



January 2005
The Small World of Italian Board Directors.
The Map of Power.

The small world of Italian Board Directors

■ Introduction

A new way to analyse the interlaces between the listed companies is to adopt the principles of network theory. With the presence of directors in more than one board, a limited number of companies act like connectors for the system.

The members of the board of directors of the 275 Italian listed companies on 21st July 2004 are thousands. The relations that can occur between a so big number of people have recently been understandable through methods of analysis of **Theory of Networks**.

A theory that studies the behaviour and the evolution of entities interconnected among them and, for which, every type of social network, economic network, biologic network, etc. follows certain laws.

In the Theory of Networks a particular phenomenon has been studied: the "Small World", term that has become popular after the publication on Nature in June 1998 of the article "*Collective dynamics of small world networks*" by Watts and Strogatz, two scientists of Cornell University in New York. The article says that every person on earth is separated from one another by a limited number of relationships. In other terms, anyone can contact an unknown person through a chain formed by very few relationships. The rule is applicable to many network contexts, even to the one formed by board of directors.

Casaleggio Associati has created a research of the Italian listed companies' board of directors, of which some results are here reported.

In the research the directors or, alternatively, the companies are considered network "nodes" and the presence of a director in more than one board of directors are the "links", or connections.

Overall 227 companies are connected among themselves with at least one director. Of these, four companies are connected among themselves, but not with the rest of the system. The results here reported are relative to the sample of 223 companies (227-4) that represent 81% of the total and is therefore the net of board of directors.

■ The companies

A first result that came out from the analysis is the nature of **“Small World” of the Italian boards of directors**. The term small world is used for networks where, with a limited number of relationships, its members can get in contact with whoever belongs to it. The number obtained from the Italian directors is 4,2: *every director can get in relation with one another through an average of about four steps*. To make a comparison, the directors of the top 1000 Fortune companies, in a study conducted by the University of Michigan Business School, have an average number of connections of 4,6 as a consequence of the same director in at least two boards, 21% of directors. The same study revealed that the record man in terms of presences in USA boards was Vernon Jordan, on ten boards simultaneously, on which he could meet 106 other directors.

The possibility of a direct contact inside all listed companies is due to the simultaneous presence of people in more than one board, on the total of directors about 15% has at least two seats, 5% three and 3% has between 4 and 7 concurrent directorships. This group of directors glues together the small world of the Italian boards.

■ The board directors

The average number of directors' handshakes through which two companies can contact each other is three (3,4).

The cases of companies with directors in common represent 83%, 44% have at least two and 25% have more than two. Some companies have a role of connectors with their directors on the boards of many other companies, owned or not.

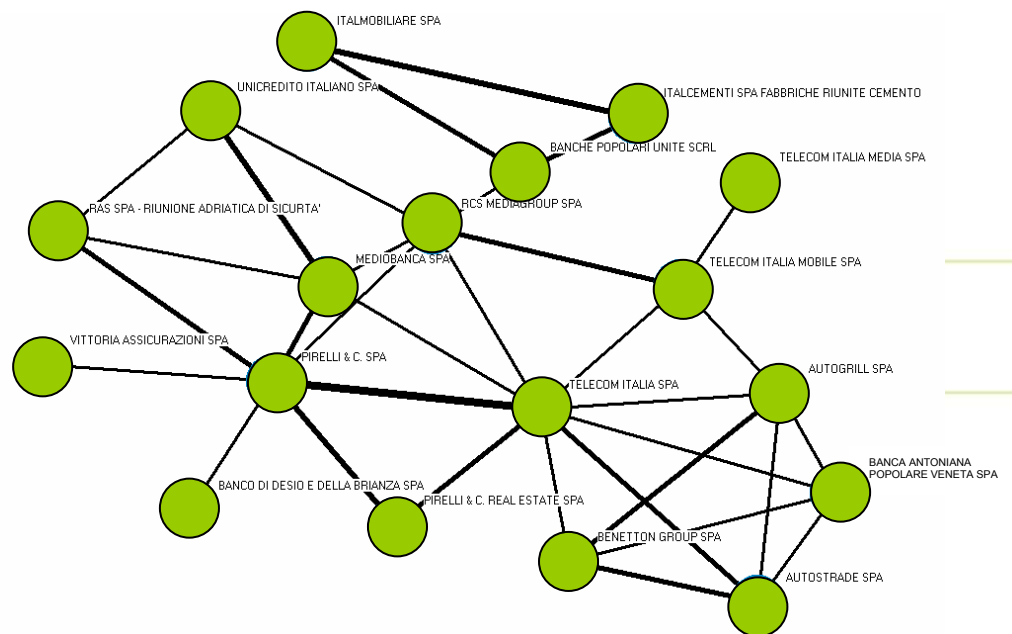
Among the 223 listed companies, a company can get in contact with another in three steps with its board members.

■ The companies that tie the system together

If we consider the entire system of listed companies on the Italian stock exchange and the importance of single companies in terms of connections with others, a central subset comes out formed by **eighteen companies** that are interconnected among themselves and that link to the rest of the companies.

This central subset of companies is formed by, in alphabetical order: Autogrill, Autostrade, Banca Antoniana Popolare Veneta, Banco di Desio e della Brianza, Banche Popolari Unite, Benetton, Italcementi, Italmobiliare, Mediobanca, Pirelli, Pirelli Real Estate, Ras, Rcs Mediagroup, Telecom Italia, Telecom Italia Media, Telecom Italia Mobile, Unicredito Italiano, Vittoria Assicurazioni.

Eighteen companies have the role of connectors in the system formed by companies on the Italian Stock Exchange.



Source: Casaleggio Associati, 2004

■ The main group

The relations between companies determine the formation of groups of companies “tied” by directors, companies that have stronger ties than average and that can be seen as macro groups.

These macro groups are structures formed by several companies, similar to closed systems, where the information can circulate and the decisions can be taken faster in comparison to the whole system of listed companies.

The study shows one main group where the connections are more developed. Ninety-three companies form this main group.

It’s importance is due both to the number and quality of interconnections, quality that is expressed by the connections with other companies that have themselves many connections in the main group.

In the main group there are four clusters where the directorship’ interconnections are higher.

In every cluster there is a company that reigns.

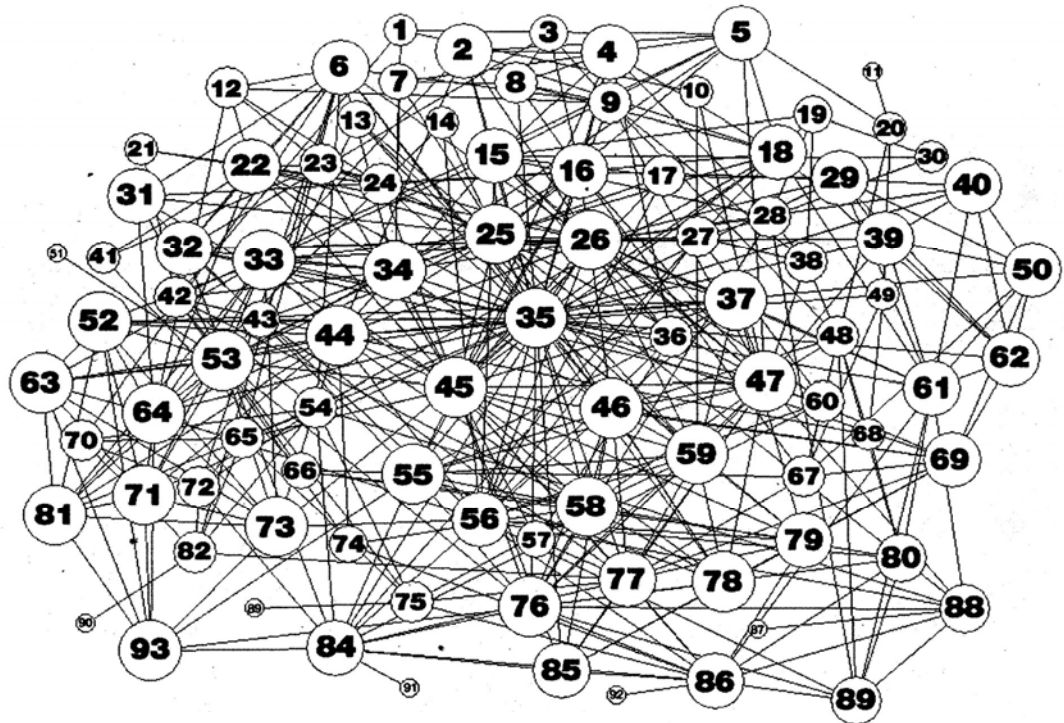
The clusters in order of importance are:

cluster Pirelli (42 companies) Alleanza Assicurazioni, Assicurazioni Generali, Autogrill, Autostrade, Banca Antoniana Popolare Veneta, Banca Intesa, Banca Lombarda e Piemontese, Banca Nazionale del Lavoro, Banche Popolari Unite, Banco di Desio e della Brianza, Banco Popolare di Verona e Novara, Benetton, Camfin, Capitalia, Cia, Credito Bergamasco, E-Biscom, Fiat, Fondiaria-Sai, Gim, Juventus Football Club, Interpump, Iffi, Ifil, Italcementi, Italmobiliare, Premafin, Mediobanca, Milano Assicurazioni, Mittel, Pirelli, Pirelli Real Estate, Ras, Rcs Mediagroup, Smi, Società Cattolica di Assicurazione, Telecom Italia, Telecom Italia Media, Telecom Italia Mobile, Tod's, Unicredito Italiano, Vittoria Assicurazioni;

cluster Cir (6 companies) Banca Intermobiliare di Investimenti e Gestione, Cdb Web Tech, Cir, Cofide, Gruppo Editoriale l'Espresso, Sogefi;

cluster Mediaset (5 companies) Arnoldo Mondadori Editore, Eni, Gewiss, Mediaset, Mediolanum;

cluster Marzotto (5 companies) Italjolly, Linificio e Canapificio Nazionale, Marzotto, Zignago e Zucchi.



Bigger the circle more are the connection of the company

Source: Casaleggio e Associati, 2004

- | | | | |
|----|---|----|---|
| 1 | Luxtotta Group Spa | 48 | Stefanel Spa |
| 2 | Mittel Spa | 49 | Credito Bergamasco Spa |
| 3 | Compagnia Immobiliare Azionaria - Cia Spa | 50 | Banca Intermobiliare Di Investimenti E Gestioni Spa |
| 4 | Alleanza Assicurazioni Spa | 51 | Montefibre Spa |
| 5 | Banca Lombarda E Piemontese Spa | 52 | Banco Di Desio E Della Brianza Spa |
| 6 | Merloni Elettrodomestici Spa | 53 | Banche Popolari Unite Scrl |
| 7 | Acegas - Aps Spa | 54 | Mediaset Spa |
| 8 | Banca Nazionale Del Lavoro Spa | 55 | Benetton Group Spa |
| 9 | Tod's Spa | 56 | Camfin Cam Finanziaria Spa |
| 10 | Beni Stabili Spa | 57 | Immobiliare Lombarda Spa |
| 11 | Saeco International Group Spa | 58 | Autostrade Spa |
| 12 | Fiat Spa | 59 | Telecom Italia Spa |
| 13 | Poligrafici Editoriale Spa | 60 | Buzzi Unicem Spa |
| 14 | Ergo Previdenza Spa | 61 | Cir Spa - Compagnie Industriali Riunite |
| 15 | Gim Spa - Generale Industrie Metallurgiche | 62 | Cdb Web Tech Investments Spa |
| 16 | Assicurazioni Generali Spa | 63 | Granitifiandre Spa |
| 17 | Credito Emiliano Spa | 64 | Vittoria Assicurazioni Spa |
| 18 | Banca Intesa Spa | 65 | Mediolanum Spa |
| 19 | Zignago Spa - Industrie Zignago S. Margherita | 66 | Lottomatica Spa |
| 20 | Societa' Cattolica Di Assicurazione Scarl | 67 | Banco Popolare Di Verona E Novara Scrl |
| 21 | Trevi - Finanziaria Industriale Spa | 68 | Brembo Spa - Freni Brembo |
| 22 | Ifil - Finanziaria Di Partecipazioni Spa | 69 | Milano Assicurazioni Spa |
| 23 | Juventus Football Club Spa | 70 | Gewiss Spa |
| 24 | Ifi Spa - Istituto Finanziario Industriale | 71 | Maffei Spa |
| 25 | Rcs Mediagroup Spa | 72 | Eplanet Spa |
| 26 | Ras Spa - Riunione Adriatica Di Sicurta' | 73 | So.Pa.F. Spa - Societa' Di Partecipazioni Finanziarie |
| 27 | Zucchi Spa - Vincenzo Zucchi | 74 | De Longhi Spa |
| 28 | Marzotto Spa | 75 | Arnoldo Mondadori Editore Spa |
| 29 | Gruppo Editoriale L'espresso Spa | 76 | Autogrill Spa |
| 30 | Italjolly Spa - Compagnia Italiana Dei Jolly Hotels | 77 | Fondiarina - Sai Spa |
| 31 | Gruppo Coin Spa | 78 | Banca Antoniana Popolare Veneta Spa |
| 32 | E.Biscom Spa | 79 | Capitalia Spa |
| 33 | Italmobiliare Spa | 80 | Seat Pagine Gialle Spa |
| 34 | Unicredito Italiano Spa | 81 | Negri Bossi Spa |
| 35 | Pirelli & C. Spa | 82 | Data Service Spa |
| 36 | Smi Spa - Societa' Metallurgica Italiana | 83 | Dmt Digital Multimedia Technologies Spa |
| 37 | Pirelli & C. Real Estate Spa | 84 | Sirti Spa |
| 38 | Linificio E Canapificio Nazionale Spa | 85 | Premafin Finanziaria Spa Holding Di Partecipazioni |
| 39 | Cofide Spa - Compagnia Finanziaria De Benedetti | 86 | Immsi Spa |
| 40 | Sogefi Spa | 87 | Snam Rete Gas Spa |
| 41 | Euphon Spa | 88 | Saipem Spa |
| 42 | Eni Spa | 89 | Interpump Group Spa |
| 43 | Ratti Spa | 90 | Finmatica Spa |
| 44 | Italcementi Spa Fabbriche Riunite Cemento | 91 | Datamat Spa |
| 45 | Mediobanca Spa | 92 | Roncadin Spa |
| 46 | Telecom Italia Media Spa | 93 | Permasteelisa Spa |
| 47 | Telecom Italia Mobile Spa | | |

■ The companies at the centre of communication

The expression “betweenness centrality” means the centrality of a node for the system it belongs to. The companies at the centre of communication, those that make it possible for two boards to communicate directly, or with the least number of steps, are companies with high betweenness centrality. Their directors are comparable to “actors in the middle”, people informed on the market and with which new people can be met, and that have, due to their role, a strong influence on the system.

The list of companies at the centre of communication, or with high betweenness centrality, has changed in the last years. Since December 1998 to July 2004, only seven companies remained in the top twenty:

Alleanza Assicurazioni, Camfin, Fondiaria-SAI, Mediobanca, Pirelli, RAS e Telecom Italia.

The companies, in order of importance, in **1998** were:

Pirelli, Ras, Holding di Partecipazioni Industriali, Acqua Pia Antica Marcia, Camfin, Seat, Mediobanca, Alleanza Assicurazioni, Fondiaria Assicurazioni, Snia Bpd, Telecom Italia, Acquedotto De Ferrari Galliera, Editoriale l'Espresso, Marzotto, Cir, Italiana Assicurazioni, Autogrill, Fiat, Unicem e Rolo Banca 1473.

In **2004** the companies were:

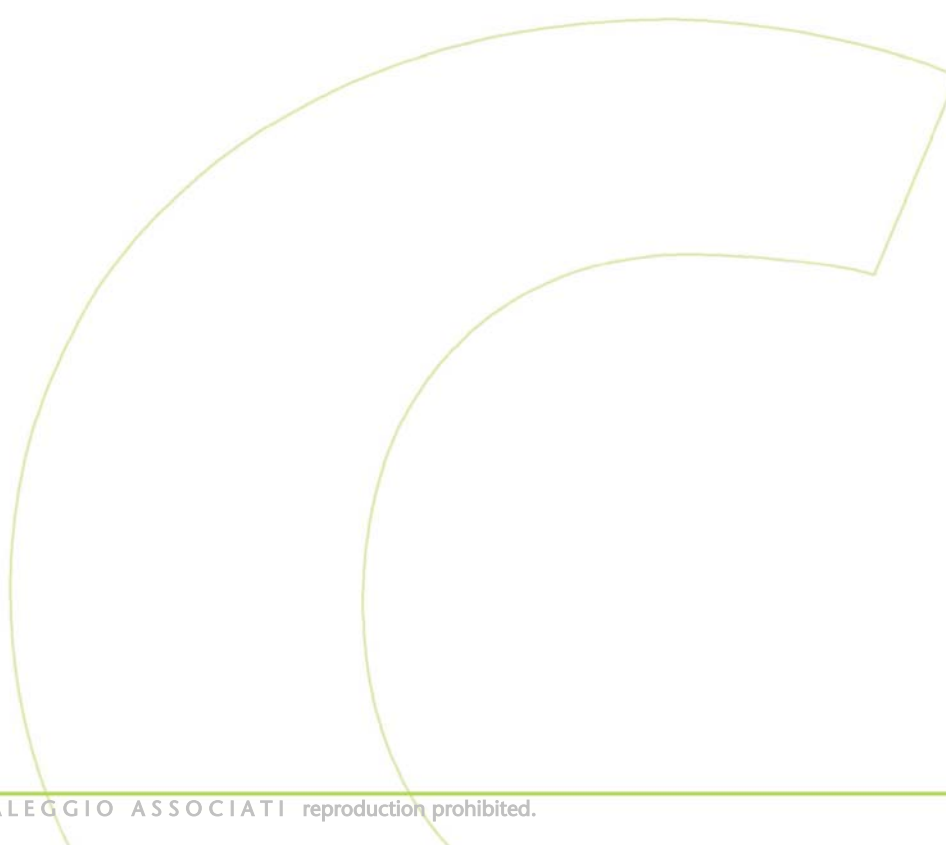
Pirelli, Mediobanca, Fondiaria, Ras, Sorin, Acea, Unicredito Italiano, RCS, Bipielle investimenti, Telecom Italia, Merloni, Camfin, Alleanza Assicurazioni, Autogrill, Telecom Italia Mobile, Telecom Italia Media, Immsi, Banca Lombarda e Piemontese, Italcementi e Sirti.

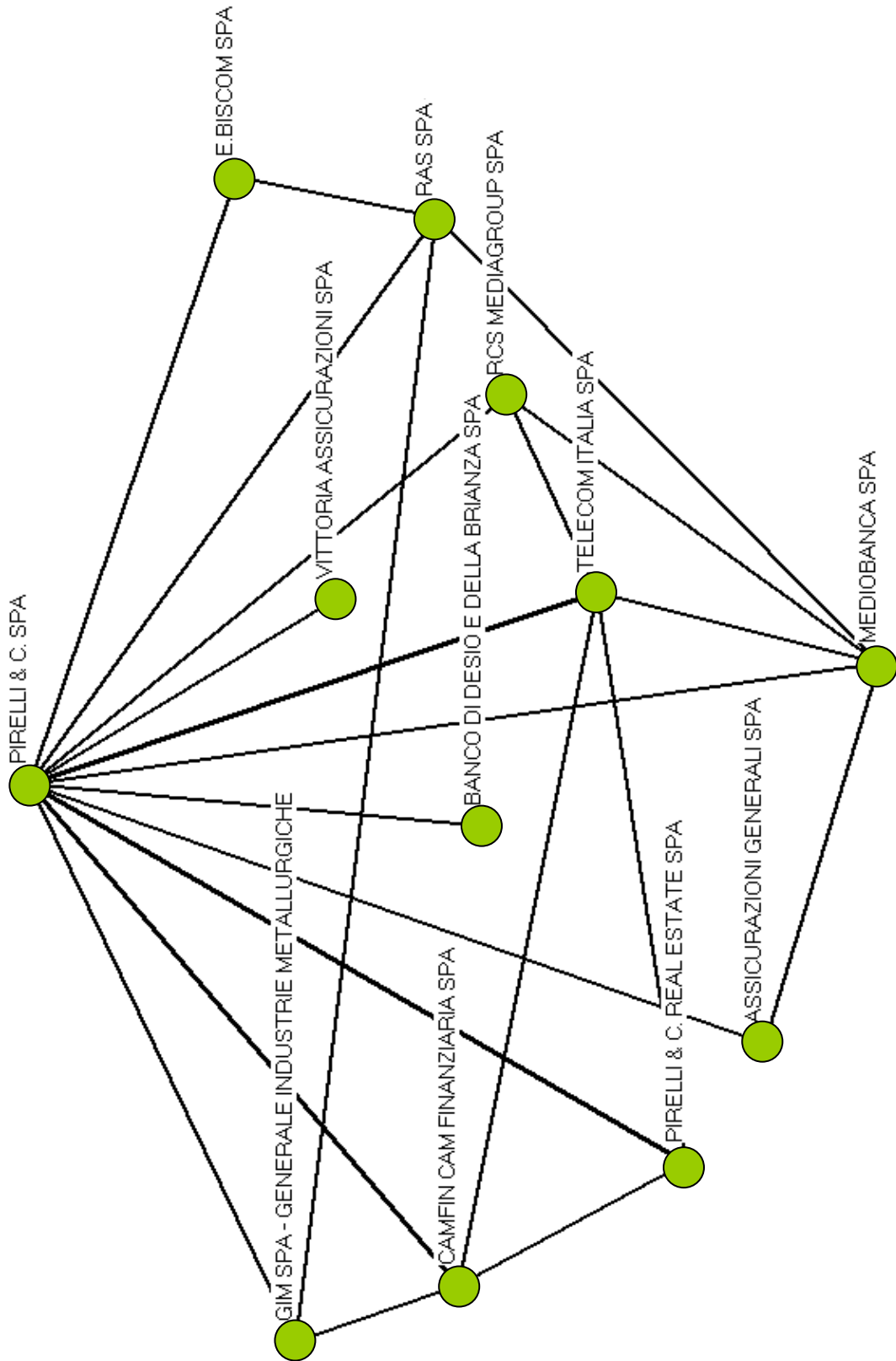
■ The four clusters of the main group

The four clusters of the main group are here represented. Boards of directors are represented as nodes and the lines that connect them show the fact that one or more directors are present in both boards. Thicker the line, higher the number of directors.

The first picture is relative to the Pirelli cluster, formed by 42 companies. The picture was simplified and contains only the companies directly linked to Pirelli.

There are 12 companies in the picture.

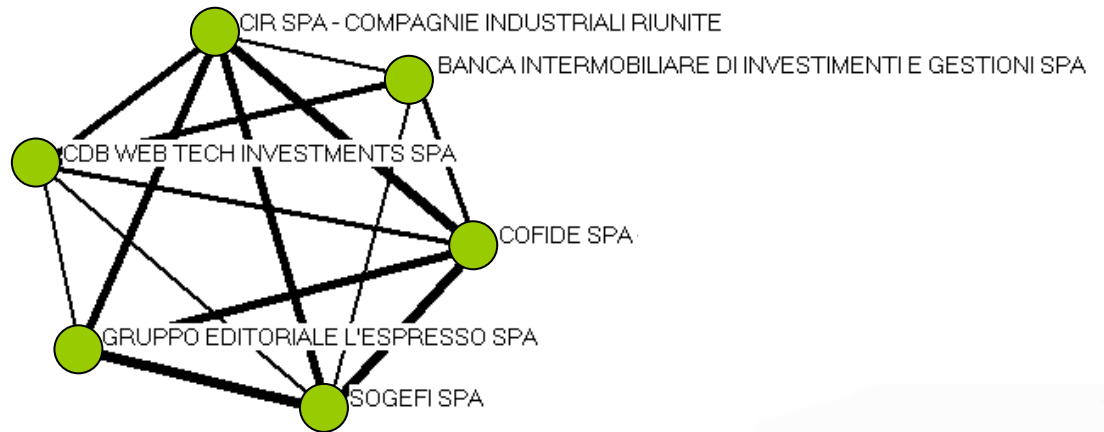




Source: Casaleggio Associati, 2004

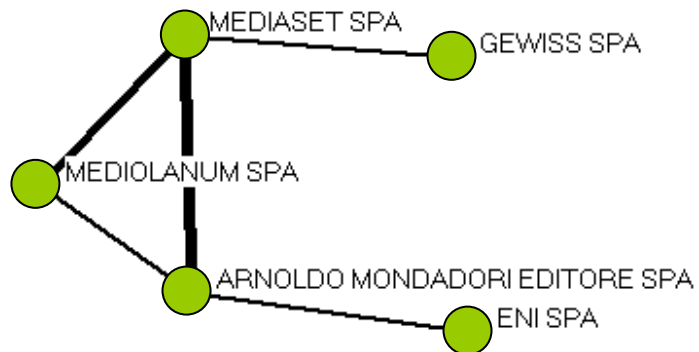
The Small World of Italian Board Directors

The following picture is relative to the Cir cluster, with six companies with high interconnection in a star connection.



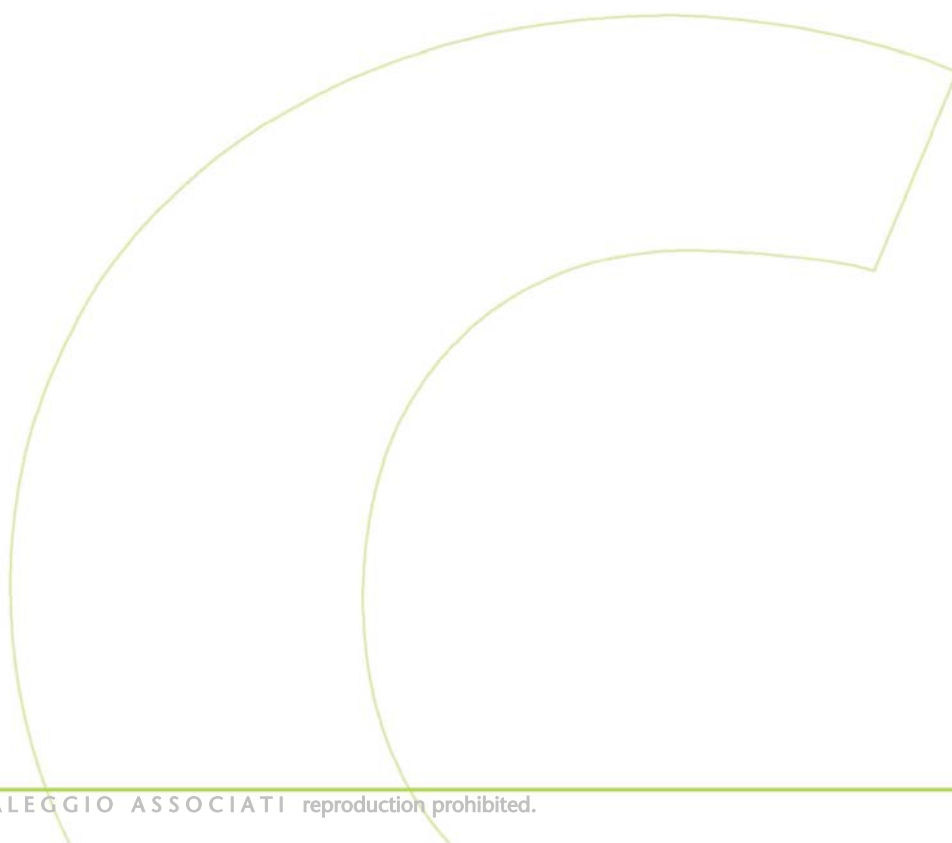
Source: Casaleggio Associati, 2004

The picture here below represents the Mediaste cluster with five companies. It's characterized by a strong triad connection.



Source: Casaleggio Associati, 2004

The last picture, Marzotto cluster, is formed by five companies and is very similar to the third one with it's central triad.

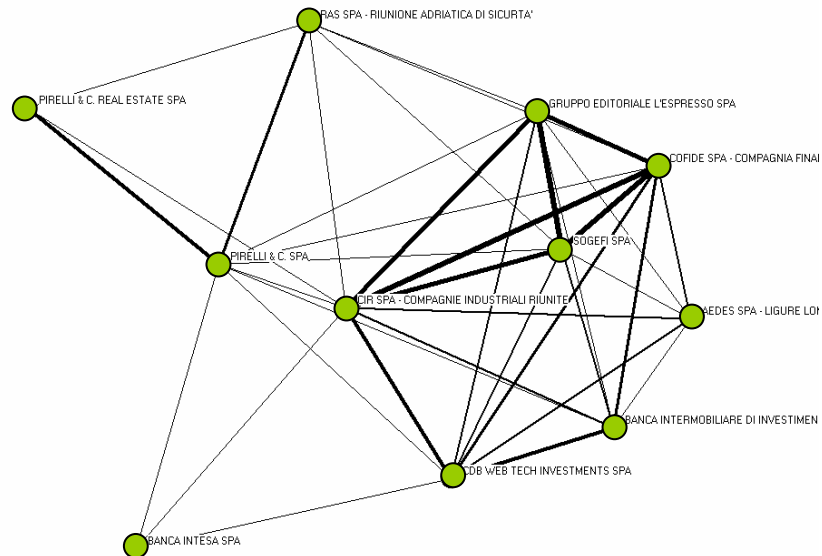


■ The relationship between boards

Any company can be seen for it's relationship with the rest of the world looking at the direct ties it has with other companies.

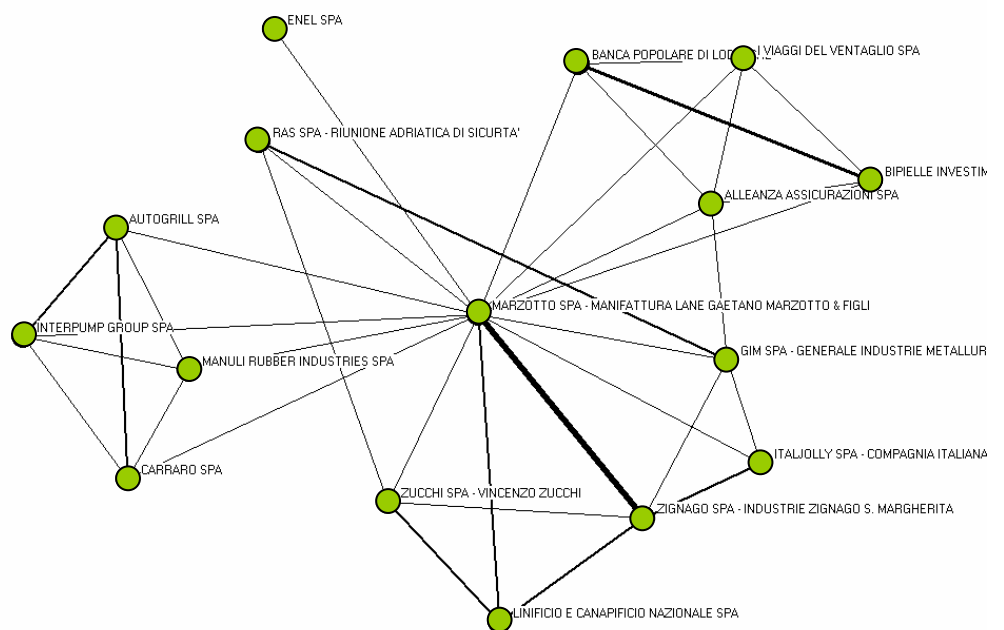
For example the same four companies central to clusters analysed before hand are here reported.

Cir (10 connected companies) Aedes, Banca Intesa, CDB Web Tech Investments, Cofide, Gruppo Editoriale L'Espresso, Pirelli & C. Real Estate, Pirelli & C., Ras, Sogefi.



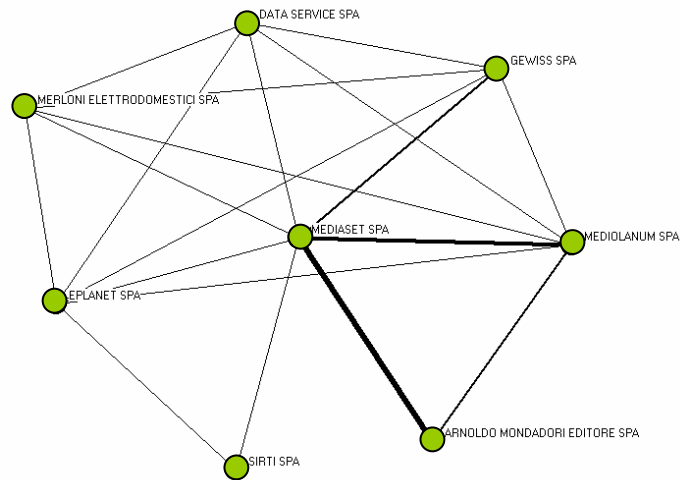
Source: Casaleggio Associati, 2004

Marzotto (15 connected companies) Alleanza Assicurazioni, Autogrill, Banca Popolare Di Lodi, Bi皮elle Investimenti, Carraro, Enel, Gim, I Viaggi Del Ventaglio, Interpump Group, Italgolly, Linificio e Canapificio Nazionale, Manuli Rubber Industries, Ras, Zignago, Zucchi.



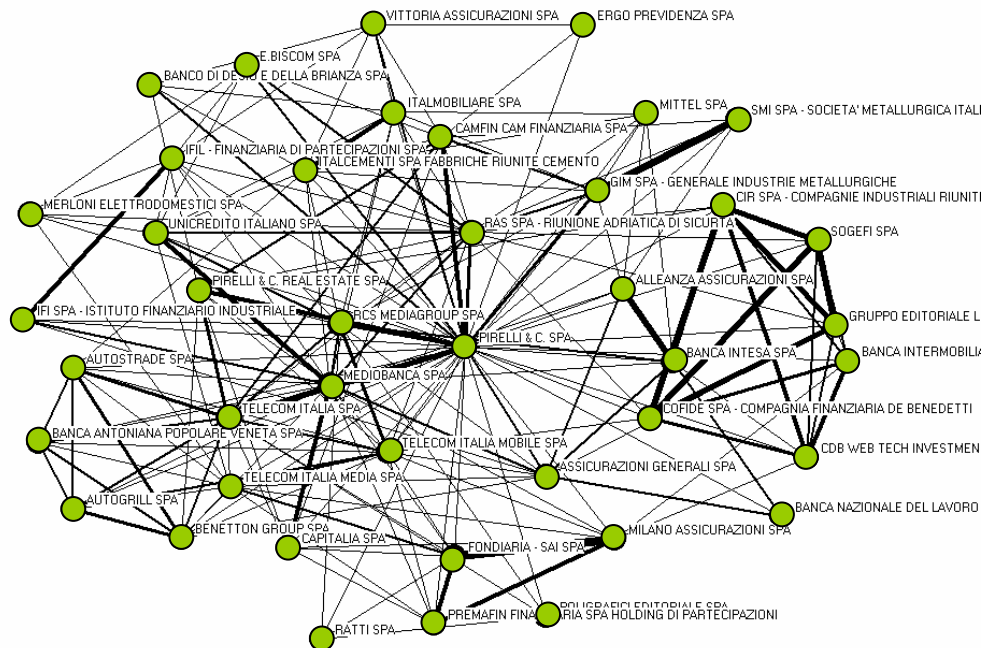
Source: Casaleggio Associati, 2004

Mediaset (7 connected companies) Arnaldo Mondadori Editore, Data Service, Eplanet, Gewiss, Mediolanum, Merloni elettrodomestici, Sirti.



Source: Casaleggio Associati, 2004

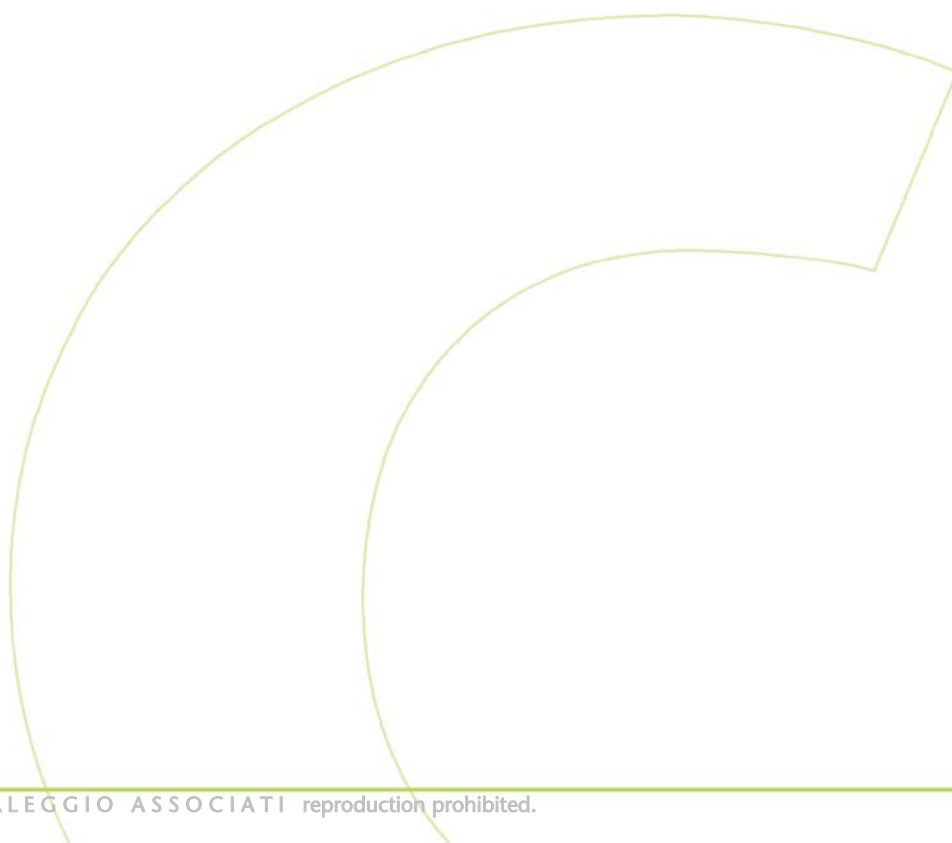
Pirelli (41 connected companies) Alleanza Assicurazioni, Assicurazioni Generali, Autogrill, Autostrade, Banca Antoniana Popolare Veneta, Banca Intermobiliare di Investimenti, Banca Intesa, Banca Nazionale del Lavoro, Banco di Desio e della Brianza, Benetton Group, Camfin Cam Finanziaria, Capitalia, CDB Web Tech Investments, Cir, Cofide, E.biscom, Ergo Previdenza, Fondiaria – Sai, Gim, Gruppo Editoriale L'Espresso, Ifi, Ifil, Italcementi, Italmobiliare, Mediobanca, Merloni elettrodomestici, Milano Assicurazioni, Mittel, Pirelli & C. Real Estate, Poligrafici editoriale, Premafin Finanziaria, Ras, Ratti, Rcs mediagroup, Smi, Sogefi, Telecom Italia Media, Telecom Italia Mobile, Telecom Italia, Unicredito Italiano, Vittoria Assicurazioni.



Source: Casaleggio Associati, 2004

■ Main points:

- Twenty companies are central for the communication in the system of listed companies.
- In the system of listed companies an interconnected main group of 93 companies emerge.
- The main group of companies is formed by four clusters.
- In the 223 listed companies a company can talk to any another trough it's board members with three handshakes.
- In the 223 listed companies a director can talk to any other another trough a colleague with four handshakes.



■ Social Network Analysis Methodology

Main theoretic principles

Networks represent a conceptual tool that allows you to observe and describe social relationships in a community, groups and organizations, allowing to compare different systems or the evolution in time of a single one.

The objective of the social network analysis consists in the construction of descriptions and measurements of the system structure where the agents interact.

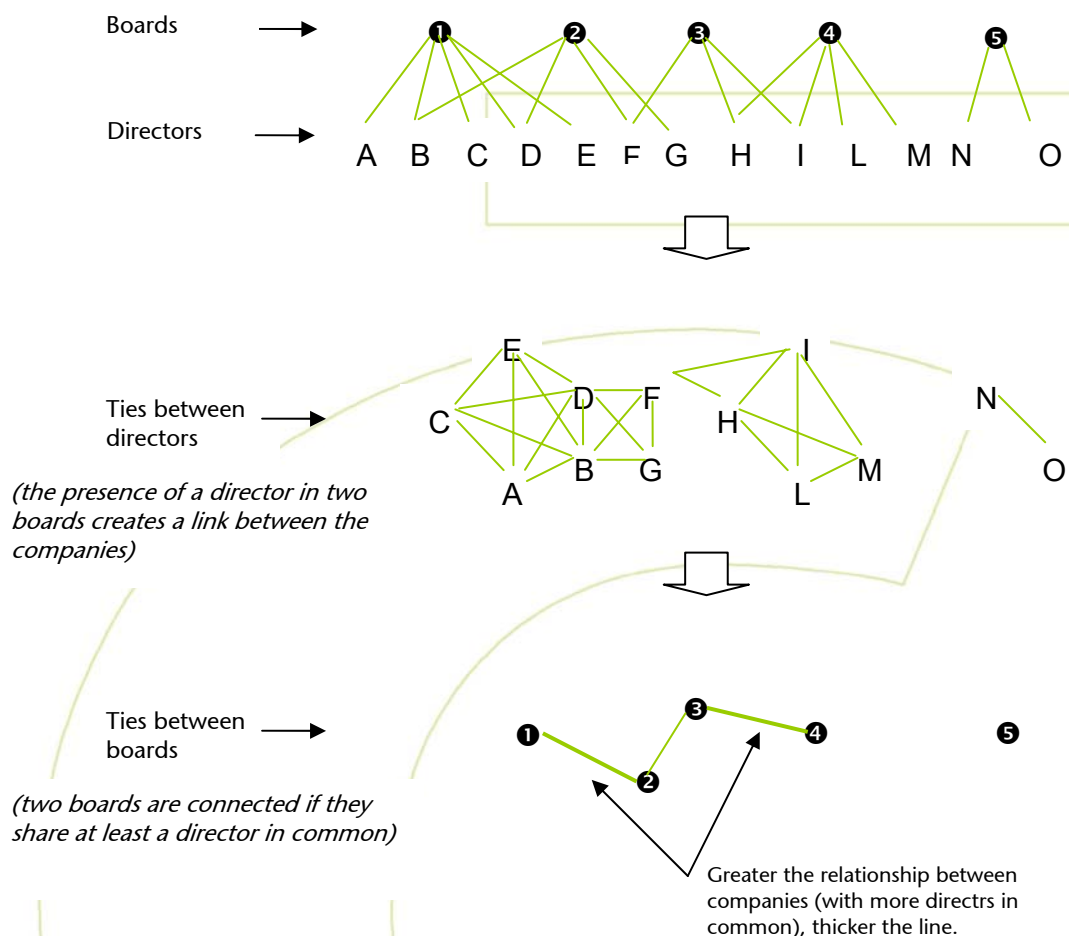
Social Network Analysis is a methodology that in the years has found various applications, from medicine to sociology. It can have an impact in all those sectors where the interaction map can explain the functioning of the system.

Social network analysis of board directors

The analysis of the Boards of Directors of the Italian listed companies was conducted through a social network methodology.

The analysis is based on data relative to 21st July 2004 of the Italian Stock Exchange.

The map of relationships was designed using the classic bipartite analysis, shown here below.



■ Profile of Casaleggio Associati

The mission of Casaleggio Associati (www.casaleggio.it) is to development strategic Net consulting for companies through the specific skills of our associates, affiliates and partners and to produce reports on the digital economy. The company's objective is to develop a Net culture in Italy through original studies, consulting and articles, books, newsletters, seminars and through the creation of brainstorming and focus groups.

Casaleggio Associati defines the structure, purpose and implementation path for sustainable and profitable **business models** for the use of the Net and identifies **web marketing** strategies through the study of the target of reference, the message to be conveyed and the channels to be used. Casaleggio Associati assists companies in the development of the **Intranet** that allows each individual company user to access the processes and information that regard them in a profiled mode through a dedicated portal.

Finally, it identifies Social Networking techniques for companies that operate in the "relationship business" (such as CRM, sales processes, Intranet marketing, etc.) and develops social network applications for the analysis, management and direction of relationships.

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