS

This research allowed us to analyze quantitatively and qualitatively the theory of social networks and cooperation. The journals that more published were: Behavioral Ecology and Sociobiology, Organization Science, Physica A-Statistical Mechanics and its Applications, Proceedings of the National Academy of Sciences of the USA, Research Policy.

The analysis of the areas highlighted the need for companies to seek new ways of managing their business, focusing on cooperation through social networks in search of better results and achieve competitive advantage. Although the first publications date from 1987, was from 2005 that publications have grown significantly.

The citation network analysis showed that there is no concentration of work on specific authors, confirming the multidisciplinary of the subject.

BIBLIOGRAPHY

CARVALHO, M.M. Inovação: estratégias e comunidades de conhecimento. Editora Atlas, 2009.

CHESNAIS, F. A mundialização do capital. São Paulo: Xamã, 1996.

NEELY, A. The evolution of performance measurement research: developments in the last decade and a research agenda for the next. International Journal of Operations & Production Management. Vol. 25, n. 12, p. 1264-1277, 2005.

PRASAD, S.; TATA, J. Publication patterns concerning the role of teams/groups in the information systems literature from 1990 to 1999. Information & Management. Vol. 42, n. 8, p. 1137-1148, 2005.

WASSERMAN, S.; FAUST, K. Social network analysis: methods and applications. Cambridge University Press, 1994.

WILLIAMSON, O.E. The Economic Institutions of Capitalism. New York: Free Press, 1985.