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**The Italian Chamber of Lords Sits on Listed Company Boards  
An Empirical Analysis of Italian Listed Company Boards From 1998 to 2006**

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**Abstract**

The purpose of the present paper is to contribute to the literature on country interlocks by illustrating and analysing the interlocking directorships in the Italian listed companies from 1998 to 2006. We find that over the entire period a high percentage of the Italian listed companies are connected with each other mainly through a very small minority of directors. Such group of interlocking (overwhelmingly male) directors shows a remarkable stability over time with very few entrants and very few exits mainly related to the passing away of the director. We define them for brevity the Lords of the Italian stockmarket. Lords tend to belong to families of directors, with the first five families having more than 100 directorships in nine years. The highest level of connectivity concerns those companies that belong to the MIB 30/S&P-MIB 40 index, the Italian Blue Chips. In particular, practically all the financial Blue Chips are connected with each other through a web of directors continuously from 1998 to 2006. The extent, depth, and stability of the connections among the Italian listed companies, and in particular the main Italian financial companies, raise doubts on the extent of their competitive behaviour.

**Keywords:** corporate governance, interlocking directorships, board turnover, antitrust, competition, social network analysis (SNA), exploratory data analysis (EDA), empirical corporate finance.

**JEL classifications:** C0, L1, L4, G3, M2.

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## **1. Introduction. The role of interlocking directorships in corporate governance**

There are several theories on the function of interlocking directorships. Mizruchi's (1997) comprehensive review on the topic illustrates three main reasons for the formation of interlocks: collusion, cooptation and monitoring, and legitimacy, career advancement, and social cohesion.

As for the first reason, the extensive debate on the causes and consequences of interlocks started in the early twentieth century when the US Senate Pujo Committee, analysing the linkages between the main New York banks and the industrial sector, argued that interlocks between competitors provided a means of restricting competition. In 1914 Supreme Court Justice Louis Brandeis expressed this point with the following words:

*The practice of interlocking directorates is the root of many evils. It offends laws human and divine. Applied to rival corporations, it tends to the suppression of competition and to violation of the Sherman Law. Applied to corporations which deal with each other, it tends to disloyalty and to violation of the fundamental law that no man can serve two masters. In either event it leads to inefficiency; for it removes incentive and destroys soundness of judgment. It is undemocratic, for it rejects the platform: "A fair field and no favors"- substituting the pull of privilege for the push of manhood.<sup>2</sup>*

In the same year Section 8 of the Clayton Act expressly prohibited interlocks between firms competing in the same markets. Interlocking would facilitate the collusion between firms creating an informal communication channel between directors who could use it to make agreements against the consumers. Interlocking directorships can be a useful instrument to cartelize a market because sharing directors allows cartel participants to have an observer in place monitoring activities that could undermine the cartel agreement. A system based on direct interlocking directorates may thus potentially produce economic inefficiencies (Carbonai, Di Bartolomeo 2006). Pennings (1980) found a positive association between industry concentration and horizontal ties (interlocking directors between firms operating in the same sector), while Burt (1983) found an inverted U-shaped function: in the case of very high market concentration, the few producers have little need to interlock to set prices.

A second reason for the formation of interlocks is cooptation and monitoring (Dooley, 1969 and Mizruchi and Stearns, 1994). According to Selznick (1949), cooptation is "the absorption of

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<sup>2</sup> Quoted by Elouaer (2006).

potentially disruptive elements into an organization's decision-making structure". The idea is that firms invite on their board representatives of the various resources they depend on to reduce environmental uncertainty and maintaining their position in the market. For this reason companies have on their boards bankers, suppliers, clients (Pfeffer e Salancik, 1978). As regards monitoring, information theories hold that there are information asymmetries between creditors and debtors, since creditors, that is banks, know less about the quality of debtors. Interlocking is one of those institutions that can help surmount information asymmetry (Mariolis, 1975). Its function is to monitor debtors by offering access to internal information. Through membership in directorates and boards banks are able to keep the company management under their influence. Dooley (1969) finds that less solvent firms are likely to be interlocked with banks. Later studies also report that firms with high debt-to-equity ratios (Pfeffer, 1972) or organizations with an increased demand for capital (Mizruchi and Stearns, 1988) have a higher tendency to interlock their boards. The quest for legitimacy is a further source of interlocking (Selznick, 1957). In order to better their reputation firms invite on their boards individuals with ties to important organisations.

Moving from a firm perspective to an individual director perspective, that is from a demand perspective to a supply perspective, Zajac (1988) states that one reason for interlocks is the fact that individuals join boards for financial remuneration, prestige, and contacts that may prove useful in securing subsequent employment opportunities. Furthermore, according to Useem (1984), interlocks are a tool to promote upper-class cohesion creating a business elite. Such incentives for directors to assume multiple directorships might have negative consequences. According to Ferris et al. (2003) and Fich and Shivdasani (2006), multiple directorships place an excessive burden on directors with a negative impact on their ability to monitor and influence managers (business hypothesis).

Although they start from different theoretic reasons for the formation of interlocks, all the empirical studies agree that interlocking directorates create a special communication channel between linked firms, which can lead to similar behaviour (Davis, 1991). Examples are the adoption of multidivisional forms (Palmer et al., 1993), the similarity of political campaign contributions (Mizruchi, 1992), and the recourse poison pills (Davis, 1991).

More in particular, those empirical studies that examine the hypothesis of collusion find that interlocking directorates can have a negative impact on the economic system since they endanger the independence of interlocked firms, decrease competition in the market for corporate control, exacerbate agency problems, violate directors' fiduciary obligations as the agents of stockholders

(Fich and White, 2005), and improve the ability of the controlling shareholders to expropriate the minority shareholders, extracting private benefits from control (Barucci 2006). As regards the market for corporate control, Cotter et al. (1997) study director interlocks between bidder and target firms. Their findings suggest that the presence of director interlocks reduces the gains to target shareholders and decreases the likelihood that a target firm receives multiple bids. Such results indicate that interlocking directorships can affect target shareholder gains in at least two ways. First, interlocked directors have fiduciary obligations to the shareholders of both the target and the bidder, thus creating a conflict of interest. Second, such directors, ameliorating the information asymmetry between the interlocked bidder and target may dissuade other likely bidders from bidding. Moreover, Fich and White (2003) report a negative association between the number of interlocking directorships and the probability of CEO turnover. Finally, as regards the risk of expropriation of minority shareholders, according to Bertoni and Randone (2006) this risk is higher for companies tied by board interlocks, because these firms are more likely to act in concert entailing an advantage for the controlling shareholders who appoint the majority of directors and a higher risk of expropriation for non-controlling shareholders.

Much empirical research has been carried out on the effect of interlocks on firm performance. Having seen above the plurality of the views on the function of interlocks, it is with no surprise that results of these studies are mixed (Bunting, 1976, Pennings, 1980, Burt, 1983, Fligstein and Brantley, 1992, and Phan et al. 2003). For instance, according to the reputation hypothesis, entering in the corporate elite has a positive impact on firms' value, while the business hypothesis assumes the opposite effect (see Table 1 and Table 2).

Another important part of the empirical literature on interlocks focuses on providing data on the actual extent of interlocks in several countries (see Table 3). These studies analyse the structure of the networks created by interlocking directors and match the "small world phenomenon", a situation in which firms have a high degree of interconnection through a relatively small number of firms which act as hubs. However, an important caveat is that such country studies refer to single years, generally comparing two different years. Making a comparison between the networks of interlocking directorships of different countries would be of great interest but this turns out to be a very difficult task: different country studies use different sample sizes, different selection criteria, different measures of density of the network. As far as we know there are only two works that try to address this issue: Stokman and Wasseur (1985) and Leo Mac Canna et al. (1998), both using an old database of 1976.

The purpose of the present paper is to contribute to the literature on country interlocks by illustrating and analysing the interlocking directorships in the Italian listed companies belonging to the MTA market over a nine-year period, from 1998 to 2006. In 2006 the MTA market covered about 95% of the capitalisation of the Italian stock market (Borsa Italiana).

Director interlocks in Italy are not a novelty. Speaking about the Italian industrial system at the end of the nineteenth century, Ciocca (2007) observes that the Italian large companies were already characterised by crossshareholdings, company pyramids, shareholder agreements, interlocking directorships, with at least some big linkers. Even after the First World War, the Italian capitalism continued to be characterised by a few dominant industrial and financial groups and conglomerates characterised by the same control features. Rinaldi (2004) and Rinaldi and Vasta (2005), in their analysis of the Italian capitalism between the end of the II World War and the '70s, find that during this period interlocks established through a very small number of directors, called *big linkers* by Rinaldi and Vasta (*Lords* in this paper), played an important role in guaranteeing the stability of the system. At the end of the war there was the need for coexistence between state-owned enterprises and private companies, while avoiding the domination of either of the parties over the other. According to the authors, one of the instruments used to obtain the stabilisation of orders of control was the practice of interlocking directorates. While until 1962 the network was centred on the larger electrical companies, with a very high degree of cohesion, after 1962, with the nationalisation of the electricity industry, it was replaced by a new and less cohesive one, hinged on financial intermediaries: banks, insurance and finance companies which took back, at least in part, the position that they had held in the 1920s. Finally, Bianchi et al (2005) explicitly identify as a characteristic of the Italian stockmarket since the 1970s the widespread recourse to director interlocks (and to cross-shareholdings). According to the authors such elements may have favoured collusion, non-aggression pacts, and may have reduced competition<sup>3</sup>. Such features fall within the debate on the persistent Italian economic backwardness and in more recent years, economic decline (Barca and Visco 1992, Ciocca 2000, Visco 2003).

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<sup>3</sup> "Per quanto riguarda le grandi imprese va osservato che assai diffusa è stata la pratica di condivisione degli amministratori, nonché quella delle partecipazioni incrociate. La composizione dei consigli di amministrazione dei grandi gruppi industriali è stata molto spesso simile: le stesse persone infatti ricoprivano ruoli di rilievo negli organismi di più aziende. questi elementi possono aver favorito forme di collusione, pratiche di non aggressione e quindi contribuito a ridurre la concorrenza." Bianchi et al 2005, p. 39.

In the last few years different works have analysed the interlocking directorates in Italy. Bianco and Pagnoni (1997) find that the phenomenon of interlocking directorates was well present between 1985 and 1995, with more than 20% of directors sitting on more than one board and the directors of financial companies having on average a higher number of boards. These results are consistent with Barbi (2000) on the period 1983-1998. Barbi analyzes interlocking directorships as a legal device aiming to support control positions without concentrating cash flow rights. More recently, Bertoni and Randone (2006) examine the network of ownership interconnections and board interlocks among Italian listed companies from 1999 to 2004.<sup>4</sup> They show that both networks have “small-world” characteristics and analyse how they evolve during this period, showing that while ownership interconnections decrease, board interlocks increase their relevance<sup>5</sup>.

The paper proceeds as follows: in section 2 we illustrate data and methodology; in section 3 the results; section 4 concludes.

## 2. Data and methodology

Our database is made of the directors sitting on the Italian listed company boards from 1998 to 2006 included. We refer to the companies making the MTA market, which is the main market of the Italian stock market (Borsa Italiana).<sup>6</sup>

### 2.1. Board composition dynamics and interlocks

The directors' board dynamics over the time for the company  $c$  :

$$board_{c,t} = board_{c,t-1} + \int_t^{t+1} (en - ex) dt \quad (1)$$

Where:

$$en(t) = \frac{d}{dt} en \cdot t = en$$

$$ex(t) = \frac{d}{dt} ex \cdot t = ex$$

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<sup>4</sup> For a detailed illustration of the ownership structure of the Italian capitalism see Bianchi, Bianco and Enriques (2002) and Bianchi and Bianco (2006)

<sup>5</sup> To complete the survey of recent works on board composition of the Italian companies it is necessary to refer to Ferri, Masciandaro and Messori (2001) who observe a high stability in the board structure for local banks in Italy and Volpin (2002), who finds a lower turnover of top executive directors.

<sup>6</sup> In 2006 the MTA (Mercato Telematico Azionario or Electronic Share Market) made almost the 99% of the total capitalization of Borsa Italiana: see Consob (2007), p. 56.

$en(t)$  refers to the number of entrants at time  $t_i$ ,  $ex(t)$  is the number of exits.  $board_{c,t}$  is the board size at time  $t_i$ . Exits and Entrants over the time are aggregate flows by company  $c$ . A director  $i$  can be entrant in a board or exit in another or sit in more than one board simultaneously at  $t_i$ . A single director  $i$  who sits on more than one board is defined as an interlock. By data we investigate the structure of interlocking directorship network (the matrix 8), a director  $i$ , the director flows, through the number of directorships during the time (equation 10), the cohesion and the centrality aspects (from equation 12 to 23), and finally the emersion of the cliques and other cohesive subgroups and the network persistency mechanisms (from equation 25 to 28)<sup>7</sup>.

## 2.2. The interlocking directorship network over time<sup>8</sup>

A network<sup>9</sup> or a graph  $G = (V, E)$  is a set  $V$  of vertices or nodes ( $q$ ) that link a set  $E$  of edges or ties. Networks are usually represented by an adjacency matrix  $B$  where  $B_{i,j} = 1$  if there is an edge,  $B_{i,j} = 0$  if not. If an edge connects every vertex  $V$ , a graph (or a network)  $G$  is complete. The Freeman degree of a node  $d(q)$  is the number of edges related to ( $q$ ). The set of the neighbours (nodes) of  $q$  is  $N_G(q)$  and they are connected to  $q$  by an edge. To represent the network over the time, initially we have a data matrix  $A_1$  referring to the entire database<sup>10</sup>:

$$A_1 = \begin{pmatrix} d_{1,1} & c_{1,2} & a_{1,3} & \dots & a_{1,k} & t_{1,z} \\ d_{2,1} & c_{2,2} & a_{2,3} & \dots & a_{2,k} & t_{2,z} \\ d_{3,1} & c_{3,2} & a_{3,3} & \dots & a_{3,k} & t_{3,z} \\ \dots & \dots & \dots & \dots & \dots & \dots \\ d_{31643,1} & c_{31643,2} & a_{31643,3} & \dots & a_{31643,k} & t_{31643,z} \end{pmatrix} \quad (2)$$

Where:

$$d_{i,1} = \{ "director_1", "director_n" \}, i = 1 \dots 31643; c_{i,2} = \{ "company_1", "company_n" \}, i = 1 \dots 31643$$

$$a_{i,3 \dots k} = \{ "attribute_{1,3..k}", "attribute_{n,3..k}" \}, i = 1 \dots 31643; t_{i,z} = \{ year_1 \dots year_n \}, i = 1998 \dots 2006$$

<sup>7</sup> Here we follow an exploratory data analysis approach. We do not assume any hypothesis concerning the network structure. We look at structures or patterns in data that clarify any subsequent statistical analysis. "Instead of testing prespecified structural hypotheses, we explore social networks for meaningful patterns": De Nooy Mrvar Batagelj (2005).

<sup>8</sup> Wesserman Faust Iacobucci (1994)

<sup>9</sup> Wesserman Faust (1994) Newman (2007)

<sup>10</sup> Consob data

The statistical unit (represented by the row of the matrix 2) is the directorship. Each director  $d_{i,1}$  could have  $n$  multiple directorships where the same directorship is characterized by  $k-2$  qualitative attributes  $a_{i,3..k}$  over time  $t_{i,z}$ . From (2) we obtain an affiliation<sup>11</sup> matrix  $A_2$  and then we partition it by year  $t_i$ , obtaining nine affiliation matrices ( $A_{2,t=1998...2006}$ ) characterised by row by the same director  $i$  and in column by the company  $c$ <sup>12</sup>. The term  $dir_{j,q}$  represents the existence of a directorship. Every year  $t_i$  the number of the companies (in columns) and directors (in row) change due to new listed companies, delistings, and so on.

$$A_{2,t} = \begin{pmatrix} dir_{1,1} & dir_{1,2} & dir_{1,3} & \dots & dir_{1,W} \\ dir_{2,1} & dir_{2,2} & dir_{2,3} & \dots & dir_{2,W} \\ dir_{3,1} & dir_{3,2} & dir_{3,3} & \dots & dir_{3,W} \\ \dots & \dots & \dots & \dots & \dots \\ dir_{J,1} & dir_{J,2} & dir_{J,3} & \dots & dir_{J,W} \end{pmatrix} \quad (3)$$

Where:

$$dir_{j=1..J, w=1..W} = \{0,1\}, j = 1..J, w = 1..W; w = \{company_1, \dots, company_W\}; j = \{director_1, \dots, director_J\}; t_i = \{year_1 \dots year_n\}, i = 1998 \dots 2006$$

The directorships (either for each year and globally) over the period considered by each director  $d_j$  are obtained from the affiliation matrix  $A_{2,t=1998...2006}$ :<sup>13</sup>

$$DIR_d = \sum_{t=1998}^{2006} \left( \sum_{w=1}^W dir_{j,w} \right)_t = \left( \sum_{w=1}^W dir_{j,w} \right)_{1998} + \left( \sum_{w=1}^W dir_{j,w} \right)_{1999} + \dots + \left( \sum_{w=1}^W dir_{j,w} \right)_{2006}, d = 1..n \quad (4)$$

At the same time, from the affiliation matrix it is possible to obtain the number of directors by company during the period 1998-2006<sup>14</sup>:

$$D_w = \sum_{t=1998}^{2006} \left( \sum_{j=1}^J dir_{j,w} \right)_t = \left( \sum_{j=1}^J dir_{j,w} \right)_{1998} + \left( \sum_{j=1}^J dir_{j,w} \right)_{1999} + \dots + \left( \sum_{j=1}^J dir_{j,w} \right)_{2006}, w = 1..W \quad (5)$$

<sup>11</sup> Company- director

<sup>12</sup> These data matrices could be merged in a unique longitudinal dataset of the network data

<sup>13</sup> The number of directorships by director in the period 1998-2006 is in table 4. In table 5 we identify directors with  $DIR_d > 23$  in nine years (with an average on 2.5 directorships by year). In table 6 we cross-tabulate directors found in table 5 with their attributes in matrix 3. The number of directorships chosen is based on table 4 (we identify approximately the highest 5% of directors of the listed companies examined).

<sup>14</sup> The board size is in appendix 2.



The family<sup>15</sup> as a whole:

$$DIR_{fam(d)_t} = \sum_{m=1}^M \left( \sum_{w=1}^W dir_{j,w} \right)_t \quad (6)$$

Where  $m$  represents the family member of the family  $fam(d)_t$ . Over the period considered we obtain<sup>16</sup> the number of family directorships in the all period:

$$DIR_{fam(d)} = \sum_{t=1998}^{2006} \left( \sum_{m=1}^M \left( \sum_{w=1}^W dir_{j,w} \right) \right) \quad (7)$$

The matrix (3) represents a two-mode network (we consider either the director  $j$  and the company  $w$  at time  $t_i$ ). Alternatively<sup>17</sup>, we can build one more network matrix by year  $t$ , either for companies, or for directors. In the case of companies we have companies in the rows and in the columns and the general term of the square matrix  $u_{i,k}$  represents the number of directors in common between company  $i$  and company  $k$  (the strength of an edge  $S_{v \neq k}$  in a generic network). In this way we obtain the matrix (8)<sup>18</sup>. We could do the same<sup>18</sup> using directors as rows and columns.

$$A_{3,t} = \begin{pmatrix} - & u_{12} & u_{13} & \dots & u_{1,n} \\ u_{2,1} & - & u_{2,3} & \dots & u_{2,n} \\ u_{3,1} & u_{3,2} & - & \dots & u_{3,n} \\ \dots & \dots & \dots & - & \dots \\ u_{n,1} & u_{n,2} & u_{n,3} & \dots & - \end{pmatrix}_t \quad (8)$$

By recoding the matrix (existence of the relationship =1, nonexistence =0) we obtain the adjacency matrix  $B_{4,t}$ . In the same way we obtain the matrix for the network of the directors. We refer to a particular network at  $t_{1998...2006}$  either for companies and for directors. In matrix (8) we consider only companies belonging to the MIB 30/S&P-MIB 40 index. In this way we obtain:  $A_{3,S\&PMIB,t}$ . We are

<sup>15</sup> Family memberships are identified as attributes in matrix (2)

<sup>16</sup> Results of (6) and (7) are in table 7.

<sup>17</sup> Hanneman, Riddle (2005).

then able to compare  $A_{3,t}$  (which considers all the listed companies) and  $A_{3,S\&PMIB,t}$  (which considers only S&P MIB index companies<sup>19</sup>).

We then transform the data matrix (8) in a longitudinal dataset of network data<sup>20</sup>. In this way we are able to study the persistence of connections over the time.

### 2.3. Director transitions and interlocks evolution

From the affiliation matrix (3) every director  $d_{i,1}$  at the time  $t$  can sit on  $n$  different boards (represented in columns), and can have some different interlocking directorships. As we know from (4) the directorships by year are obtained by the affiliation matrix:

$$DIR_{d,t} = \left( \sum_{w=1}^W dir_{j,w} \right)_t, d = 1..n \quad (9)$$

Now we consider the number of directorships  $DIR_{d,t=1998..2006}$  (relating to a single year  $t$ ) as a transition state. We use a matrix where rows represent the different transition states (1, 2 3 directorships...) at time  $t$  and the columns represent the different transition states at time  $t + 1$ . For instance the term  $a_{2,4}$  represents the number of directors who during the year<sup>21</sup> pass from two to four directorships<sup>22</sup>.

$$A_t = \begin{pmatrix} a_{1,1} & a_{1,2} & \dots & a_{1,n} \\ a_{2,1} & a_{2,2} & \dots & a_{2,n} \\ \dots & \dots & \dots & \dots \\ a_{n,1} & a_{n,2} & \dots & a_{n,n} \end{pmatrix} \quad (10)$$

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<sup>18</sup> We obtain a vector containing the interlocking directorships by company(1) and company(2) and vice-versa. We then cross-tabulate the vector obtained obtaining a matrix where in the row there is company(1) and in column company(2) by obtaining the matrix (4)

<sup>19</sup> In particular we compare network density (15) and the clustering coefficient (17)

<sup>20</sup> In this case we follow the two-step analysis as in Snijders (2003): “Any empirical analysis of longitudinal network data should start by making basic data description in the form of making graphs of the networks or plotting some basic network statistics over time. These can include the density or average degree, degree variance, number of isolates, number of components of given sizes, parameters for reciprocity, transitivity, segmentation, etc. Next to sequences of statistics for the  $M$  observed networks, it is instructive to give a description of the number and types of changes that occurred. This can be done in increasing stages of structural complexity”

<sup>21</sup> It is possible to consider different time spans and compute the director flows and the transition matrix accordingly.

<sup>22</sup> Results are in table 8 by considering each couple of years.

From this square matrix we move from the transition matrix, which represents the probability to change the transition state in one-year:

$$P_t = \begin{pmatrix} p_{1,1} & p_{1,2} & \dots & p_{1,n} \\ p_{2,1} & p_{2,2} & \dots & p_{2,n} \\ \dots & \dots & \dots & \dots \\ p_{n,1} & p_{n,2} & \dots & p_{n,n} \end{pmatrix} \quad (11)$$

Where:

$$p_{i,j} = \frac{a_{i,j}}{\sum_{j=1}^n a_{i,j}}; \quad t = \{1998 \dots 2006\}$$

$p_{i,j}$  represents the probability to go from the number of directorships  $i$  to the number of directorships  $j$  the following year. We follow the dynamics in the period 1998-2006 directly computing the director flows  $A_t$  and the probabilities of transition  $p_{i,j}$ . At the same time companies adjust over the time the number of directors on the board (in the equation 1). Both directors and companies evolve their positions during time  $t$ . It is important to note that the transitions in (10) will determinate structural changes in the network structure (equations from 12 to 24).

## 2.4. Network cohesion

For each time  $t$ <sup>23</sup>, we observe two networks, one for companies (8), one for directors. Possible indices of network structure are: size, reachability, fragmentation, density, connectedness, geodesic distance and maximum flow<sup>24</sup>. At each time  $t$ , because of changes in board composition (1), we observe different adjacency matrices  $B_{4,t=1998 \dots 2006}$  so that the relative indices can change over the time for the network.

We define as components of the network<sup>25</sup> sets of nodes in which it is possible to reach other nodes. A Graph (or network) is defined as connected when there is only one component. In a connected Graph any pair of connected nodes of a network  $i$  is the set of companies in (8) characterised by:

<sup>23</sup> Here we refer directly to the literature on Social Network Analysis. See Wasserman, Faust (1994).

<sup>24</sup> Wasserman, Faust, (1994), Hanneman, Riddle (2005). We compute these indices following Snijders (2003) as a first step in the analysis of longitudinal network data.

<sup>25</sup> Results are in table 9.

$$\sum_{i=1}^n u_{i,j} > 0, \text{ then } d(q) > 0 \quad (12)$$

A node is an isolate when the sum of the terms in the row or in the column in (6) is 0, so we define as isolates the set of companies characterised by:

$$\sum_{i=1}^n u_{i,j} = 0, \text{ then } d(q) = 0 \quad (13)$$

When  $\sum_{i=1}^n u_{i,j} = 1$  this means that only one edge connects the node to the network. In this case we have a bridge ( $d(q) = 1$ ). When there is a node that connects directly more components of a network there is a block cut point<sup>26</sup>, deleting that node we disconnect a part of network.

Reachability means that there is a path between two given nodes. So at least for these two nodes in (8)

$u_{i,j} > 0$ . Isolates are not reachable at all, so  $\sum_{i=1}^n u_{i,j} = 0$ . Network reachability  $V_t$  could be represented

as a matrix where in the rows and in the columns we have companies. Terms of the matrix are  $v_{i,j}$  :

$$v_{i,j} = 1 \text{ if a node is reachable; } v_{i,j} = 0 \text{ a node is not reachable} \quad (14)$$

Fragmentation  $F_t$  is “the proportion of nodes that are unreachable each others”<sup>27</sup>. The density  $E_t$ <sup>28</sup> in a network is directly computed by considering the  $u_{i,j}$  elements of the adjacency matrix  $A_{3,t}$  or  $B_{4,t}$  divided by the number of nodes in a network  $t$  :

$$E_t = \frac{\left( \sum_{i=1}^n \sum_{j=1}^n u_{i,j} \right)}{n \cdot (n-1)} \quad (15)$$

If  $E_t = 1$  there is perfect network connection. Another measure of density can be referred to a single node  $E_i(q)$ . This one is computed by column or row in (8).

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<sup>26</sup> Borgatti (2002)

<sup>27</sup> Borgatti (2002)

<sup>28</sup> Wassermann Faust (1994). Results are in table 10

Connectivity is the number of nodes that must be deleted to eliminate a connection between two nodes. Where  $c_i$  are connected nodes and  $c_n$  are the sum of the nodes of the network (the  $s_i$  is the number of connected nodes and  $a_i$  is the number of the isolates)<sup>29</sup>, the relative connectedness  $W_t$  is:

$$W_t = \frac{c_i}{c_n} = \frac{s_i}{(s_i + a_i)} \quad (16)$$

A measure to detect if a graph  $G$  is a “Small world”<sup>30</sup> is the clustering coefficient<sup>31</sup> for the node  $q$ :

$$CC_t(q) = \frac{2 \cdot u}{m \cdot (m - 1)} \quad (17)$$

Where  $m$  are the nodes and  $u$  are the edges in the set of the neighbours  $N_G(q)$ . We need to compute the average of (17) with respect to the network at  $t$  to obtain  $CC_t$  that is the clustering coefficient of the network at time  $t$ .

To quantitatively measure the distance using a path<sup>32</sup> from a director or a company to another one we use the geodesic distance. So the geodesic distance  $GD_{v \neq q}$  in a graph  $G$  is the measure of the distance between two different generic nodes  $v$  and  $h$ . It is the minimum path  $d$  (as a set of not repeated edges) between two different nodes of the graph:

$$GD_{v \neq h, t} = \min \left( \sum_{v \neq h}^n d_{v, h} \right) \text{ and if it does not exist a path between } v \text{ and } h \text{ } GD_{v \neq h} = \infty \quad (18)$$

Another important indicator is the mean geodesic distance ( $GD$ ), which is computed as the average of (18) considering all the companies<sup>33</sup>.

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<sup>29</sup> Krackhardt (1994)

<sup>30</sup> “We find that these systems can be highly clustered, like regular lattices, yet have small characteristic path lengths, like random graphs. We call them ‘small-world’ networks, by analogy with the small-world phenomenon (popularly known as six degrees of separation)” in Watts Strogatz (1998). See also Milgram (1967)

<sup>31</sup> Watts, Strogatz (1998). Results are in table 11

<sup>32</sup> In a Path it is not possible to repeat a network node, in a Trail is not possible to repeat a line, in the Walk it is possible to repeat both nodes and lines.

<sup>33</sup> Results are in table 12.

The maximum flow  $MF_{v \neq h}$  is the maximum number of possible paths through which it is possible to reach a node in the network.

## 2.5. Node Centrality

Centrality represents the most important indicator of relevance and power of a node  $q$  in the network. We remind that each node (either the company or in a different context the director) is characterized by the Freeman Degree,  $FD_t$  which is the sum of the links by node  $q$ :

$$FD_t(q) = \sum_{i=1}^n dir_{i,j} \quad (19)$$

With  $j = 1..W$  for the directors or  $j = 1..J$  for the companies using the matrix (3)

The Freeman Degree can be considered as a measure of local centrality<sup>34</sup>. Centrality<sup>35</sup> in a network can be represented in different ways. For instance, we can use the closeness  $CL_t$  with respect to the node  $q$ :

$$CL_t(q) = \left( \sum_{q \neq k}^n G_{q,k} \right)^{-1} \quad (20)$$

Where  $CL_t$  is the inverse of the sum of geodesic distances (defined as farness)<sup>36</sup>. Another important indicator is the betweenness  $BT_t$  of a node  $q$ <sup>37</sup>:

$$BT(q)_t = \sum_{v \neq h \neq q}^n \frac{d_{v,h}(q)}{d_{v,h}} \quad (21)$$

and the normalized betweenness<sup>38</sup>:

$$nBT(q)_t = \frac{\left( \sum_{v \neq h \neq q}^n \frac{d_{v,h}(q)}{d_{v,h}} \right)}{\frac{(n-1) \cdot (n-2)}{2}} \quad (22)$$

<sup>34</sup> Results are in table 13.

<sup>35</sup> Wassermann, Faust (1994).

<sup>36</sup> Results (in particular the farness) are shown in table 15.

<sup>37</sup> Results are in table 14.

To measure the centralization degree of the network it is possible to use  $CN_i$ <sup>39</sup>, where  $ce$  is an index of centrality (one among 19, 20 or 21 and 22)

$$CN_i = \frac{\sum_{i=1}^n (ce_{\max} - ce_i)}{\max \left[ \sum_{i=1}^n (ce_{\max} - ce_i) \right]} \quad (23)$$

### 3. Results<sup>40</sup>

#### 3.1 The Italian Chamber of Lords: basic facts<sup>41</sup>

##### *Number of directorships*

**Table 4** lists the total number of directorships of all Italian directors sitting on all listed company boards. After an increase from about 1700 directors to about 1800 in 1999, the total number of directors in the Italian stockmarket is stable until 2005, when it goes up to about 2100 due to the inclusion within our sample of the MTAX market, which was introduced in 2005 with the same characteristics of the MTA.<sup>42</sup> From the table it is possible to see that about 84% of all directors sit on just one company board (we call them onetimers for brevity) over the nine years considered. Such result is consistent with what Rinaldi and Vasta (2005) found for company interlocks in Italy through the 20<sup>th</sup> century.

The directors who sit on two or three company boards at the same time make up the bulk of the total remaining directors. Even in this case such feature tends to be constant over time, with directors who

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<sup>38</sup> The number of node is  $\frac{(n-1)(n-2)}{2}$ .

<sup>39</sup> Freeman (1979). "The star network is the most centralized or most unequal possible network for any number of actors. In the star network, all the actors but one have degree of one, and the "star" has degree of the number of actors, less one. Freeman felt that it would be useful to express the degree of variability in the degrees of actors in our observed network as a percentage of that in a star network of the same size. This is how the Freeman graph centralization measures can be understood: they express the degree of inequality or variance in our network as a percentage of that of a perfect star network of the same size" Hanneman, Riddle (2005).

<sup>40</sup> Software used in the analysis are Ucinet (6.164), Pajek (1.02), Stata (9.0), R (2.5.0) and Microsoft Visual Basic (6.3). See Borgatti, Everett, and Freeman (2002) StataCorp (2005) and R Development Core Team (2006)

<sup>41</sup> The approach here is the "exploratory data analysis" EDA following Tukey (1977).

<sup>42</sup> See Borsa Italiana 2005.

sit on two boards at the same time (or *twotimers*) making up about 10% of the total number of directors and the percentage of total directors who sit on three company boards at the same time (*threetimers*) making up about 3% over the entire period considered. The directors who sit on more than three boards at the same time (*multitimers*) are a small minority made of about 2% of total directors over the entire period considered.

### ***The Lords stay Lords, the peones stay peones***

We now move on to examine more closely the transition over time in the number of directorships. We want to understand whether and to what extent there is stability over time in the number of directorships. With reference to **Table 8** we first focus on those directors who have one directorship in any one of the nine years considered (*onetimes*). We observe here that the percentage of *onetimes* who stay in charge the following year tends to be about 80% over the nine years considered, as low as 72% between 2002 and 2003 and as high as 80% between 1998 and 1999, 2001 and 2002, and 2003 and 2004. The exit is the second most frequent probability for all the nine years considered. The third probability is for *onetimes* to move on in the following year to two directorships, although such a probability is rather rare: 42 cases out of 1427 (2.9%) from 1998 to 1999, 44 out of 1511 (2.9%) from 1999 to 2000, and so on. The probability for *onetimes* to move to three directorships is exceptional and to more than three directorships practically nonexistent (one case in nine years).

Such features are shared by the (much less numerous) category of directors who have two directorships at any given year (*twotimers*). Even in this case we start from the observation that *twotimers* tend to be stable over the period considered, as the higher probabilities are for *twotimers* to stay in charge: 64% from 1998 to 1999 as well as from 1999 to 2000, 61% from 2000 to 2001, and so on. The second probability is for *twotimers* to scale back to one directorship the following year; the third to lose both their directorships. The probability for *twotimers* to move to three directorships is rare, to four directorships exceptional, and to more than four directorships nonexistent.

Finally, we also observe from Table 8 that those directors who have three and more than three directorships (*multitimers*) only exceptionally lose all of their directorships at the same time (twelve cases over nine years for the former and nine cases for the latter).

We then draw three general conclusions with respect to Table 8. The first is that although *onetimes* and *twotimers* (whom again for brevity we define as *peones*) constitute the bulk of Italian directors, it is difficult for them at any given year to move on to three or more directorships. Second, that the



higher their number of boards the lower the probability for directors to lose all their directorships the following year, although it is also true that the higher the number of boards the lower the probability to remain in the same number of directorships the following year. Third, that for onetimers and twotimers by far the higher probability is to remain in charge the following year while only exceptionally do the multitimers lose all of their boards at the same time.

### ***Director turnover***

Such features are confirmed when we observe the director turnover. As we have seen above with reference to Table 8, over the nine years considered in our study 4270 directors sat on the Italian listed company boards while summing up the total number of directorships for the nine years as displayed in Table 4 we observe that 16897 board positions (directorships) were available. This means an average turnaround rate of 25%, which means that on average every year one director out of four leaves her position on behalf of someone else, and that such a director predominantly is a onetimer or a twotimer.

Our conclusion in this respect is that there is a duality in the Italian directorship market, which is characterised by a low mobility between two categories of directors, Lords and Peones. Moreover, both Lords and peones tend to show stability within their category, and that such stability is even more important for the multitimers.

### ***The Lords' profile***

We now move on to investigate more closely the features of those directors who have a high number of boards over the nine years considered. We saw from Table 8 that three directorships seems to represent a frontier between the (many) peones and the (few) multitimers. Since it is primarily through the latter that the Italian listed companies establish contacts with each other (Rinaldi and Vasta 2005 call them "Multilinkers"), in **Table 5** we list all the directors who in the nine-year period considered have at least 23 directorships (on average about 2.5 directorships per year). It is a group of 75 directors (out of a total of 4270 directors, as shown in Table 5, that is 1.7% of the total number of directors serving on the Italian listed company boards from 1998 to 2006), whom for brevity we identify as the Lords of the Italian stock market. The first thing we notice is that there are different patterns: there are directors who increase progressively their number of boards (for instance Carlo Pesenti, three members of the Ligresti Family), those who tend to have a stable number of directorships (Geronzi, Francesco Caltagirone) and those who decrease their presence (Gazzoni Frascara, Giampiero Pesenti, Tronchetti Provera, Guppy). Finally, there is a small number of directors who exit from the group, and this is due mainly to their passing away. Moreover, no matter the pattern

(with the obvious exception of those who pass away), changes in the number of directorships from year to year tends to be gradual. To further explore the characteristics of our 75 Lords, we listed them in **Table 6** according to their board positions. We observe that along a high number of cases in which Lords sit on their boards as "simple" directors, in an important number of cases they also sit as Ceos or as Chairpersons. Finally, 25 out of 75 Lords are also significant shareholders in one or more listed companies over the period considered.

### ***The Lords often belong to families***

Looking at Table 5 we also observe that many of the Lords belong to families, that is, many of them have relatives sitting on Italian listed company boards belonging to our sample. **Table 7** shows the number of directorships held by families of directors. We have 53 families that add up at least 23 directorships in nine years. By comparing Table 7 with Table 6 we also notice that the first five families have more than 100 directorships and that the first ten have a higher number of directorships than the first Lord. Finally even in this case we observe trends, with families rising in the number of directorships over the period considered (for instance, Caltagirone, Ligresti), families showing stability (Berlusconi, Pesenti), and families that decrease their presence on Italian corporate boards (Marzotto, Falck).

### ***Smaller boards: who takes the burden?***

From Table 9 we observe that the total number of companies increases from 228 to 257. Taking into account that (Table 4) the number of directors goes from 1705 in 1998 to 1769 in 2006, we have the average number of directors per company going from 7.4 in 1998 to 6.9 in 2006. Such a reduction in the number of directorships per company takes place in a context in which, as we have seen above, the board composition stays the same between peones and lords. At the same time (Table 4) there is a reduction in the number of multiple posts held by the Lords, particularly a reduction in the number of directors who sit on five or more boards at the same time.

### ***An all-male world***

From Table 5 we observe that out of the 75 Lords there are just three women directors with more than 23 board positions in nine years. The situation does not change if we look at the director ranking according to betweenness. Appendix 4 lists all the directors with average betweenness higher than zero. We observe that over the nine years considered there are 13 women directors out of 726 directors with average betweenness higher than zero, who mainly belong to shareholder families and of whom the first is in 28<sup>th</sup> position, the second in 34<sup>th</sup>, and the third in 242<sup>nd</sup> position. Finally, we find

three women directors in the first 200 directors according to Freeman Degree, the first in 14<sup>th</sup> position, the second in 29<sup>th</sup>, and the third in 53<sup>d</sup> position.

### **Conclusion on section 3.1**

In this section we found that about 94% of all sampled directors sit on one or two boards in every one of the nine years considered. We observed that it is difficult for such directors to move to three or more directorships. We then explored the features of those directors who have more than two directorships at any given year and therefore ensure the bulk of the connectivity among the Italian listed companies. We found a group of 75 directors out of a total of 4270 directors who over the nine years considered have at least 23 directorships (on average about 2.5 every year), whom for brevity we defined as Lords of the Italian stock market. They are overwhelmingly male (just three female directors among the 75 Lords) and in an important number of cases they are Chairmen or Ceos and one third of them are also significant shareholders in one or more listed companies. Starting from the observation that Lords tend to belong to families of directors, we found 53 families that add up at least to 23 directorships in nine years. The first five families have more than 100 directorships and the first ten have a higher number of directorships than the first Lord.

### **3.2. The Company Network**

The approach used in this section is the social network analysis (SNA), which studies and analyses quantitatively different kinds of social networks. In this context a social network is a mathematical model to represent the relationships among a plurality of actors, for instance the network of countries that participate in international trade.<sup>43</sup> In our case we apply SNA to three social networks: directors, companies, Blue Chip companies over the 1998-2006 period.

#### ***Components***

We start examining the features of the listed companies that are connected by the directors who sit on more than one board. Looking at Table 9 we notice is that very few companies are not connected by their directors. The Italian stockmarket is characterised by the existence of a large component which is made of more than 70% of the listed companies belonging to our sample. Other components are peripheral and made of very few members: they never exceed 1% of total companies sampled. The first component is very numerous, it goes from 73% in 1998 to 76% in 2006 of the total number of the Italian listed companies sampled. This represents a first hint about the possible presence of collusion in the Italian stock market, since we have evidence here of the existence and stability over time of a

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<sup>43</sup> See Wasserman and Faust (1994).

single company network, which can be used as a communication tool. According to the theory of pure monitoring seen above in the introduction we would have expected to see several separate subgroups of companies. Over the time we observe a stability in the number of isolates but a reduction in their incidence, from the initial 53 (23%) to 47 (18%) in 2006.

### ***Density***

Given a specified number of companies and of directors, density indicates the ratio between the number of ties and its total possible number.<sup>44</sup> A tie is a link between two companies established through their having a director in common or between two or more directors sitting on the same board. The higher the density of a network of companies or directors, the higher the number of links among the companies or directors. Moreover, the more numerous the directors who connect the companies belonging to the examined network, the higher the network density. From **Table 10** we observe a progressive decrease in the density level of all the sampled Italian listed companies from 1998 to 2006. Such decrease is more important for the Italian Blue Chips, identified according the MIB 30 Index until 2002 and the S&P-MIB 40 Index which was introduced in 2003. Over the nine years considered, the system of the Italian Blue Chips decreases in about 50% of its density, which means that in 2006 the system is less interconnected and the network of interlocking directors less dense. The decrease in both cases could be connected with the decrease in number of multiple directorships observed above. The more important decrease for the Italian Blue Chips could be related to the fact that directors multi-timers are more present in the Blue Chips. However, we also observe that although, as said, the density decreases much more in the case of the Blue Chips, even in 2006 the density of the Italian Blue Chips continues to be significantly higher than the total companies sampled: about six times more (0.0242 against 0.1579). this is also consistent with the observation that multitimers tend to sit on Blue Chips' boards.

### ***Geodesic distance (degrees of separation)***

It is the distance between any two different companies as measured through the number of directors connecting such two companies (see Wasserman and Faust, 1994). In general terms, the geodesic distance increases in correspondence with the difficulty of communication between any two companies. It should be also kept in mind that this is an indicator of potential communication which does not mean that all the companies actually communicate. From **Table 12** we observe that the average distance between two Italian listed companies tends to be around 3, which means that on average any two Italian listed companies which belong to the first component of the network (which, as we have

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<sup>44</sup> See Wasserman and Faust (1994).

seen above, includes from 1998 to 2006 between 73% and 79% of the total number of our sampled listed companies) are linked through three other companies. More in particular, from 1998 to 2006 we observe a stability in the geodetic distance, which means that the company network formed by the first component over time tends to have a stable diameter.

### ***Conclusion on section 3.2***

The great majority of the Italian listed companies belong to the same component formed through a network of director interlocks.<sup>45</sup> Such component tends to be stable over all the nine years considered: it goes from 73% in 1998 to 76% in 2006 of the total number of the Italian listed companies sampled. The first component also shows stability over time with respect to its geodesic distance, that is the distance between any two different companies as measured through the number of directors connecting any two companies. We find that on average any two Italian listed companies belonging to the first component are linked through three other companies. We also observe a decreasing density for both all the companies sampled and the Blue Chips, with a much more important decrease for the latter. However, the density stays significantly lower for the Italian listed companies with respect to the Italian Blue Chips. This means that the Italian Blue Chips are characterised by a higher number of links formed through director interlocks. The conclusion is that the system remains stable over the nine years considered (first component and geodesic distance), with signs of decrease in density particularly for the Blue Chips which could be linked to the decrease in the number of high multilinkers (more than five boards at the same time), who tend to sit on the Blue Chips' boards.

### **3.3. Company and director connectivity (Freeman degree and betweenness)**

We now continue examining the features of the company network made of those Italian listed companies that belong to the first component (see above). It is interesting to identify whether there are companies that play a pivotal role, that is which companies are the necessary nodes to ensure the the communication of all the listed companies involved.

We make recourse to two measures of interconnection, Freeman Degree and Betweenness. The Freeman Degree is a measure of local centrality, that is the potentiality to act or communicate with a specified number of directors. The Freeman Degree identifies the extent of connections of a director or of a company. A high Freeman Degree can correspond to a low or high level of centrality with respect to the entire network. We also make recourse to the indicator called Betweenness which is a

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<sup>45</sup> In rigorous terms, the term company network should be used to identify all the Italian listed companies, that is all the companies belonging to our population.

measure of centrality within the entire network. Betweenness indicates the number of paths that pass through a node. In this context, a node indicates a company, and a path indicates the shortest route which relies two companies through board interlocks. Betweenness is a complementary measure with respect to the Freeman Degree because it allows to specify whether a director or a company have a central or peripheral position within the entire network.

### *Freeman Degree*

**Table 13** illustrates the ranking of the first ten Italian listed companies according to their Freeman Degree. We observe a general stability in the top companies all over the period considered, with the constant presence of Pirelli, Mediobanca, Ras (delisted in 2006), and so on. However, over the time there are new entries, for instance RCS and Fondiaria from 2003, Alleanza Assicurazioni and Atlantia in 2006. On the exits side, HOPA leaves the group in 2003, and Gim in 2005. In general, the turnover in the first ten companies by Freeman degree is very low, and the ranking tends to remain the same.

### *Betweenness*

**Table 16** lists the first ten directors by betweenness over the nine years of our study. We first observe that there is stability over time in the directors belonging to this top-ten list, which means that the network tends to have the same directors at its centre. However, there are also exits from the group (Gutty, Marzotto, Falck) and entries (Grande Stevens, Benetton, Ligresti, Pesenti). Moreover, the directors belonging to this list tend to be those who have also a higher number of boards (Table 6). However, the two categories do not correspond exactly because a high level of betweenness is obtained only by having a high number of directorships in central positions. On the contrary, directors sitting in many peripheral boards have a lower level of betweenness, and directors with a low number of directorships can have a high level of betweenness. We also observe that several of the top-ten directors belong to the first director families listed in Table 7. Finally, we observe that over the nine years in several cases more than one member of the same family appears in this list (Ligresti, Pesenti, Benetton).

**Table 14** illustrates the ranking of the first ten Italian listed companies according to their betweenness for each year within the period considered (see **Appendix 3** for a complete list of company betweenness over the period considered). Even in this case we observe a general stability in the top companies over the period considered, with the constant presence of Pirelli, Telecom Italia, Mediobanca, Ras (delisted in 2006), and so on. However, over the time there are new entries, for instance Fondiaria in 2000, Alleanza Assicurazioni in 2005, and Sanpaolo IMI and Atlantia in 2006.

On the exits side, HOPA leaves the group in 2003, and Snia in 2004. In general, the turnover in the first ten network companies by betweenness is very low, and the rankings tend to remain the same. Finally, we observe that the group of the first directors (Table 16) tend to belong to these top-ten companies.

### ***Company scandals***

We now move on to make use of the tools developed in this paragraph to illustrate the development of some of the most important company scandals which took place in the period covered by this study (1998-2006). For the identification of such events we refer to Consob yearly reports (see Consob 1998-2007). We refer to Appendix 1 for board size and to Appendix 3 for company betweenness.

#### *Parmalat*

We start examining Parmalat's board size previously to its financial crisis which took place in 2003 (see Consob 2004, p. 35 and p. 60). We notice that from 1998 to 1999 the board was made of 15 directors. In 2000 the board size falls to 13 members, that is by 13%. In the same year we observe that Parmalat's betweenness falls by a much higher proportion. We also observe a first decrease in the company betweenness already in 2000 (from 635 in 1999 to 417 in 2000) and a second one in 2001 (to 36). The conclusion is that Parmalat sees a decreasing level of betweenness previous to the company insolvency and that the main factor in the reduction in betweenness is attributable to the change in the board composition rather than to the reduction of the board size. In 2002 the board size stays the same while the company betweenness keeps to a low level (77).

#### *Cirio*

Over the previous years to its insolvency which took place in 2003 (see Consob 2004, p. 35 and p. 60), Cirio witnesses a reduction in its board size, from 15 members in 1998 to 13 in 1999, 8 in 2000, 9 in 2001, and 8 in 2002. Over this same period the company betweenness stays between zero and a very low level (14 in 2002 and 18 in 2003).

#### *Unipol*

The Unipol scandal broke out in 2005 (Consob 2006, p. 82).

Unipol board size remains stable over the entire 1998-2006 period between 24 and 25 members.

The evolution of the Unipol betweenness reaches its maximum in 2003 (446) with an ensuing decrease in 2004 and again in 2006.

*Banca Popolare di Lodi (since 2004 Banca popolare italiana)*

The scandal broke out in 2005 (Consob 2006, p. 67 and p. 85).

The Board size of the bank increases from 14 members in 1998 to 16 in 1999 and to 17 in 2002, to get back to 16 in 2005. As for the company betweenness, we observe the same trend as for Unipol: BPL/BPI betweenness reaches its maximum betweenness in 2003, followed in 2004 by a significant decrease.

### ***Conclusion on section 3.3***

We compare the ranking of the first ten companies according to Freeman Degree (a measure of local centrality, that is the potentiality to act or communicate with a specified number of directors) with the ranking of the first ten companies by betweenness (which allows to specify whether a company has a central or peripheral position within the entire network). We find that both rankings tend to be stable over the nine years, and that the companies that make up both rankings tend to be the same, which means that the companies that have a higher number of connections with other companies also have a central position within the entire network.

### **3.4. The main banking and insurance companies: a group of very close friends**

We saw in section 3.2 that the Italian Blue Chips are characterised by a much higher density than the rest of the Italian listed companies. We now focus on board interlocks among the financial companies (banks and insurance companies) belonging to the MIB 30/S&P MIB 40 index over the nine years considered. Financial companies are by far the most important subgroup among the Italian Blue Chips: from 13 companies out of 30 in 1998 to 15 out of 40 in 2006. From **Table 18** we observe that in 1998 nine financial companies were connected through one to six interlocking directors, with two other companies linked with each other through two directors in common. In 1999 such web increases to ten members, plus three more companies separately connected with each other. The picture stays the same over the following years with the main web reaching 12 members in 2005 plus two other members separately linked with each other. Over the nine years, only one to three financial companies are not linked with any other financial companies of the index (they are represented in Table 18 as isolates). From Table 18 we also observe the persistent centrality of Mediobanca which also keeps a high number of directors in common with Generali, Unicredito, Ras (delisted in 2006), Banca Intesa, and Capitalia (merged with Unicredito in 2007). As the main dynamic factor we observe in the last years a reduction in the number of interlocks which corresponds to the reduction in the number of multiple boards held by the 75 Lords as observed in section 3.1. Such reduction does not correspond



to a reduction in the members of the web but in their concentration, particularly in 2005 and 2006, around Mediobanca.

#### 4. Conclusion

The purpose of this paper is to contribute to the literature on country interlocks by illustrating and analysing the interlocking directorships in the Italian stock market from 1998 to 2006. The existing literature already identifies director interlocks as a structural feature of the Italian capitalism since the end of the 19<sup>th</sup> century, with possible consequences in terms of collusion and restrictions to competition.

We find that about 94% of all sampled directors sit on one or two boards in every one of the nine years considered. We observe that it is difficult for such directors to move to three or more directorships. We then explore the features of those directors who have more than two directorships at any given year and therefore ensure the bulk of the connectivity among the Italian listed companies. We find a group of 75 directors out of a total of 4270 directors who over the nine years considered have at least 23 directorships (on average about 2.5 every year). We define them for brevity the Lords of the Italian stock market. They are overwhelmingly male (just three female directors among the 75 Lords) and in an important number of cases they are Chairmen or Ceos; one third of them are also significant shareholders in one or more listed companies. Starting from the observation that Lords tend to belong to families of directors, we find 53 families that add up at least to 23 directorships in nine years. The first five families have more than 100 directorships and the first ten have a higher number of directorships than the first Lord.

At the company level, the great majority of the Italian listed companies belong to the same component formed through a network of director interlocks.<sup>46</sup> Such component tends to be stable over all the nine years considered: it goes from 73% in 1998 to 76% in 2006 of the total number of the Italian listed companies sampled. The first component also shows stability over time with respect to its geodesic distance, that is the distance between any two different companies as measured through the number of directors connecting any two companies. On average any two Italian listed companies belonging to the first component are linked through three other companies. We also observe a decreasing density for both all the companies sampled and the Blue Chips, with a much more important decrease for the latter. However, the density stays significantly lower for the Italian listed companies with respect to the Italian Blue Chips. This means that the Italian Blue Chips are characterised by a higher number of

links formed through director interlocks. The conclusion is that the system remains stable over the nine years considered (first component and geodesic distance), with signs of decrease in density particularly for the Blue Chips which could be linked to the decrease in the number of high multilinkers (more than five boards at the same time), who tend to sit on the Blue Chips' boards.

We then compare the ranking of the first ten companies according to Freeman Degree (a measure of local centrality, that is the potentiality to act or communicate with a specified number of directors) with the ranking of the first ten companies by betweenness (which allows to specify whether a company has a central or peripheral position within the entire network). We find that both rankings tend to be stable over the nine years, and that the companies that make up both rankings tend to be the same, which means that the companies that have a higher number of connections with other companies also have a central position within the entire network.

The highest level of connectivity concerns those companies that belong to the MIB 30/S&P-MIB 40 index, the Italian Blue Chips. In particular, practically all the financial companies that make up the great part of such group belong to the same web of companies established through common directors.

Between 1998 and 2006 changes have concerned only that the modality in which the connectivity is realised, from a web of companies with a redundancy of links with each other to a much more efficient system in which communication is channelled through a smaller number of companies. If we consider that such trends take place through the same hub-directors who merely reduce their multiple engagements, the conclusion seems to point to a higher level of efficiency in ensuring the connectivity of the system rather than to a lower level of communication among the Italian listed companies.

The extent, depth, and stability of the connections among the Italian listed companies, and in particular the main Italian financial companies, raise doubts on the extent of their competitive behaviour.

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<sup>46</sup> In rigorous terms, the term company network should be used to identify all the Italian listed companies, that is all the companies belonging to our population.

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**Table 1. The function of interlocks. Review of the empirical evidence (Haunschild Beckman (1998) et al.)**

<b>Authors</b>	<b>Results</b>	<b>Methodology</b>
Elouaer 2006, Dooley 1969	“Financial Interlocks occurs for several reasons. First, companies that are in financial difficulty tend to form a close association with one or more financial houses. Second, banks find it advantageous to be connected with large firms through electing company officers to the bank’s board of directors; this may attract large deposits as well as secure a reliable customer for bank loans. Third, these financial interlocks also arise from the trust operations of banks (Dooley [1969])”	
Koenig, Gogel, and Sonquist, 1979; Burt, 1983	Mechanism for interfirm collusion and cooperation	
Pfeffer and Salancik, 1978; Kotz, 1978; Mizruchi, 1982; Mizruchi and Stearns, 1994	They enable firms (especially banks) to reduce dependence or coopt, control, and/or monitor others	
Zeitlin, 1974; Palmer, 1983 Radcliff 1980	They promote upper-class cohesion and capital accumulation	
Zajac, 1988 Kramarz Thesmar, 2006	They are a mechanism for personal career advancement	
Selznick, 1957; DiMaggio and Powell, 1983	They are a source of legitimacy	
Useem, 1984; Davis, 1991; Haunschild, 1993) (for a review, see Mizruchi, 1996)	They are a source of information about business practices	
Barucci 2006	“Alleanze industriali, relazioni con fornitori \ clienti rapporto banca-impresa. Stabilizzazione del controllo tramite rapporti personali, controllo da parte della capogruppo, limitare la concorrenza, benefici privati del controllo e dell’amministratore, consolidamento di rendite di posizione”	

**Table 2. The Econometric evidence: impact of interlocks and determinants**

<b>Authors</b>	<b>Results</b>	<b>Methodology</b>
Autori vari in Barucci 2006	Probabilità di cambiamento dell’amministratore delegato è legata negativamente alla performance della società	
Interlocking and shareholder value Varie ipotesi in Barucci 2006 Pag.52-55	Negative. Interlocks related to personal advantages of directors.	
Interlocking and shareholder value Varie ipotesi in Barucci 2006 Pag.52-55	Positive. Interlocks related to leverage of the firm (Bank director in board of a not financial high leveraged form)	

**Table 3. Empirical results in the literature by country network.**

Country/year	Author	Results	Methodology
Australia (1976/1996)	Malcolm (2003)	“The interpersonal network of 1996 is broader, more cohesive and more densely connected than that of 1976. However, there is only minimal change in the density of intercorporate linkages over these two decades”	Network analysis (directors)
Canada	Ornstein (2003)	“The Canadian network is neither unusually sparse nor fragmented; there is no pronounced cleavage between, or subordination of, non-financial corporations to financial corporations; nor do the foreign-controlled corporations constitute an alternative centre or fragment of the network. It resembles the networks of countries such as Germany and France”	
Europe (2000/2001/2002/2003)	Guieu Meschi (2006)	“La base de regroupement reste largement nationale, les liens internationaux n’ayant aucunement de caractère systématique. Si liens internationaux il y a, ces liens restent sporadiques, centrés sur quelques individus. Un administrateur peut être international (comme c’est le cas par exemple de B. Collomb, de M. Treschow ou d’A. Bernheim), les réseaux le sont peu”	Network analysis, Descriptives
Europe/Various countries	Rodríguez, Cárdenas, Oltra (2003)	“Existe claramente una Europa de poder económico multinacional y un espacio económico multinacional que son el resultado de la acción de un reducido grupo de propietarios internacionales.”	
Europe/ Various countries	Rodríguez, Cárdenas, Oltra (2003)	“We can point to some different models of class and power”	
France (1996/2000)	Chabi, Maati (2005)	Existence of a Small world.	Matching Small World phenomenon

France (1996/2005)	Elouaer (2005)	Centrality of financial institutions. Big companies tend to be more central. "Less dense network in 2005".	Network analysis (directors and companies)
FTSE 100 (2005)	Maati (2007)	Existence of a Small world	Matching Small World phenomenon
Germany (1989/2001)	Heinze (2004)	"Qualitative dissolution of interlocking directorates"... "This process of quantitative erosion did not yet affect considerably structural properties of the networks". Centrality of financial institutions.	Network analysis
Ireland	Mac Canna, Brennan, O' Higgins (1998)	"Network of interlocking directorates is in some way structured, and not the result of random processes... Irish boards were found to have a relatively loosely connected network structure which is sparser and less dense than those of other countries. This is reflected in the relatively low percentage of multiple directors and the relatively fewer number of directorships per multiple director. In general, indigenous Irish public companies tended to be central in the network, while a disproportionately large number of foreign and private companies were isolated on the periphery. However, a number of foreign-owned companies were central to the network"	Matching Small World phenomenon
Italy (1952/1960/ 1972)	Rinaldi Vasta (2005)	"In 1952 and 1960, the system, centred on the larger electrical companies, showed the highest degree of cohesion. This centre dissolved after the nationalisation of the electricity industry in 1962 and was replaced by a new and less cohesive one, hinged on financial intermediaries: banks, insurance and finance companies. More generally, contrary to conventional wisdom, we argue that banks maintained an important role throughout the period investigated"	Descriptives

Italy (1970/1990)	Aguilera (2006)	Overall static structure (1970-1990). Existence of a small world	Network analysis Matching Small World phenomenon.
Italy (1983/1998)	Barbi (2000)	“A decreasing trend in overlapping membership in order to support block-holders is given by a decrease in density as well as by an increase in the asymmetry of links distribution”	Network analysis/Concentration analysis
Italy (1990/2000)	Corrado Zollo (2006)	“Stability of Small World coefficients”. Fragmentation of the system. Relative stability of the key players.	Network analysis (Ownership network)
Italy (2004)	Carbonai Di Bartolomeo (2006)	“The Italian insurance industry is characterized by a low degree of competition. This paper provides some evidence to the idea that the absence of competition is due to a violation of a basic assumption”	Graph Theory, Principal Component Analysis (interlocking directors Insurance companies)
Italy (1999/2000/2001/2002/2003/2004)	Bertoni Randone (2006)	Existence of a Small World	Matching Small World phenomenon (Company and Ownership networks)
Italy (2004)	Casaleggio (2004)	Existence of a Small World	
Italy (2006)	Murgia (2006)	Higher level of companies isolates. Higher percentages of multiple directorships.	Network analysis (IT directors companies in Lazio)
Netherlands (1960/1964/1969/1972/1976/1980)	Stokman et al (1990)	Reducing interlocks per multiple director. Increasing the density of the network.	Network descriptive statistics

New Zealand (2004)	Stablein et. al. (2004)	Existence of a Small World	Matching Small World phenomenon
Singapore (1997)	Ong, Chin Huat, Wan, David and Ong, Kee-Sing (2003)	Firm size correlated with interlocking directorships. Financial companies share an higher level of interlocks with not financial companies	Network explorative analysis
Singapore (2005)	Conyon Muldoon (2006)	Existence of a Small World	Matching Small World phenomenon
Spain (1970/1990)	Aguilera (2006)	Large changes over the time (1970-1990). Existence of a small world	Network analysis. Matching Small World phenomenon
USA	Davis Yoo et Baker (2002)		
USA (1982,1990, 1999)	Davis Yoo et Baker (2003)	Stability of the aggregate connectivity. Existence of a small world	Network analysis. Matching Small World phenomenon
USA (1990,2001)	Davis Yoo et Vast (2003)	Existence of a small world in 1990 and 2001)	Matching Small World phenomenon

**Table 4. Number of directorships by director 1998-2006: Italian listed companies**

<b>1998</b>				<b>1999</b>				<b>2000</b>			
<b>boards</b>	<b>directors</b>	<b>perc.</b>	<b>cumul.</b>	<b>boards</b>	<b>directors</b>	<b>perc.</b>	<b>cumul.</b>	<b>boards</b>	<b>directors</b>	<b>perc.</b>	<b>cumul.</b>
10	0	0	0	10	1	0.06	0.06	10	0	0	0
9	0	0	0	9	1	0.06	0.12	9	1	0.05	0.05
8	3	0.18	0.18	8	2	0.11	0.23	8	3	0.16	0.21
7	2	0.12	0.3	7	3	0.17	0.4	7	4	0.22	0.43
6	8	0.47	0.77	6	6	0.33	0.73	6	5	0.27	0.7
5	8	0.47	1.24	5	13	0.72	1.45	5	12	0.65	1.35
4	20	1.17	2.41	4	17	0.94	2.39	4	20	1.09	2.44
3	65	3.81	6.22	3	73	4.04	6.43	3	65	3.54	5.98
2	172	10.09	16.31	2	182	10.06	16.49	2	190	10.35	16.33
1	1427	83.7	100	1	1511	83.53	100	1	1535	83.65	100
Total	1705				1809				1835		
<b>2001</b>				<b>2002</b>				<b>2003</b>			
<b>boards</b>	<b>directors</b>	<b>perc.</b>	<b>cumul.</b>	<b>boards</b>	<b>directors</b>	<b>perc.</b>	<b>cumul.</b>	<b>boards</b>	<b>directors</b>	<b>perc.</b>	<b>cumul.</b>
9	1	0.05	0.05	9	3	0.16	0.16	9	0	0	0
8	3	0.16	0.21	8	0	0	0.16	8	2	0.11	0.11
7	0	0	0.21	7	2	0.11	0.27	7	3	0.16	0.27
6	5	0.27	0.48	6	8	0.43	0.7	6	6	0.33	0.6
5	16	0.86	1.34	5	12	0.64	1.34	5	10	0.55	1.15
4	17	0.91	2.25	4	16	0.86	2.2	4	24	1.32	2.47
3	60	3.23	5.48	3	49	2.62	4.82	3	52	2.86	5.33
2	197	10.6	16.08	2	211	11.28	16.1	2	198	10.89	16.22
1	1559	83.91	100	1	1569	83.9	100	1	1524	83.78	100
Total	1858				1870				1819		
<b>2004</b>				<b>2005</b>				<b>2006</b>			
<b>boards</b>	<b>Directors</b>	<b>perc.</b>	<b>cumul.</b>	<b>boards</b>	<b>directors</b>	<b>perc.</b>	<b>cumul.</b>	<b>boards</b>	<b>directors</b>	<b>perc.</b>	<b>cumul.</b>
8	1	0.06	0.06	8	0	0	0	8	0	0	0
7	3	0.17	0.23	7	0	0	0	7	1	0.05	0.05
6	5	0.28	0.51	6	13	0.62	0.62	6	3	0.14	0.19
5	13	0.72	1.23	5	14	0.67	1.29	5	13	0.62	0.81
4	28	1.54	2.77	4	21	1.01	2.3	4	33	1.57	2.38
3	47	2.59	5.36	3	76	3.64	5.94	3	63	3.01	5.39
2	205	11.29	16.65	2	229	10.96	16.9	2	214	10.21	15.6
1	1514	83.37	100	1	1736	83.1	100	1	1769	84.4	100
Total	1816				2089				2096		



**Table 5. Directors with more than 23 directorships in nine years (1998-2006)**

COGNOME NOME	1998	1999	2000	2001	2002	2003	2004	2005	2006	Total
GRANDE STEVENS FRANZO	7	8	8	8	7	8	7	6	4	63
EREDE SERGIO	8	10	9	5	5	5	5	6	7	60
PESENTI GIAMPIERO	8	7	7	6	6	6	6	5	4	55
BENETTON GILBERTO	3	3	4	8	9	8	7	6	6	54
DE BENEDETTI CARLO	5	7	7	6	6	6	6	6	4	53
TRONCHETTI PROVERA MARCO	6	9	8	9	6	4	4	4	3	53
MION GIANNI	3	3	3	8	9	7	8	5	5	51
PESENTI CARLO	3	5	6	4	6	6	6	6	6	48
GUATRI LUIGI	4	4	4	5	6	6	6	6	5	46
BUORA CARLO	2	3	3	6	9	7	7	6	2	45
CARLEVARIS CARLO	5	5	5	5	5	5	5	5	5	45
GALATERI DI GENOLA E SUNIGLIA GABRIELE	6	6	6	5	3	4	4	6	5	45
GIRARD FRANCO ROBERTO	5	5	5	5	5	5	5	5	4	44
DELFINI MARIO	4	3	5	5	5	5	5	5	5	42
PURI NEGRI CARLO ALESSANDRO	3	4	3	5	7	6	5	5	4	42
ROCCA GIANFELICE	4	4	5	4	5	5	5	5	4	41
DE BENEDETTI RODOLFO	4	5	4	4	4	4	5	5	4	39
PIRELLI ALBERTO	4	3	4	5	6	4	4	4	4	38
BAZOLI GIOVANNI	5	4	4	4	4	4	4	4	4	37
BENETTON ALESSANDRO	3	5	6	4	4	4	4	4	2	36
COLOMBO UMBERTO	4	5	5	5	5	5	4	3		36
FALCK ALBERTO	8	8	8	6	6					36
GRECO MARIO	1	1	3	5	6	6	5	3	5	35
SEGRE MASSIMO	2	3	3	3	4	4	4	6	6	35
LIGRESTI JONELLA	2	2	2	3	3	5	6	6	5	34
LUCCHINI GIUSEPPE	5	5	4	4	4	4	4	2	2	34
MOLINARI AMATO LUIGI	3	3	2	3	4	5	5	6	3	34
RUOZI ROBERTO	2	3	3	3	4	4	4	6	5	34
GUTTY GIANFRANCO	7	7	7	6	2	2		1	1	33
PECCI ALBERTO	5	6	5	4	2	2	3	3	3	33
VITALE MARCO	2	2	3	4	5	5	4	4	4	33
SAVIOTTI PIERFRANCESCO	4		3	5	5	4	4	3	4	32
COLANINNO ROBERTO	3	6	6	2	1	3	3	3	4	31
D'URSO CARLO	3	3	3	3	4	4	3	4	4	31
FERRERO PIERLUIGI	2	3	3	4	4	4	4	4	3	31
CEFIS GIORGIO CAMILLO MARCELLO	4	5	5	4	4	2	2	2	2	30
ORLANDO LUIGI	6	5	5	5	5	3	1			30
TAMBURINI MATTEO		2	4	3	3	4	4	5	5	30
ZANON DI VALGIURATA LUCIO IGINO	4	4	4	3	3	3	3	3	2	29
FABRIZI PIER LUIGI	2	3	3	5	5	3	3	3	1	28
LIGRESTI GIULIA MARIA	1	1	1	2	3	5	5	5	5	28
BERLUSCONI MARINA ELVIRA	3	3	3	3	3	3	3	3	3	27
CATTANEO MARIO	2	3	3	3	3	4	4	3	2	27
CLO' ALBERTO	1	2	2	2	2	3	5	5	5	27
DALLOCCHIO MAURIZIO	1	1	2	3	3	4	5	6	2	27
MARZOTTO PIETRO	6	5	4	4	4	3	1			27
ACUTIS CARLO	2	2	2	2	2	3	4	4	5	26
BERNHEIM ANTOINE	2	2	2	2	3	3	4	4	4	26
CALTAGIRONE FRANCESCO	4	3	2	2	2	3	3	3	4	26

LIGRESTI GIOACCHINO PAOLO	1	1	1	2	2	7	4	4	4	26
PERISSINOTTO GIOVANNI		1	1	2	3	4	5	5	5	26
SOZZANI VINCENZO	6	4	3	2	3	3	3	2		26
GAZZONI FRASCARA GIUSEPPE	6	5	4	3	1	1	2	2	1	25
MAJORE ALBINO	2	2	3	3	3	3	3	3	3	25
MINUCCI ALDO	1	2	3	3	3	3	3	3	4	25
NATTINO GIAMPIETRO	3	2	1	3	4	3	3	3	3	25
REBOA MARCO	1	2	2	2	2	4	4	4	4	25
BIANCHI TANCREDI	3	4	5	5	2	2	1	1	1	24
BONDI ENRICO	5	6	4	4	3			1	1	24
CIPOLLETTA INNOCENZO	3	3	2	4	3	2	3	2	2	24
FAVRIN ANTONIO	1	1	1	2	3	4	4	5	3	24
GERONZI CESARE	2	3	3	3	3	2	3	3	2	24
MARTINELLI FELICE	1	2	3	3	3	3	3	3	3	24
RIPA DI MEANA VITTORIO	3	3	3	3	5	2	2	2	1	24
ROSA UMBERTO	3	3	1	1	2	2	4	4	4	24
SCIUME' PAOLO	3	3	3	3	3	3	2	2	2	24
TEODORANI FABBRI PIO	2	2	2	3	3	3	3	3	3	24
ARCELLI MARIO	4	4	4	4	4	3				23
BRUNETTI GIORGIO	2	2	2	3	3	3	2	3	3	23
CALTAGIRONE FRANCESCO GAETANO	1	1	2	3	3	4	3	3	3	23
FERRERO CESARE	1	1	1	4	4	4	3	3	2	23
MARAMOTTI ACHILLE	3	3	3	5	3	3	3			23
MARCHIO' ANGELO	6	6	7	2	1	1				23
PININFARINA ANDREA	3	3	2	2	3	2	3	3	2	23
RONDELLI LUCIO	4	4	5	2	2	1	1	2	2	23

**Table 6. Directors with more than 23 directorships in nine years (1998-2006): board positions**

The last column indicates with the letter S those directors who are also significant shareholders (more than 2% shares) in one or more listed companies over the period considered

COGNOME NOME	AD	AMM	PR	PRAD	VPR	VPRAD	Total	Sign SHS
GRANDE STEVENS FRANZO		56	3		4		63	
EREDE SERGIO		49	7		4		60	
PESENTI GIAMPIERO	6	37	3	9			55	S
BENETTON GILBERTO		34	9		8	3	54	S
DE BENEDETTI CARLO		24	29				53	S
TRONCHETTI PROVERA MARCO	1	17	27	5	1	2	53	S
MION GIANNI		48			3		51	
PESENTI CARLO	3	45					48	S
GUATRI LUIGI		36	10				46	
BUORA CARLO	12	28	3		1	1	45	
CARLEVARIS CARLO		32	9		4		45	
GALATERI DI GENOLA E SUNIGLIA GABRIELE	8	27	4		6		45	
GIRARD FRANCO ROBERTO		41			3		44	
DELFINI MARIO		33	5		4		42	
PURI NEGRI CARLO ALESSANDRO		24			13	5	42	S
ROCCA GIANFELICE		40			1		41	S
DE BENEDETTI RODOLFO	18	19	2				39	S
PIRELLI ALBERTO		25			13		38	S
BAZOLI GIOVANNI		10	18		9		37	

BENETTON ALESSANDRO		34			2		36	S
COLOMBO UMBERTO		36					36	
FALCK ALBERTO		28	8				36	S
GRECO MARIO	7	27			1		35	
SEGRE MASSIMO		35					35	
LIGRESTI JONELLA		16	6		12		34	S
LUCCHINI GIUSEPPE		32			2		34	S
MOLINARI AMATO LUIGI		32	2				34	
RUOZI ROBERTO		26	8				34	
GUTTY GIANFRANCO		25		1	4	3	33	
PECCI ALBERTO		29	4				33	
VITALE MARCO		26	1		6		33	
SAVIOTTI PIERFRANCESCO	1	30			1		32	
COLANINNO ROBERTO	5	16	6	3	1		31	S
D'URSO CARLO		22	5		4		31	
FERRERO PIERLUIGI		31					31	
CEFIS GIORGIO CAMILLO MARCELLO	10	20					30	S
ORLANDO LUIGI		18	11	1			30	S
TAMBURINI MATTEO		30					30	
ZANON DI VALGIURATA LUCIO IGINO		29					29	
FABRIZI PIER LUIGI		16	8		4		28	
LIGRESTI GIULIA MARIA		19	2	3	4		28	S
BERLUSCONI MARINA ELVIRA		23	4				27	S
CATTANEO MARIO		27					27	
CLO' ALBERTO		27					27	
DALLOCCIO MAURIZIO		18	9				27	
MARZOTTO PIETRO		27					27	S
ACUTIS CARLO		17			9		26	S
BERNHEIM ANTOINE		13	6		7		26	
CALTAGIRONE FRANCESCO		15	11				26	S
LIGRESTI GIOACCHINO PAOLO		15	2		9		26	S
PERISSINOTTO GIOVANNI	6	19	1				26	
SOZZANI VINCENZO		25			1		26	
GAZZONI FRASCARA GIUSEPPE		25					25	
MAJORE ALBINO		25					25	
MINUCCI ALDO		25					25	
NATTINO GIAMPIETRO	4	19	2				25	S
REBOA MARCO		25					25	
BIANCHI TANCREDI		24					24	
BONDI ENRICO	11	5	5		3		24	
CIPOLLETTA INNOCENZO		21	3				24	
FAVRIN ANTONIO	3	5	8		5	3	24	
GERONZI CESARE		9	9		6		24	
MARTINELLI FELICE		24					24	
RIPA DI MEANA VITTORIO		22			2		24	
ROSA UMBERTO		8	8	6	2		24	
SCIUME' PAOLO		15			9		24	
TEODORANI FABBRI PIO		21			3		24	
ARCELLI MARIO		23					23	
BRUNETTI GIORGIO		23					23	
CALTAGIRONE FRANCESCO GAETANO		6	16		1		23	S
FERRERO CESARE	3	20					23	

MARAMOTTI ACHILLE		15			8		23	
MARCHIO' ANGELO		19	4				23	
PININFARINA ANDREA	4	17		1		1	23	S
RONDELLI LUCIO		15	5		3		23	

**Table 7. Families with more than 23 directorships in nine years (1998-2006)**

COGNOME NOME	1998	1999	2000	2001	2002	2003	2004	2005	2006	Total
BENETTON	9	12	14	16	17	16	15	14	12	125
CALTAGIRONE	10	9	12	13	13	15	15	15	18	120
DE BENEDETTI	10	15	13	12	12	12	13	13	10	110
PESENTI	11	12	13	10	12	12	12	11	10	103
MARZOTTO	17	15	15	13	14	11	9	4	2	100
ORLANDO	12	12	12	12	12	10	10	8	7	95
LIGRESTI	4	4	4	7	8	17	15	15	14	88
LUCCHINI	11	13	13	9	9	8	8	7	8	86
TRONCHETTI PROVERA	7	10	9	11	9	7	7	7	6	73
BUZZI	10	10	11	8	5	5	5	6	6	66
FALCK	10	10	11	6	7	2	4	4	4	58
PININFARINA	8	8	6	5	7	6	7	6	4	57
ROSINA	4	5	6	6	6	5	4	6	7	49
BERLUSCONI	6	5	5	5	5	5	5	5	5	46
GALATERI DI GENOLA E SUNIGLIA	6	6	6	5	3	5	4	6	5	46
ZUCCHI	7	7	7	4	4	4	4	5	4	46
AGNELLI	5	5	5	5	5	5	4	5	6	45
GAVAZZI	6	7	7	6	4	3	3	3	3	42
ROMITI	3	5	7	5	5	6	3	4	3	41
DELLA VALLE	1	0	4	4	4	5	7	8	7	40
CARRARO	5	5	4	4	4	4	4	4	4	38
COLANINNO	3	6	6	2	1	4	4	4	8	38
GABETTI	5	4	4	4	4	4	5	4	4	38
CEFIS	5	5	5	5	5	3	2	2	2	34
NATTINO	4	3	2	4	5	4	4	4	4	34
VENDER	4	4	4	4	4	4	4	3	3	34
CRAGNOTTI	6	6	6	6	6	2	0	0	0	32
GARRONE	5	3	3	3	3	3	3	4	5	32
TREVISANI	0	4	4	4	4	4	4	4	4	32
BEGHELLI	3	3	3	3	3	4	4	4	4	31
ARCELLI	4	4	4	5	5	4	1	1	1	29
SENSI	0	0	5	4	4	4	4	4	4	29
DEL VECCHIO	2	2	4	5	3	3	3	3	3	28
TAZARTES	7	5	5	1	2	3	3	2	0	28
CORRADI	3	3	3	3	3	3	3	3	3	27
DELLA PORTA	3	3	3	3	3	3	3	3	3	27
DORIS	2	2	3	3	3	3	3	4	4	27
DRAGO	2	3	3	1	4	4	4	5	1	27
FERRAIOLI	2	2	2	2	3	4	4	4	4	27

MARAMOTTI	3	3	3	5	3	3	3	2	2	27
RECORDATI	4	3	3	3	3	3	3	2	3	27
RAVANELLI	0	3	3	3	3	3	3	4	4	26
PEDERSOLI	1	1	1	2	2	5	5	4	4	25
RONDELLI	5	5	5	2	2	1	1	2	2	25
TARGETTI	3	3	3	3	3	2	2	3	3	25
BALDI	6	6	6	7	8	7	4	4	5	24
COFFEN	0	3	3	3	3	3	3	3	3	24
FRANCESCHETTI	3	3	3	3	2	3	3	2	2	24
FRESCO	2	2	3	4	5	2	2	2	2	24
MAFFEO	0	3	3	3	3	3	3	3	3	24
MORATTI	2	2	2	3	3	2	2	2	6	24
RIFFESER	2	2	2	2	2	3	3	3	5	24
PROFUMO	3	3	3	3	2	2	2	2	3	23

**Table 8. Yearly director flows by number of directorships 1998-2006**

The table lists the number of directors who in any given year have a certain number of boards with reference of the number of boards by the same directors the following year. For instance, in the first table out of the 1427 directors who had just one board in 1998, 1146 of them kept one board in 1999, while 231 lost that board, 42 moved to two boards, and so on. In every table the cell at the right-end side of the last line indicates the total number of directors sitting on Italian listed company boards over the nine years considered (4270). The cell at the crossing of the "0" rows and columns indicate the number out of those 4270 directors who did not sit on any board in any of the two years in the table. For instance, in the first table 2326 indicates the directors who did not sit on any board neither in 1998 nor in 1999. The cell at the end of the "0" row indicates the number of all directors who did not sit on any board in the relative year. For instance, in the first table 2674 is the sum of all directors who did not sit on any board in 1998 out of the total 4270 directors. Likewise, the cell at the end of the "0" column indicates, out of the total 4270, the number of directors who did not sit on any board in 1999. Percentages in brackets refer to the total number of onetimers.

1998-1999

	1999											
1998	1	2	3	4	5	6	7	8	9	10	0	Grand Total
1	1146 (80%)	42	8								231	1427
2	30	111	20	1							10	172
3	3	13	40	5	3	1						65
4			4	9	4						3	20
5			1	1	3	2	1					8
6				1	3	3			1			8
7							1	1				2
8							1	1		1		3
0	332	16									2326	2674
Grand Total	1511	182	73	17	13	6	3	2	1	1	2570	4270

1999-2000

	2000											
1999	1	2	3	4	5	6	7	8	9	0	Grand Total	
1	1178 (78%)	44	2								287	1511
2	30	117	19	3							13	182
3	5	20	38	6	2						2	73
4	2	1	5	6	3							17
5				4	6	2					1	13
6				1	1	3	1					6
7							3					3
8								2				2
9								1				1
10									1			1
0	320	8	1								2241	2570
Grand Total	1535	190	65	20	12	5	4	3	1	1	2544	4270

2000-2001

	2001											
2000	1	2	3	4	5	6	8	9	0	Grand Total		
1	1174 (76%)	45	5	1						310	1535	
2	44	116	19	1						10	190	
3	9	18	26	4	5	1	1			1	65	
4	2		7	6	3		1			1	20	
5		3		3	6						12	

6	1	1		2	1					5
7		1				3				4
8						1	1	1		3
9					1					1
0	329	13	3						2199	2544
<b>Grand Total</b>	<b>1559</b>	<b>197</b>	<b>60</b>	<b>17</b>	<b>16</b>	<b>5</b>	<b>3</b>	<b>1</b>	<b>2521</b>	<b>4270</b>

2001-2002

	2002									
2001	1	2	3	4	5	6	7	9	0	<b>Grand Total</b>
1	1260 (80%)	53	1						245	1559
2	44	131	11	1					10	197
3	2	17	33	6	1				1	60
4		2	2	9	3	1				17
5	1	1	2		8	3	1			16
6		1				3		1		5
8							1	2		3
9							1			1
0	262	6							2253	2521
<b>Grand Total</b>	<b>1569</b>	<b>211</b>	<b>49</b>	<b>16</b>	<b>12</b>	<b>8</b>	<b>2</b>	<b>3</b>	<b>2509</b>	<b>4270</b>

2002-2003

	2003									
2002	1	2	3	4	5	6	7	8	0	<b>Grand Total</b>
1	1138 (72%)	50	8	1					372	1569
2	52	117	20	2			1		19	211
3	3	13	19	9	2				3	49
4	1	2	3	9	1					16
5		2	2	1	7					12
6				2		5			1	8
7						1		1		2
9							2	1		3
0	330	14							2165	2509
<b>Grand Total</b>	<b>1524</b>	<b>198</b>	<b>52</b>	<b>24</b>	<b>10</b>	<b>6</b>	<b>3</b>	<b>2</b>	<b>2560</b>	<b>4270</b>

2003-2004

	2004									
2003	1	2	3	4	5	6	7	8	0	<b>Grand Total</b>
1	1214 (80%)	37	4						269	1524
2	22	146	14	2					14	198
3	5	12	25	6	1				3	52
4	1		3	17	3					24
5				2	7	1				10
6					2	4				6
7				1			1	1		3

8							2			2
0	272	10	1						2168	2451
Grand Total	1514	205	47	28	13	5	3	1	2454	4270

2004-2005

	2005									
2004	1	2	3	4	5	6	0		Grand Total	
1	1201 (79%)	78	9					226		1514
2	32	127	27	5				14		205
3	3	8	31	4				1		47
4	1	1	6	12	3	3		2		28
5			1		9	3				13
6					1	4				5
7							3			3
8					1					1
0	499	15	2					1938		2454
Grand Total	1736	229	76	21	14	13		2181		4270

2005-2006

	2006									
2005	1	2	3	4	5	6	7	0	Grand Total	
1	1360 (78%)	45	2					329		1736
2	53	139	13	1				23		229
3	7	18	36	13	1			1		76
4		1	7	11	1			1		21
5			1	6	7					14
6		2	1	2	4	3	1			13
0	349	9	3					1820		2181
Grand Total	1769	214	63	33	13	3	1	2174		4270



**Table 9. Listed companies: network components and isolates (1998-2006)**

	1	2	3	4	5	6	7	8	9	isolates	components	Total
<b>1998</b>	167	2	2	2	2					53	58	228
	0.73	0.01	0.01	0.01	0.01					0.23		
<b>1999</b>	178	5	2	2	2	2	2			53	60	246
	0.72	0.02	0.01	0.01	0.01	0.01	0.01			0.22		
<b>2000</b>	172	6	3	3	2	2	2	2		45	53	237
	0.73	0.03	0.01	0.01	0.01	0.01	0.01	0.01		0.19		
<b>2001</b>	185	2	2	2						41	45	232
	0.8	0.01	0.01	0.01						0.18		
<b>2002</b>	180	4	2	2						41	45	229
	0.79	0.02	0.01	0.01						0.18		
<b>2003</b>	170	2	2	2	2					41	46	219
	0.78	0.01	0.01	0.01	0.01	0				0.19		
<b>2004</b>	169	4	4	2						40	44	219
	0.78	0.02	0.02	0.01						0.18		
<b>2005</b>	197	2	2	2	2	2	2	2	2	44	53	257
	0.77	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.17		
<b>2006</b>	196	2	2	2	2	2	2	2		47	55	257
	0.76	0.01	0.01	0.01	0.01	0.01	0.01	0.01		0.18		

**Table 10. Density of network companies 1998-2006**

The left-hand side of the table refers to all the sampled listed companies (MTA and MTAX markets). The right-end side of the table refers to companies which made from 1998 to 2002 the MIB 30 Index, and from 2003 to 2006 the new S&P MIB 40 index.

Year	Listed companies			MIB30/S&P-MIB 40 companies		
	Density	standard deviation	Differences	Density	standard deviation	Differences
1998	0.0313	0.2554		0.3103	0.8645	
1999	0.0306	0.2508	-0.0007	0.2851	0.8771	-0.0252
2000	0.0323	0.2554	0.0017	0.2368	0.7858	-0.0483
2001	0.0311	0.2521	-0.0012	0.3218	0.8563	0.085
2002	0.0323	0.2582	0.0012	0.3128	0.8499	-0.009
2003	0.0338	0.2599	0.0015	0.2357	0.706	
2004	0.0339	0.2618	0.0001	0.2372	0.7066	0.0015
2005	0.0279	0.2365	-0.006	0.2146	0.7017	-0.0226
2006	0.0242	0.2147	-0.0037	0.1579	0.5511	-0.0567

**Table 11. Overall graph clustering coefficient 1998-2006**

The left-hand side of the table refers to all the sampled listed companies (MTA and MTAX markets). The right-end side of the table refers to companies which made from 1998 to 2002 the MIB 30 Index, and from 2003 to 2006 the new S&P MIB 40 index.

Year	Listed companies		S&P MIB companies	
	Clustering Coefficient	Differences	Clustering coefficient	Differences
1998	0.505		0.365	
1999	0.526	0.021	0.491	0.126
2000	0.476	-0.05	0.408	-0.083
2001	0.472	-0.004	0.454	0.046
2002	0.417	-0.055	0.544	0.09
2003	0.449	0.032	0.625	
2004	0.427	-0.022	0.54	-0.085
2005	0.406	-0.021	0.445	-0.095
2006	0.365	-0.041	0.445	0

**Table 12. Frequencies of geodetic distances 1998-2006: listed companies network**

	1998			1999			2000		
	count	Freq	cumul	count	freq	cumul	count	freq	cumul
1	1116	0.04	4	1280	0.041	4.1	1272	0.043	4.3
2	4494	0.162	20.2	5786	0.183	22.4	5586	0.19	23.3
3	8454	0.305	50.7	10754	0.341	56.5	10086	0.342	57.5
4	7506	0.271	77.8	8412	0.267	83.2	7690	0.261	83.6
5	4026	0.145	92.3	3858	0.122	95.4	3306	0.112	94.8
6	1620	0.058	98.1	1138	0.036	99	1090	0.037	98.5
7	438	0.016	99.7	272	0.009	99.9	334	0.011	99.6
8	76	0.003	100	36	0.001	100	86	0.003	0.999
9	0	0		0	0		10	0	0.999
10	0	0		0	0		2	0	1
average	3.571			3.395			3.383		
	2001			2002			2003		
	count	Freq	cumul	count	freq	cumul	count	freq	cumul
1	1162	0.034	3.4	1182	0.037	3.7	1164	0.041	4.1
2	5096	0.15	18.4	5204	0.161	19.8	5380	0.187	22.8
3	10232	0.301	48.5	9850	0.306	50.4	9800	0.341	56.9
4	10212	0.3	78.5	8972	0.278	78.2	7676	0.267	83.6
5	5390	0.158	94.3	4796	0.149	93.1	3512	0.122	95.8
6	1666	0.049	99.2	1766	0.055	98.6	990	0.034	99.2
7	272	0.008	100	416	0.013	99.9	192	0.007	99.9
8	16	0	100	50	0.002	100	24	0.001	100
average	3.58			3.565			3.378		
	2004			2005			2006		
	count	Freq	cumul	count	freq	cumul	count	freq	cumul
1	1172	0.041	4.1	1330	0.034	3.4	1180	0.031	3.1
2	5454	0.192	23.3	6578	0.17	20.4	5616	0.147	17.8
3	10202	0.359	59.2	14374	0.372	57.6	12864	0.336	51.4
4	7686	0.27	86.2	11232	0.291	86.7	11830	0.309	82.3
5	3014	0.106	96.8	4108	0.106	97.3	5262	0.138	96.1
6	732	0.026	99.4	866	0.022	99.5	1242	0.032	99.3
7	144	0.005	99.9	126	0.003	99.8	212	0.006	99.9
8	14	0	100	14	0	100	28	0.001	100
average	3.308			3.346			3.499		

**Table 13. Freeman degree ranking 1998-2006 (first ten positions by year): companies.**

The Freeman Degree identifies the extent of connections of a director or of a company. It is a measure of local centrality, that is the potentiality to act or communicate with a specified number of directors. A high Freeman Degree can correspond to a low or high level of centrality with respect to the entire company network.

1998		1999		2000	
ras spa - riunione adriatica di sicurtà'	58	pirelli spa	60	mediobanca spa	58
pirelli spa	53	ras spa - riunione adriatica di sicurtà'	56	ras spa - riunione adriatica di sicurtà'	55
mediobanca spa	50	mediobanca spa	52	pirelli spa	50
holding di partecipazioni industriali spa	38	holding di partecipazioni industriali spa	43	olivetti spa - ing. c. olivetti & c.	41
camfin cam finanziaria spa	32	olivetti spa - ing. c. olivetti & c.	37	gim spa - generale industrie metallurgiche	34
falck spa	31	assicurazioni generali spa	36	camfin cam finanziaria spa	32
assicurazioni generali spa	30	gim spa - generale industrie metallurgiche	35	banca commerciale italiana spa	32
unicredito italiano spa	29	banca commerciale italiana spa	34	banca intesa spa	32
gim spa - generale industrie metallurgiche	29	camfin cam finanziaria spa	33	assicurazioni generali spa	31
gruppo editoriale l'espresso spa	25	gruppo editoriale l'espresso spa	30	holding di partecipazioni industriali spa	31
italcementi spa fabbriche riunite cemento	25				
2001		2002		2003	
pirelli spa	52	pirelli spa	60	pirelli & c. spa	59
olivetti spa - ing. c. olivetti & c.	50	olivetti spa - ing. c. olivetti & c.	54	mediobanca spa	47
telecom italia spa	49	mediobanca spa	51	telecom italia spa	42
mediobanca spa	44	telecom italia spa	49	rsc mediagroup spa	35
ras spa - riunione adriatica di sicurtà'	40	ras spa - riunione adriatica di sicurtà'	37	telecom italia mobile spa	30
camfin cam finanziaria spa	32	camfin cam finanziaria spa	29	fondiarìa - sai spa	29
gim spa - generale industrie metallurgiche	30	pirelli & c. accomandita per azioni	28	ras spa - riunione adriatica di sicurtà'	25
unicredito italiano spa	30	gim spa - generale industrie metallurgiche	28	autogrill spa	23
holding di partecipazioni industriali spa	26	holding di partecipazioni industriali spa	27	milano assicurazioni spa	23
pirelli & c. accomandita per azioni	25	telecom italia mobile spa	27	unicredito italiano spa	22
		pirelli & c. real estate spa	27	gim spa - generale industrie metallurgiche	22
				cir spa - compagnie industriali riunite	22
				snia spa	22
				cofide spa - compagnia finanziaria de benedetti	22
				ipi spa	22
2004		2005		2006	
pirelli & c. spa	54	pirelli & c. spa	56	pirelli & c. spa	46
mediobanca spa	44	mediobanca spa	47	mediobanca spa	36
rsc mediagroup spa	43	rsc mediagroup spa	47	rsc mediagroup spa	33
telecom italia spa	34	telecom italia spa	32	fondiarìa - sai spa	29
ras holding spa	32	ras holding spa	31	atlantia spa	28
telecom italia mobile spa	29	fondiarìa - sai spa	30	cir spa - compagnie industriali riunite	25
fondiarìa - sai spa	25	cir spa - compagnie industriali riunite	27	telecom italia spa	23
gim spa - generale industrie metallurgiche	24	assicurazioni generali spa	26	autogrill spa	23
cir spa - compagnie industriali riunite	24	cofide spa - compagnia finanziaria de benedetti	26	cofide spa - compagnia finanziaria de benedetti	22
cofide spa - compagnia finanziaria de benedetti	24	marzotto spa - manifattura lane gaetano marzotto & figli	26	alleanza assicurazioni spa	22
				assicurazioni generali spa	22
				milano assicurazioni spa	22
				italcementi spa fabbriche riunite cemento	22

**Table 14. Betweenness ranking 1998-2006 (first ten positions by year): companies.**

Betweenness indicates the number of paths that pass through a node. In this context, a node indicates a company, and a path indicates the shortest route which relies two companies through board interlocks. Betweenness is a complementary measure with respect to the Freeman Degree because it allows to specify whether a director or a company have a central or peripheral position within the entire network.

1998		1999		2000	
ras spa - riunione adriatica di sicurta'	2030.759	holding di partecipazioni industriali spa	2451.808	mediobanca spa	1825.219
holding di partecipazioni industriali spa	1677.957	ras spa - riunione adriatica di sicurta'	1696.096	olivetti spa - ing. c. olivetti & c.	1802.526
camfin cam finanziaria spa	1483.435	olivetti spa - ing. c. olivetti & c.	1415.616	holding di partecipazioni industriali spa	1371.234
pirelli spa	1395.999	banca commerciale italiana spa	1308.372	ras spa - riunione adriatica di sicurta'	1301.471
interbanca spa	1290.043	pirelli spa	1154.36	banca commerciale italiana spa	1115.958
seat - pagine gialle spa	999.101	telecom italia spa	1047.878	impregilo spa	993.903
alleanza assicurazioni spa	964.006	interbanca spa	986.07	marzotto spa - manifattura lane gaetano marzotto & figli	882.544
snia spa	912.343	marzotto spa - manifattura lane gaetano marzotto & figli	954.442	banca agricola mantovana spa	875.813
mediobanca spa	846.899	seat - pagine gialle spa	940.705	finmeccanica spa	697.662
banca nazionale dell'agricoltura spa	805	camfin cam finanziaria spa	882.354	la fondiaria assicurazioni spa	681.561
2001		2002		2003	
mediobanca spa	2355.615	mediobanca spa	2350.234	pirelli & c. spa	1635.933
telecom italia spa	2120.525	snia spa	2135.646	snia spa	1444.443
olivetti spa - ing. c. olivetti & c.	2085.832	olivetti spa - ing. c. olivetti & c.	2129.524	telecom italia spa	1354.654
pirelli spa	2067.12	telecom italia spa	2043.115	meliorbanca spa	1293.605
la fondiaria assicurazioni spa	1482.371	autogrill spa	1267.117	rsc mediagroup spa	1229.456
meliorbanca spa	1387.732	holding di partecipazioni industriali spa	1175.203	mediobanca spa	1164.718
snia spa	1364.332	pirelli spa	1100.181	acea spa	942.389
holding di partecipazioni industriali spa	1295.58	edison spa	914.343	banca monte dei paschi di siena spa	937.792
autogrill spa	965.355	acea spa	881.888	telecom italia mobile spa	919.392
marzotto spa - manifattura lane gaetano marzotto & figli	884.339	ras spa - riunione adriatica di sicurta'	863.617	fondiaria - sai spa	881.123
2004		2005		2006	
pirelli & c. spa	1860.264	pirelli & c. spa	3167.294	pirelli & c. spa	3280.198
rsc mediagroup spa	1391.94	mediobanca spa	1524.077	mediobanca spa	1192.814
indesit company spa	1131.634	rsc mediagroup spa	1522.533	atlantia spa	1185.565
mediobanca spa	986.33	ras holding spa	1280.437	indesit company spa	1121.498
ras holding spa	932.653	alleanza assicurazioni spa	1151.503	alleanza assicurazioni spa	1049.374
telecom italia spa	843.001	atlantia spa	1029.008	fondiaria - sai spa	1028.248
banca monte dei paschi di siena spa	826.006	telecom italia spa	979.757	rsc mediagroup spa	987.167
fondiaria - sai spa	818.726	fondiaria - sai spa	884.164	sanpaolo imi spa	985.211
sorin spa	775.081	assicurazioni generali spa	752.291	fiat spa	956.376
italcementi spa fabbriche riunite cemento	740.019	marzotto spa - manifattura lane gaetano marzotto & figli	750.376	camfin cam finanziaria spa	892.5

**Table 15. Closeness (farness) ranking 1998-2006 (first ten positions by year): companies**

1998		1999		2000	
ras spa - riunione adriatica di sicurtà'	14302	holding di partecipazioni industriali spa	17131	mediobanca spa	15791
holding di partecipazioni industriali spa	14303	ras spa - riunione adriatica di sicurtà'	17140	olivetti spa - ing. c. olivetti & c.	15808
pirelli spa	14304	mediobanca spa	17140	holding di partecipazioni industriali spa	15816
camfin cam finanziaria spa	14313	pirelli spa	17141	ras spa - riunione adriatica di sicurtà'	15821
mediobanca spa	14314	banca commerciale italiana spa	17151	banca commerciale italiana spa	15821
banca commerciale italiana spa	14328	assicurazioni generali spa	17155	pirelli spa	15829
snia spa	14338	olivetti spa - ing. c. olivetti & c.	17158	assicurazioni generali spa	15830
assicurazioni generali spa	14338	telecom italia spa	17164	banca intesa spa	15831
alleanza assicurazioni spa	14338	camfin cam finanziaria spa	17165	montedison spa	15840
italcementi spa fabbriche riunite cemento	14345	marzotto spa - manifattura lane gaetano marzotto & figli	17172	telecom italia spa	15842
				alleanza assicurazioni spa	15842
2001		2002		2003	
mediobanca spa	11338	mediobanca spa	11634	pirelli & c. spa	11122
olivetti spa - ing. c. olivetti & c.	11341	olivetti spa - ing. c. olivetti & c.	11642	mediobanca spa	11125
pirelli spa	11347	telecom italia spa	11644	telecom italia mobile spa	11128
telecom italia spa	11347	pirelli spa	11656	rsc mediagroup spa	11130
holding di partecipazioni industriali spa	11353	holding di partecipazioni industriali spa	11661	telecom italia spa	11135
ras spa - riunione adriatica di sicurtà'	11368	ras spa - riunione adriatica di sicurtà'	11669	fondiaria - sai spa	11157
unicredito italiano spa	11370	telecom italia mobile spa	11671	snia spa	11161
gim spa - generale industrie metallurgiche	11375	banca antoniana popolare veneta spa	11677	autogrill spa	11162
smi spa - società metallurgica italiana	11375	snia spa	11678	ras spa - riunione adriatica di sicurtà'	11163
camfin cam finanziaria spa	11382	autogrill spa	11683	assicurazioni generali spa	11167
2004		2005		2006	
pirelli & c. spa	11319	pirelli & c. spa	15847	pirelli & c. spa	16122
rsc mediagroup spa	11332	mediobanca spa	15872	mediobanca spa	16147
mediobanca spa	11337	rsc mediagroup spa	15879	atlantia spa	16179
telecom italia mobile spa	11346	ras holding spa	15893	rsc mediagroup spa	16179
ras holding spa	11347	assicurazioni generali spa	15905	telecom italia spa	16185
telecom italia media spa	11355	telecom italia spa	15909	fondiaria - sai spa	16186
telecom italia spa	11367	atlantia spa	15914	autogrill spa	16195
italcementi spa fabbriche riunite cemento	11373	autogrill spa	15919	fiat spa	16195
fondiaria - sai spa	11375	fondiaria - sai spa	15920	alleanza assicurazioni spa	16196
unicredito italiano spa	11377	camfin cam finanziaria spa	15921	assicurazioni generali spa	16199

**Table 15. Freeman degree ranking 1998-2006 (first ten positions by year): directors.**

1998		1999		2000	
pesenti giampiero	109	tronchetti provera marco	126	tronchetti provera marco	119
falck alberto	101	erede sergio	117	marchio' angelo	110
guty gianfranco	97	guty gianfranco	107	guty gianfranco	107
erede sergio	92	falck alberto	101	erede sergio	102
marchio' angelo	86	marchio' angelo	94	lucchini luigi	100
tronchetti provera marco	84	pecci alberto	90	falck alberto	96
gazzoni frascara giuseppe	73	pesenti giampiero	86	grande stevens franzo	84
lucchini luigi	73	grande stevens franzo	84	pesenti giampiero	83
sozzani vincenzo	71	de benedetti carlo	82	de benedetti carlo	81
orlando luigi	69	lucchini luigi	82	rondelli lucio	80
rondelli lucio	69				
pecci alberto	69				
2001		2002		2003	
tronchetti provera marco	135	buora carlo	126	buora carlo	113
guty gianfranco	102	benetton gilberto	123	benetton gilberto	112
benetton gilberto	94	mion gianni	110	pesenti carlo	98
mion gianni	92	greco mario	97	greco mario	96
grande stevens franzo	91	pesenti carlo	95	ligresti gioacchino paolo	95
falck alberto	82	falck alberto	83	mion gianni	89
maramotti achille	79	puri negri carlo alessandro	83	grande stevens franzo	87
buora carlo	76	ripa di meana vittorio	82	ligresti jonella	84
fabrizi pier luigi	75	pesenti giampiero	77	puri negri carlo alessandro	84
pesenti giampiero	75	tronchetti provera marco	76	ligresti giulia maria	79
2004		2005		2006	
buora carlo	116	buora carlo	105	pesenti carlo	105
benetton gilberto	104	ligresti jonella	102	benetton gilberto	90
mion gianni	102	pesenti carlo	101	ligresti jonella	84
pesenti carlo	101	benetton gilberto	90	galateri di genola e suniglia gabriele	80
ligresti jonella	100	galateri di genola e suniglia gabriele	90	ligresti giulia maria	77
pesenti giampiero	84	puri negri carlo alessandro	84	perissinotto giovanni	74
perissinotto giovanni	84	perissinotto giovanni	83	pini massimo	73
de benedetti carlo	82	de benedetti carlo	79	bernheim antoine	66
puri negri carlo alessandro	82	ligresti giulia maria	77	mion gianni	66
greco mario	79	pesenti giampiero	72	erede sergio	65
				acutis carlo	65
				ligresti gioacchino paolo	65

**Table 16. Betweenness ranking 1998-2006 (first ten positions by year): directors.**

Betweenness indicates the number of paths that pass through a node. In this context, a node indicates a company, and a path indicates the shortest route which relies two companies through board interlocks. Betweenness is a complementary measure with respect to the Freeman Degree because it allows to specify whether a director or a company have a central or peripheral position within the entire network.

1998		1999		2000	
erede sergio	93993.7	erede sergio	149080.844	erede sergio	133784.2
rocca gianfelice	83777.39	sabatini paolo	62273.074	colaninno roberto	63700.89
guty gianfranco	64041.82	guty gianfranco	61545.5	lucchini luigi	53355.86
pesenti giampiero	48589.09	nefri nicolo'	56180.273	ciani carlo	48889.73
zanetti emilio	48430.3	lucchini luigi	49119.219	savona paolo	48426.52
puri negri carlo alessandro	47562.43	tronchetti provera marco	46847.922	martini giandomenico	45381.76
falck alberto	45541.22	bondi enrico	46670.504	benetton alessandro	44313.18
philippe jaques emile georges	43673.75	pesenti giampiero	42853.523	grande stevens franzo	42226.88
scotti luigi	40953	ciani carlo	40795.27	pesenti carlo	41634.43
marzotto pietro	40458.36	puri negri carlo alessandro	40660.262	nefri nicolo'	40800.44
2001		2002		2003	
tronchetti provera marco	104042.6	benetton gilberto	140041.844	ligresti giacchino paolo	96292
fabrizi pier luigi	80176.91	fabrizi pier luigi	120045.992	grande stevens franzo	81597.98
colombo umberto	75630.25	colombo umberto	109354.102	colombo umberto	78151.69
ciani carlo	69549.06	buora carlo	96253.141	vitale marco	72945.02
erede sergio	68017.09	vitale marco	83896.25	benetton gilberto	71297.66
mion gianni	63983.19	erede sergio	83417.453	caltagirone francesco gaetano	67237.89
doris ennio	63929.04	pesenti carlo	71619.156	buora carlo	59352.57
grande stevens franzo	62036.42	mion gianni	70764.25	molinari amato luigi	52416.11
callieri carlo	60560.67	ripa di meana vittorio	66140.508	mion gianni	48460.98
vitale marco	60272.25	doris ennio	60541.945	greco mario	44593.6
2004		2005		2006	
grande stevens franzo	66750.5	benetton gilberto	68241.828	giarda dino piero	88647.31
benetton gilberto	61795.77	della valle diego	61266.453	erede sergio	84861.02
greco mario	59666.06	rocca gianfelice	59166.613	perissinotto giovanni	78911.78
mion gianni	56663.8	giarda dino piero	58954.586	ligresti giulia maria	73635.03
pesenti carlo	52904.91	pesenti carlo	57786.688	gros pietro gian maria	70473.06
clo' alberto	52258.23	ligresti jonella	57655.289	acutis carlo	69772.48
ligresti jonella	50945.4	pesenti giampiero	56314.344	greco mario	65073.34
molinari amato luigi	50696.54	ligresti giulia maria	56254.73	benetton gilberto	64987.32
rocca gianfelice	46235.07	perissinotto giovanni	54613.691	rocca gianfelice	59031.6
ligresti giulia maria	43003.77	erede sergio	54373.855	ciampicali pier antonio	58392



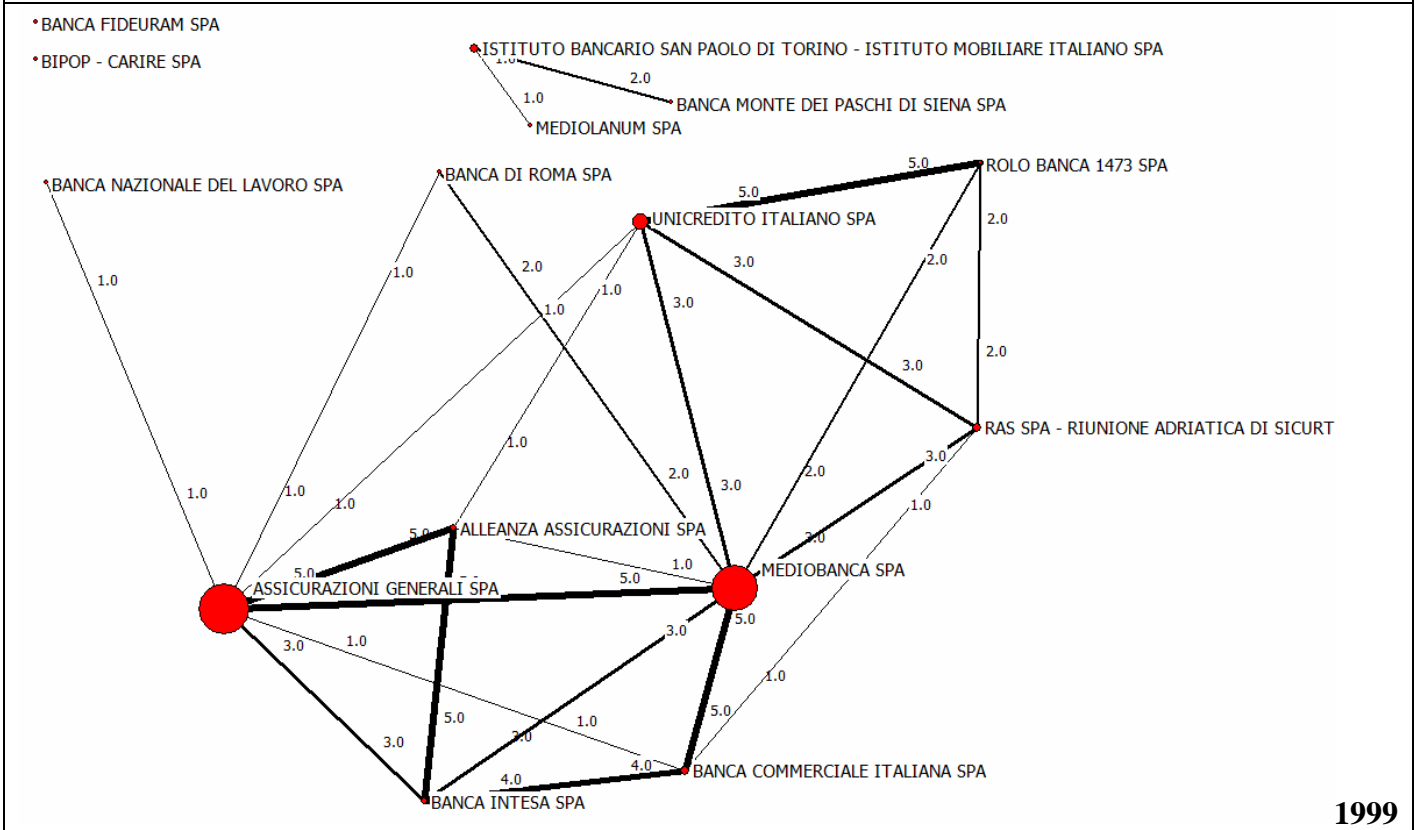
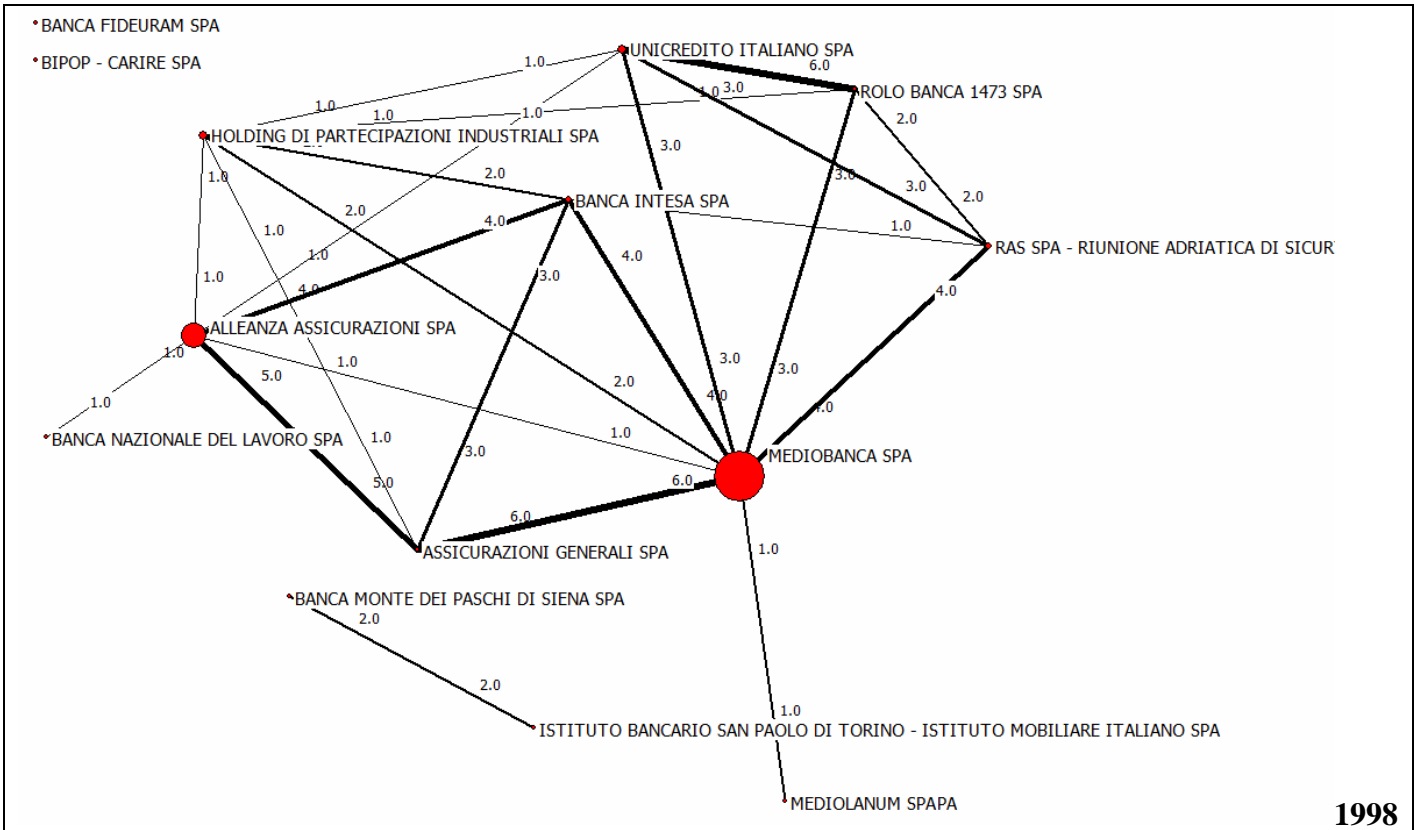
**Table 15. Closeness (farness) ranking 1998-2006 (first ten positions by year): directors**

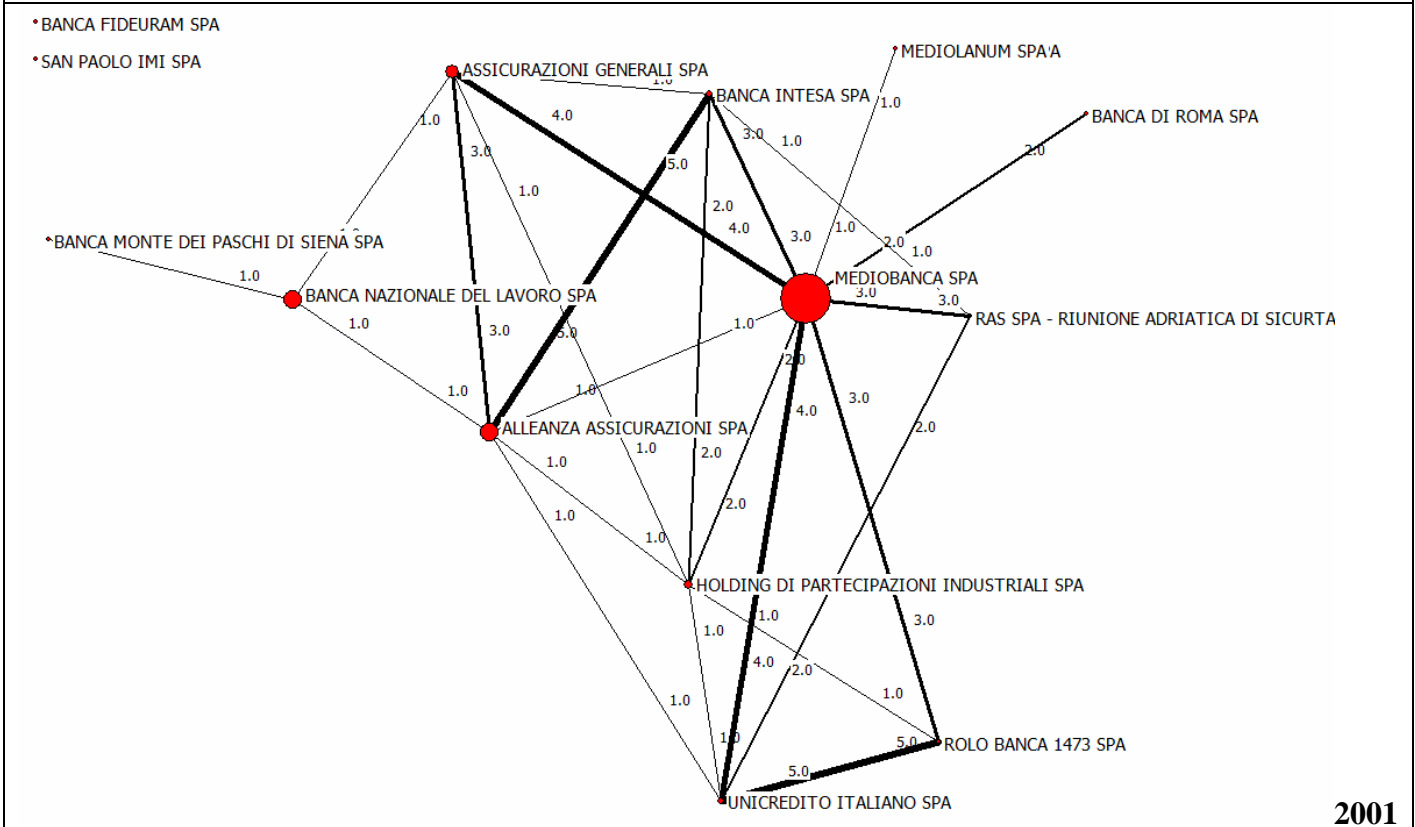
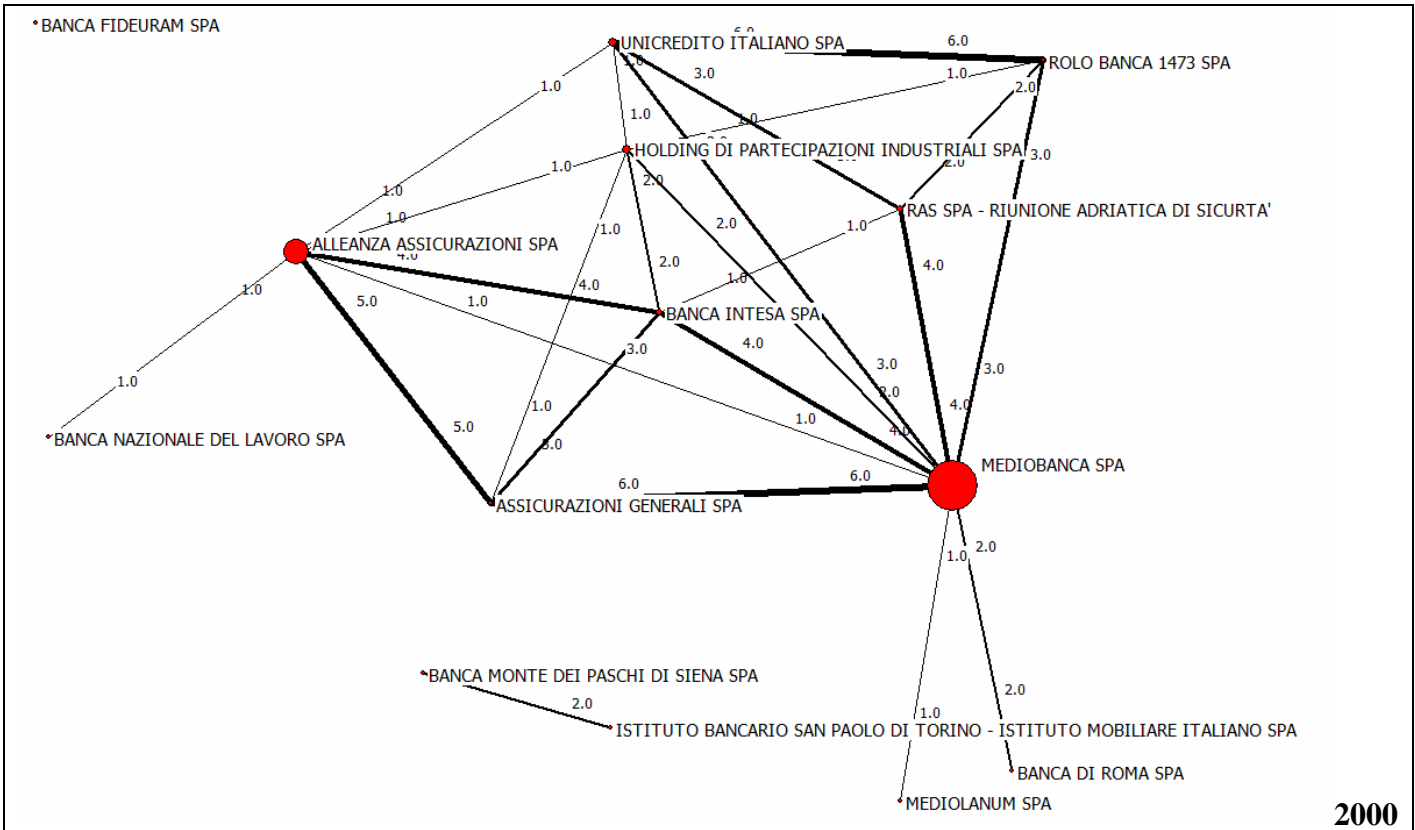
1998		1999		2000	
PESENTI GIAMPIERO	736748	TRONCHETTI PROVERA MARCO	828626	LUCCHINI LUIGI	868069
TRONCHETTI PROVERA MARCO	736778	EREDE SERGIO	828670	COLANINNO ROBERTO	868107
FALCK ALBERTO	736850	GUTTY GIANFRANCO	828697	MARCHIO' ANGELO	868132
GUTTY GIANFRANCO	736860	LUCCHINI LUIGI	828719	TRONCHETTI PROVERA MARCO	868145
GAZZONI FRASCARA GIUSEPPE	736865	PESENTI GIAMPIERO	828727	GUTTY GIANFRANCO	868158
SOZZANI VINCENZO	736873	BONDI ENRICO	828756	GERONZI CESARE	868195
MARCHIO' ANGELO	736873	MARCHIO' ANGELO	828796	PECCI ALBERTO	868223
ORLANDO LUIGI	736902	GERONZI CESARE	828864	PESENTI CARLO	868235
MARZOTTO PIETRO	736980	RONDELLI LUCIO	828887	RONDELLI LUCIO	868238
RONDELLI LUCIO	736994	PECCI ALBERTO	828891	EREDE SERGIO	868239
2001		2002		2003	
TRONCHETTI PROVERA MARCO	624701	BENETTON GILBERTO	667897	BUORA CARLO	682306
BUORA CARLO	624861	BUORA CARLO	667930	BENETTON GILBERTO	682504
MARAMOTTI ACHILLE	624954	MION GIANNI	668185	MION GIANNI	682534
PIRELLI ALBERTO	624978	GRECO MARIO	668261	GRECO MARIO	682555
PECCI ALBERTO	625015	PESENTI CARLO	668272	LIGRESTI GIOACCHINO PAOLO	682632
PURI NEGRI CARLO ALESSANDRO	625046	GERONZI CESARE	668333	LIGRESTI GIULIA MARIA	682647
GUTTY GIANFRANCO	625065	PURI NEGRI CARLO ALESSANDRO	668336	LUCCHINI GIUSEPPE	682662
MION GIANNI	625069	TRONCHETTI PROVERA MARCO	668343	LIGRESTI JONELLA	682678
GERONZI CESARE	625091	CIRLA GIORGIO	668390	PURI NEGRI CARLO ALESSANDRO	682692
BENETTON GILBERTO	625100	FRESCO PAOLO	668404	GRANDE STEVENS FRANZO	682693
2004		2005		2006	
BUORA CARLO	712064	BENETTON GILBERTO	934004	BENETTON GILBERTO	931106
GRECO MARIO	712112	BUORA CARLO	934051	PERISSINOTTO GIOVANNI	931139
PESENTI CARLO	712121	GALATERI DI GENOLA E SUNIGLIA GABRIELE	934139	LIGRESTI GIULIA MARIA	931226
BENETTON GILBERTO	712171	PERISSINOTTO GIOVANNI	934194	GALATERI DI GENOLA E SUNIGLIA GABRIELE	931292
LIGRESTI JONELLA	712172	PESENTI GIAMPIERO	934201	BOMBASSEI ALBERTO	931328
MION GIANNI	712196	PESENTI CARLO	934247	ACUTIS CARLO	931350
PESENTI GIAMPIERO	712222	BERNHEIM ANTOINE	934268	LIBONATI BERARDINO	931357
PERISSINOTTO GIOVANNI	712242	VAGNONE PAOLO	934303	PESENTI CARLO	931361
LIGRESTI GIULIA MARIA	712263	PURI NEGRI CARLO ALESSANDRO	934319	PIRELLI ALBERTO	931369
GALATERI DI GENOLA E SUNIGLIA GABRIELE	712284	LIGRESTI JONELLA	934322	PURI NEGRI CARLO ALESSANDRO	931393

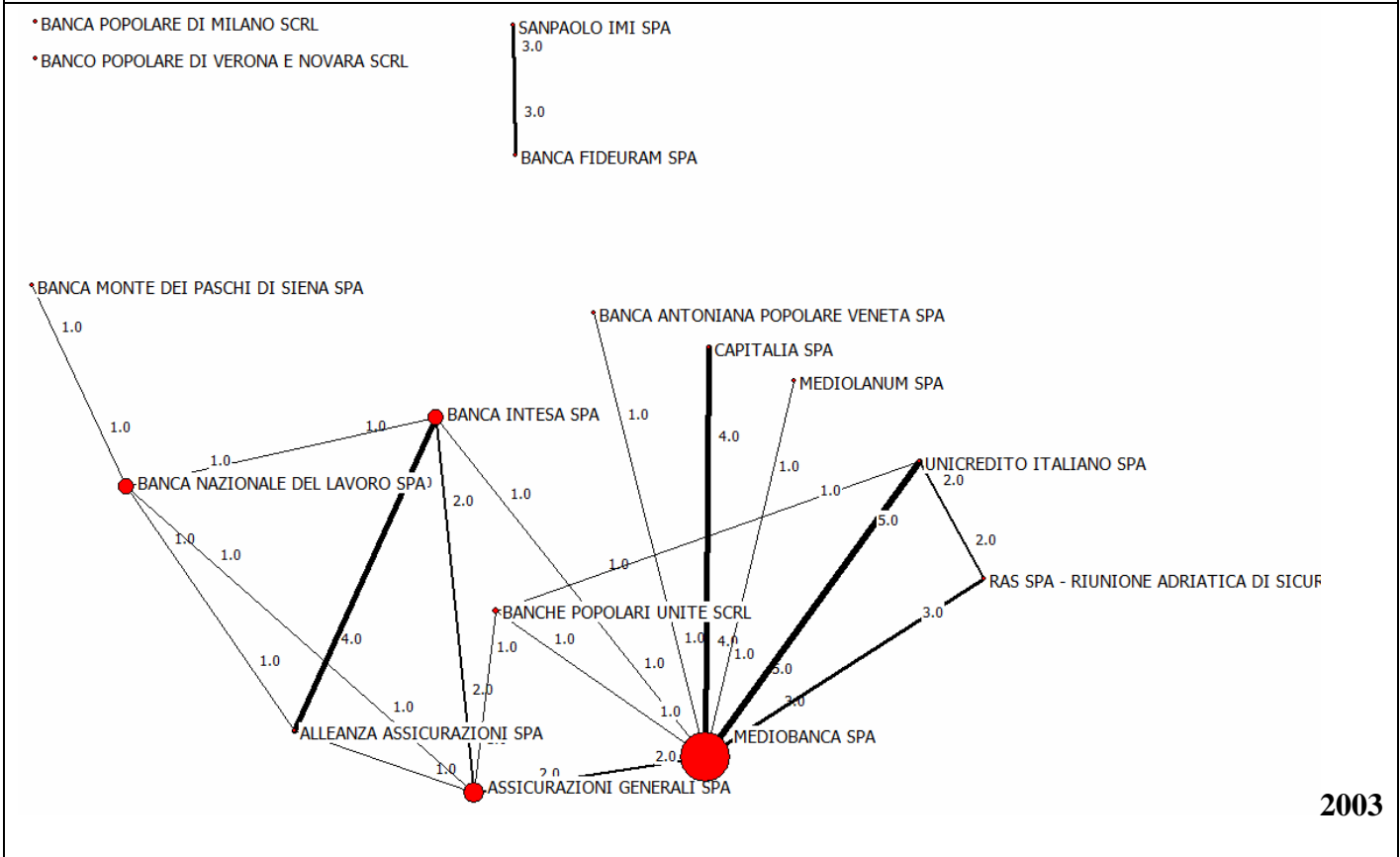
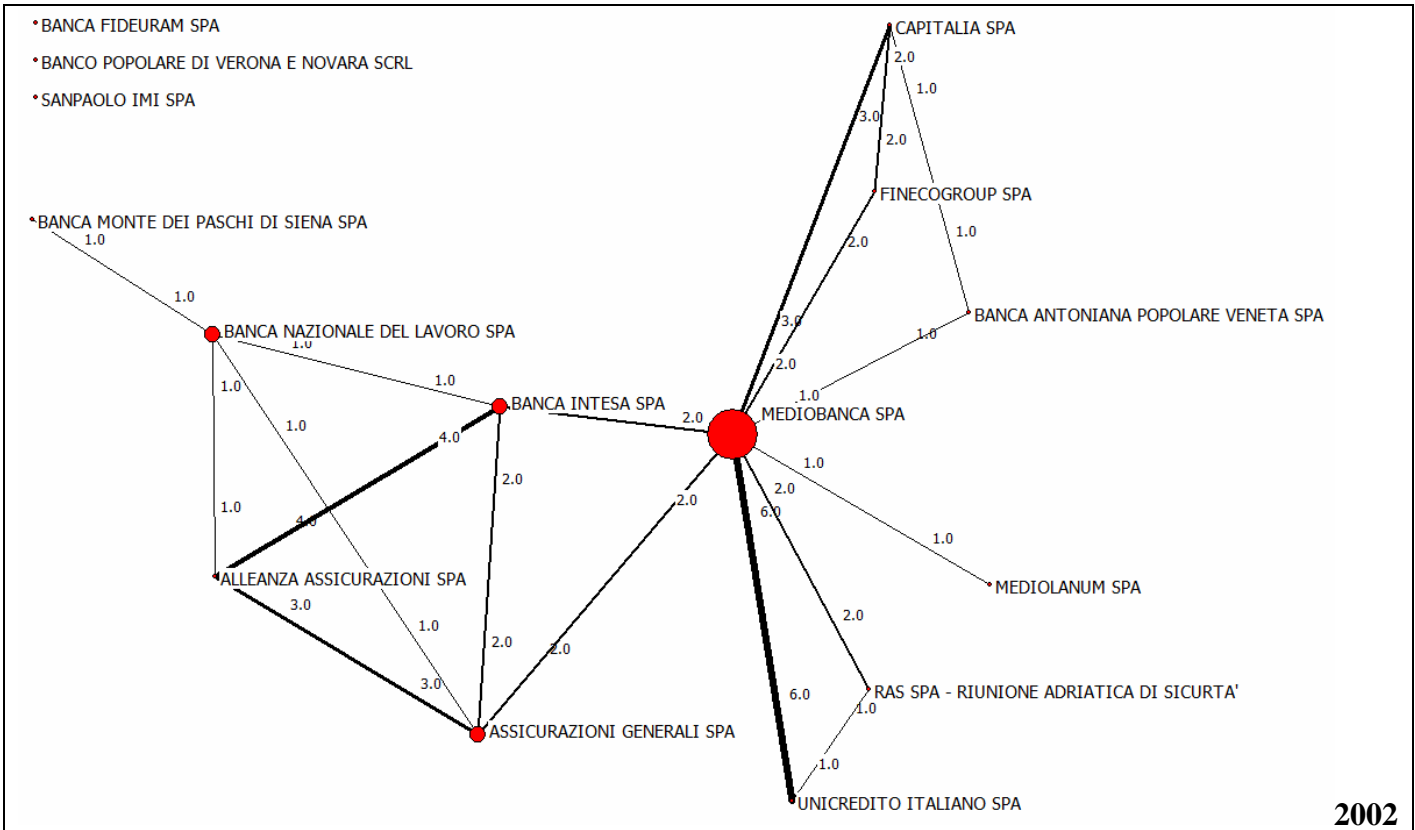
**Table 17. Network centralization index 1998-2006 (betweenness)**

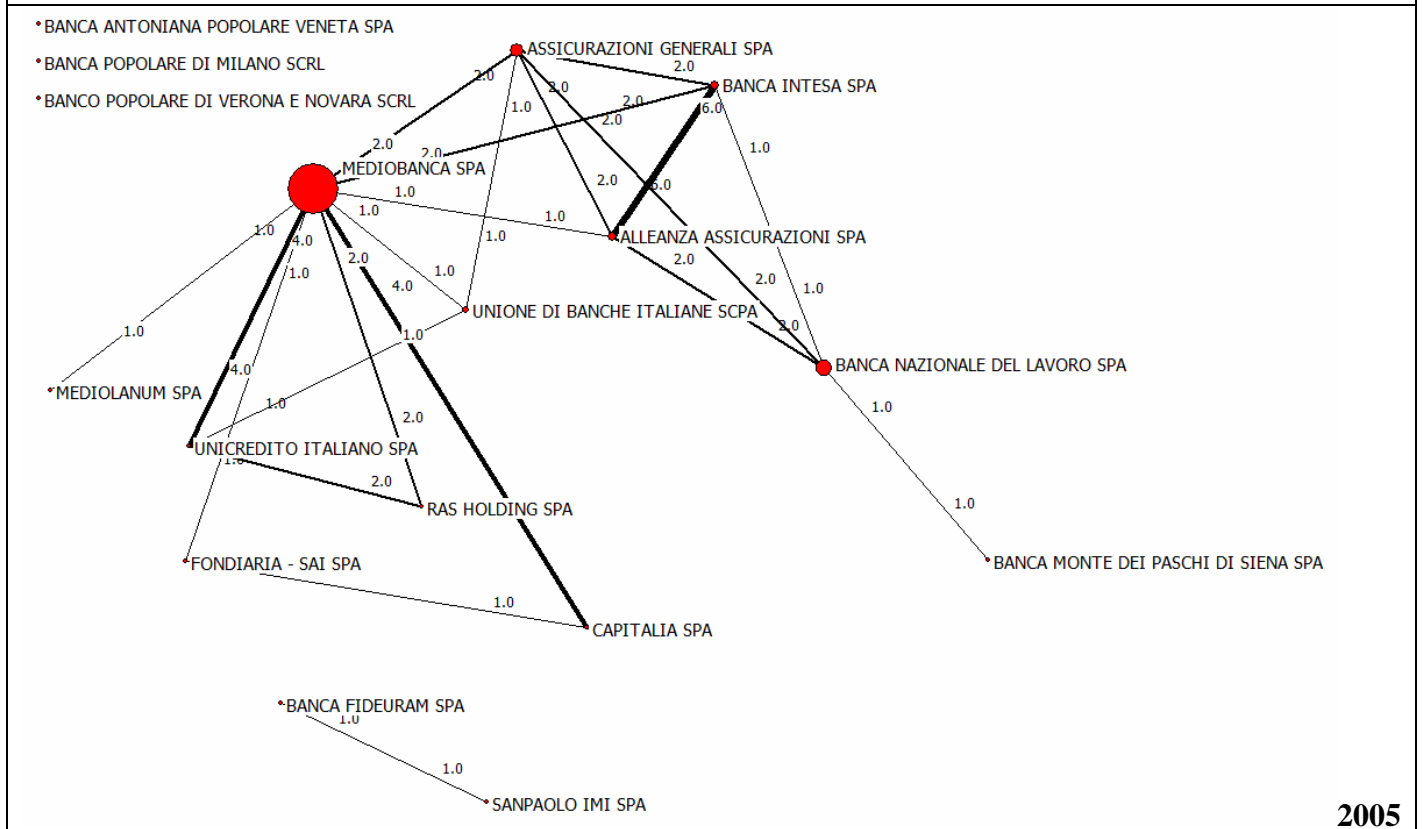
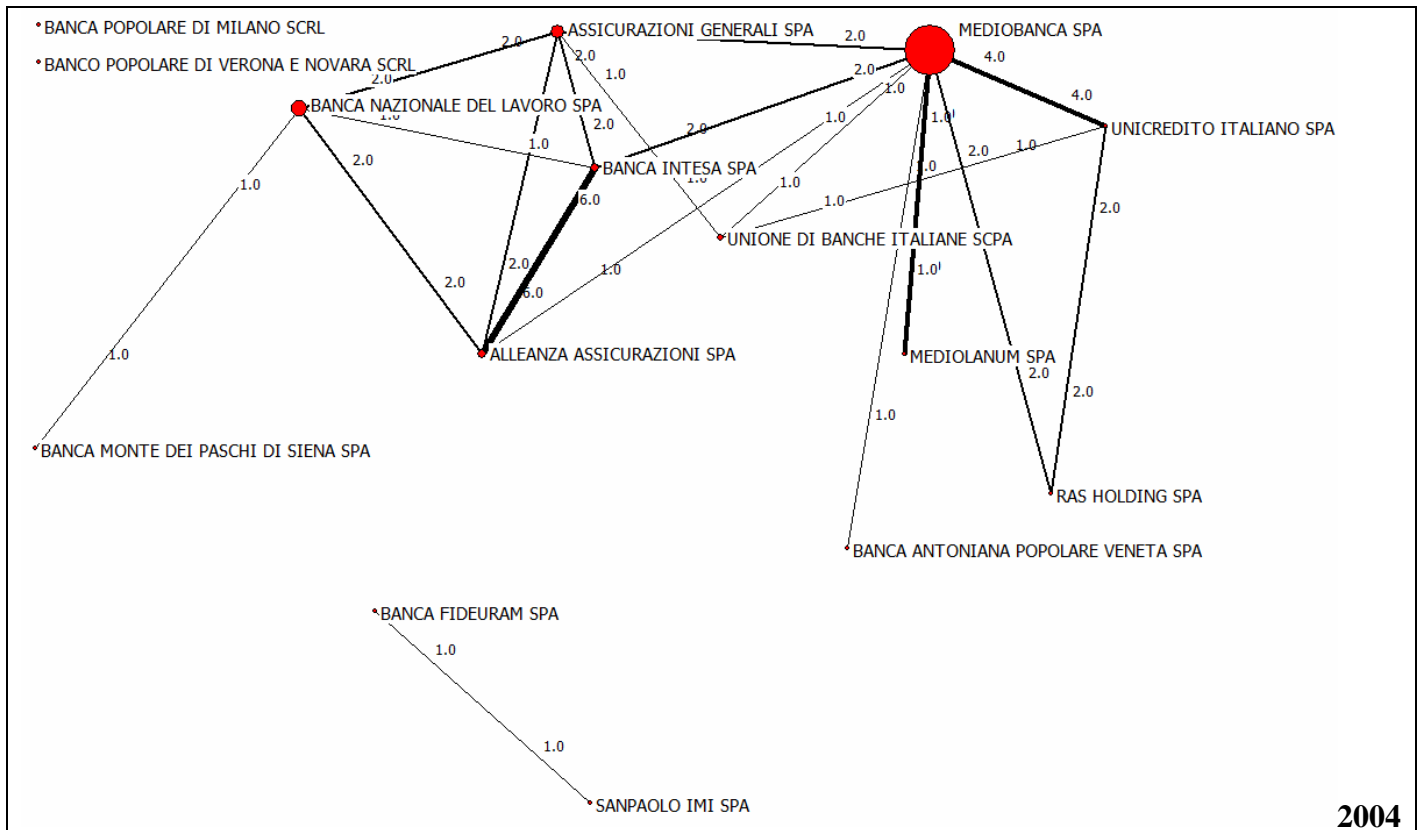
<b>Year</b>	<b>listed companies</b>	<b>Differences</b>	<b>S&amp;P MIB companies</b>	<b>Differences</b>
1998	7.34		12.47	
1999	7.72	0.38	23.77	11.3
2000	6.07	-1.65	19.65	-4.12
2001	8.19	2.12	19.45	-0.2
2002	8.42	0.23	27.72	8.27
2003	6.29	-2.13	16.29	
2004	7.26	0.97	13.68	-2.61
2005	9.2	1.94	16.3	2.62
2006	9.52	0.32	15.6	-0.7

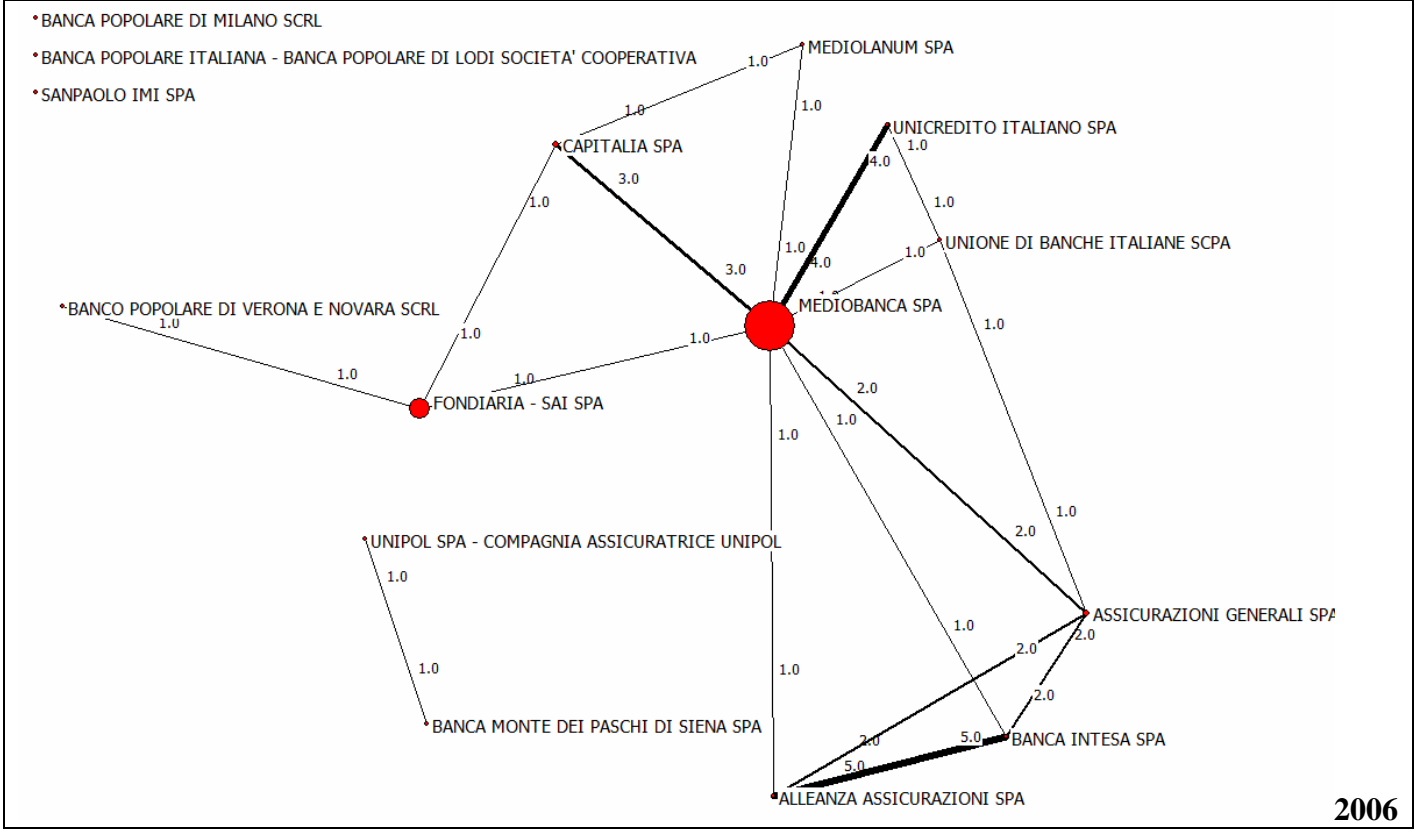
**Table 18. Link persistency over the time (MIB 30/S&P-MIB financial companies 1998-2006)**











## Appendix 1.

### Listed companies according to board size 1998-2006

societa	1998	1999	2000	2001	2002	2003	2004	2005	2006	Total
a.m.g.a. spa - azienda mediterranea gas e acqua		7								7
ac.e.ga.s. spa				9	9					18
acea spa		6	9	9	8	9	9	9	9	68
acegas - aps spa						13	13	13	13	52
acotel group spa								7	7	14
acqua pia antica marcia spa	6	6	7	7	6	7	7	7		53
acque potabili spa - societa' per condotta di acque potabili	7	7	7	7	7	7	7	8	8	65
acquedotto de ferrari galliera spa	10	10	10	10	10	6	7	5		68
acquedotto nicolay spa	7	7	7	5	5	5				36
acsm como spa		7	9							16
acsm spa				10	10	10	10	10	10	60
actelios spa					8	9	9	10	10	46
aedes spa							12	12	14	38
aedes spa - ligure lombarda per imprese e costruzioni	5	12	12	12	12	12				65
aem spa	7	8	8	8	8	8	8	9	9	73
aeroporti di roma spa	9	9	9							27
aeroporto di firenze - adf spa			14	17	17	17	17	17	17	116
aeroporto di venezia marco polo spa - save								11	13	24
air dolomiti spa - linee aeree regionali europee				9	9					18
alerion industries spa					13	14	15	15	15	72
algot spa in liquidazione								2		2
alitalia linee aeree italiane spa	16	17	16	17	17	11	5	5	4	108
alleanza assicurazioni spa	13	13	13	14	14	13	14	14	14	122
allianz subalpina spa	11	11	11							33
amga spa - azienda mediterranea gas e acqua	7		7	7	7	7	7	7		49
amplifon spa				7	7	7	7	7	7	42
anima sgr spa								9	9	18
ansaldo sts spa									9	9
ansaldo trasporti spa	7	7	5							19
arena agroindustrie alimentari spa							8	4	4	16
arnoldo mondadori editore spa	9	10	10	11	9	12	12	12	11	96
arquati spa	5	5	5	5	5					25
arquati spa in amministrazione straordinaria							1			1
arquati spa in liquidazione						4				4
as roma spa			12	12	12	12	12	11	11	82
ascopiave spa									5	5
asm brescia spa					5	7	7	7	8	34
assicurazioni generali spa	19	20	20	20	20	20	19	18	17	173
assitalia spa - assicurazioni d'italia	5	5								10
astaldi spa					15	15	13	13	13	69
atlantia spa							15	14	15	44
autogrill spa	9	9	8	8	9	11	11	11	11	87
autostrada torino milano spa	11	11	12	13	13	13	13	13	12	111
autostrade meridionali spa	5	5								10
autostrade spa						15				15
autostrade spa - concessioni e costruzioni autostrade	7	7	15	15	15					59
azienda energetica metropolitana torino			5	7	7	7				26



azimut holding spa							10	10	10	30
banca agricola mantovana spa	15	15	14	15	15					74
banca antoniana popolare veneta spa					15	15	15	15		60
banca carige spa - cassa di risparmio di genova e imperia	15	18	18	18	18	18	18	18	18	159
banca commerciale italiana spa	14	17	16							47
banca di legnano spa	14	14	14							42
banca di roma spa	11	15	15	15						56
banca fideuram spa	9	8	7	7	7	9	9	9	9	74
banca finnat euramerica spa						11	11	11	11	44
banca generali spa									10	10
banca ifis spa						6	6	8	8	28
banca intermobiliare di investimenti e gestioni spa	8	9	9	9	9	9	12	12	10	87
banca intesa spa	15	21	25	25	25	23	23	22	19	198
banca italease spa								17	16	33
banca lombarda	17	19								36
banca lombarda e piemontese spa			21	21	21	21	21	21	20	146
banca monte dei paschi di siena spa	9	9	11	11	11	16	16	15	10	108
banca nazionale del lavoro spa	13	12	13	13	13	13	13	14		104
banca nazionale dell'agricoltura spa	11	10								21
banca piccolo credito valtellinese scarl	12	12	12	12	12	12				72
banca piccolo credito valtellinese societa' cooperativa							14	14	15	43
banca popolare commercio e industria scril	14	15	15	14	15					73
banca popolare dell'etruria e del lazio scarl	16	16	17	17	16	18	18	15	15	148
banca popolare di bergamo-credito varesino scril	21	21	21	20	21					104
banca popolare di cremona scril	14	14	15	15	15					73
banca popolare di cremona spa						15				15
banca popolare di intra scril	13	13	13	13	13	13				78
banca popolare di intra spa							12	13	13	38
banca popolare di lodi scril	14	16	16	16	17	17				96
banca popolare di milano scril	15	18	20	18	18	20	20	19	20	168
banca popolare di novara scril	20	19	15	14						68
banca popolare di spoletto spa	13	13	13	13	13	13	15	15	15	123
banca popolare di verona - banco s. geminiano e s. prospero	18	18	18	18						72
banca popolare italiana - banca popolare di lodi societa' cooperativa							17	16	16	49
banca profilo spa		10	10	10	9	10	10	10	10	79
banca san paolo di brescia spa	14									14
banca toscana spa	10	10	9	10	10					49
banche popolari unite scril						21				21
banco di chiavari e della riviera ligure spa	11	11	11	11	10					54
banco di desio e della brianza spa	10	9	9	9	10	10	9	9	8	83
banco di napoli spa	10	10	7	7						34
banco di sardegna spa	14	14	14	15	14	15	15	15	15	131
banco popolare di verona e novara scril					20	20	20	20	20	100
basic net spa		12	10	8	8	8	5	5	5	61
bassetti spa	4	4	4							12
bastogi spa	5	5	5	5	5	7	7	7	6	52
bayerische vita spa	4	5	5	7	7					28
beghelli spa	6	6	9	8	8	9	9	9	9	73
benetton group spa	9	11	11	11	11	11	11	11	11	97
beni stabili spa		8	8	11	11	11	7	7	7	70
biesse spa				5	5	5	5	6	7	33
bipielle investimenti spa					17	16	17	12		62

bipop - carire spa	15	19	19	20						73
boero bartolomeo spa	8	8	9	9	10	10	10	10	9	83
bolzoni spa									10	10
bonaparte spa	5	5	7	7						24
bonifica terreni ferraresi e imprese agricole spa	8	8	8	9	9	9	9	9	9	78
borgosesia spa	4	4								8
brembo spa - freni Brembo	7	7	9	9	12	11	11	11	11	88
brioschi finanziaria spa	5	10	10	10	10	8	8	7	7	75
bulgari spa	7	7	6	7	7	7	7	7	7	62
buongiorno spa								1	1	2
buzzi unicec spa		8	10	9	11	11	12	13	13	87
cad it spa								8	8	16
caffaro spa	9	8								17
cairo communication spa								8	7	15
calcestruzzo spa - societa' per il calcestruzzo ed il cemento spa	6	5								11
calp spa - cristalleria artistica la piana	8	8	8	8	8					40
caltagirone editore spa			7	9	9	9	9	9	9	61
caltagirone spa	7	7	7	9	9	9	9	9	9	75
camfin cam finanziaria spa	13	12	12	14	14	13	15	15	15	123
capitalia spa					15	19	19	20	20	93
carraro spa	9	9	9	9	9	9	8	9	9	80
cartiere burgo spa	8	11								19
cassa di risparmio di firenze			15							15
cassa di risparmio di firenze spa				15	15	14				44
cassa di risparmio di firenze spa - banca cr firenze							14	14	14	42
castelgarden spa	9	9								18
cdc point spa								7	7	14
cembre spa	7	6	7	9	9	8	8	8	8	70
cementeria di augusta spa	7	7								14
cementeria di barletta spa	7	7	7							21
cementir spa - cementerie del tirreno	9	9	11	11	11	10	10	10	12	93
centenari e zinelli spa	5	4	4	3	5	5				26
centrale del latte di torino & c. spa			9	9	9	9	9	9	9	63
chl - centro hl distribuzione spa								6	6	12
ciccolella spa							5	5	3	13
ciga spa	10	10								20
cir spa - compagnie industriali riunite	11	12	11	11	11	11	13	13	13	106
cirio finanziaria spa	15			9	8					32
cirio finanziaria spa in amministrazione straordinaria						10				10
cirio spa		13	8							21
class editori spa	11	11	11	11	11	11	12	12	12	102
cmi spa	8	7	7	7						29
coats cucirini spa	7	5	5	5	5	7				34
cobra automotive technologies spa									8	8
cofide spa - compagnia finanziaria de benedetti	12	12	12	12	12	11	13	13	13	110
comau spa	9	7								16
compart spa - compagnia di partecipazioni assicurative ed industriali spa	8	8								16
credito artigiano spa		9	11	9	9	9	9	9	9	74
credito bergamasco spa	15	16	17	17	17	17	16	17	16	148
credito emiliano spa	14	14	15	14	14	13	12	12	13	121
credito fondiario e industriale spa	7	7	7							21
cremonini spa	8	8	8	8	9	8	8	8	8	73

csp - international industrie calze spa	5	4	6	7	7	7				36
csp international fashion group spa							8	8	7	23
dada spa								13	13	26
dalmine spa	9	9	9	9	9					45
danieli spa - officine meccaniche danieli & c.	9	10	10	10	10	10	10	10	9	88
data service spa								10	7	17
datalogic spa								11	13	24
datamat spa								9	8	17
davide campari - milano spa				14	14	14	11	11	10	74
de longhi spa				7	7	7	9	9	9	48
dea capital spa								9	8	17
deroma holding spa	5	4								9
digital bros spa								8	8	16
dmail group spa								7	7	14
dmt digital multimedia technologies spa							11	11	11	33
ducati motor holding spa		11	11	11	10	11	11	11	9	85
edison spa	7	8	8	7	12	12	12	12	12	90
eems italia spa									5	5
el.en. spa								9	8	17
elica spa									7	7
elios holding spa	3	4								7
emak spa	8	8	8	9	9	9	13	13	13	90
enel spa	5	7	6	7	7	7	7	9	9	64
enertad spa					7	7	7	7	9	37
engineering - ingegneria informatica - spa								9		9
eni spa	9	9	9	9	8	8	8	9	9	78
erg spa	9	9	9	10	10	11	11	11	13	93
ergo previdenza spa						5	7	7	7	26
ericsson spa	11	10	10	9	9	7	7			63
esaote spa	7	7	7	7	7					35
esprinet spa								8	9	17
eurofly spa								5	9	14
eurotech spa								9	9	18
eutelia spa								13	13	26
exprivia spa								7	7	14
falck spa	11	11	11							33
fastweb spa								6	7	13
ferretti spa			9	9	9					27
ferrovie nord milano spa	5	5								10
fiar spa - fabbrica italiana apparecchiature radioelettriche	5	5								10
fiat spa	10	11	11	13	12	11	11	15	15	109
fidia spa								5	5	10
fiera milano spa					9	9	9	9	9	45
filatura di pollone spa		5	5	7	7	7	7	7	7	52
fin.part spa	7	7	6	6	7	11				44
fin.part spa in fallimento							5	5		10
finarte - semenzato casa d'aste spa					9	5				14
finarte casa d'aste spa	7	7	7	7			7	6	7	48
fincasa 44 spa	13	13	13	13						52
fineco spa							17	15		32
finecogroup spa					21	20				41
finmatica spa		3								3

finmeccanica spa	12	12	15	15	13	14	13	12	12	118
finrex spa	3	3								6
fmr - art'e' spa - societa' internazionale di arte e cultura								7	9	16
fondiaria - sai spa					15	19	19	19	19	91
fullsix spa								12	9	21
gabetti holding spa	3	3	7	7	7	8				35
gabetti property solutions spa							8	10	9	27
garboli spa							7	7	5	19
garboli-conicos spa impresa generale di costruzioni	5	5	5	7	7	7				36
gas plus spa									7	7
gefran spa	3	3	5	5	5	5	7	7	7	47
gemina spa - generale mobiliare interessenze azionarie	5	5	5	7	7	7	9	7	9	61
geox spa							9	9	9	27
gewiss spa	5	8	8	9	9	9	9	9	9	75
giacomelli sport group spa				5	5					10
giacomelli sport group spa in amministrazione straordinaria						5				5
gildemeister italiana spa	6	6	6	6						24
gim spa - generale industrie metallurgiche	10	10	10	10	10	10	13	14	14	101
giovanni crespi spa	7	7	7	7	7	7	7	7	7	63
grandi navi veloci spa		6	6	7	7	7	9			42
granitifiandre spa				10	10	10	10	9	9	58
gruppo buffetti spa	4	6	7							17
gruppo ceramiche ricchetti spa	7	9	7	7	5	5	5	5	5	55
gruppo coin spa		8	7	7	8	6	6	9	9	60
gruppo editoriale l'espresso spa	16	15	16	17	17	17	18	18	9	143
guala closures spa								9	9	18
hera spa						13				13
hera spa (holding energia risorse ambiente)							13	17	18	48
holding di partecipazioni industriali spa	14	14	15	15	14					72
i grandi viaggi spa	9	9	8	9	9	9	9	9	9	80
i viaggi del ventaglio spa				9	9	9	10	10	5	52
i.m.a. industria macchine automatiche spa	9	9	10	10	10	10	12	12	10	92
i.net spa								9	10	19
idra presse spa	6	7	8	5						26
ifi spa - istituto finanziario industriale	10	10	10	10	10	9	9	9	13	90
ifil - finanziaria di partecipazioni spa	16			14	14	14				58
ifil investments spa							13	12	12	37
ifil spa - finanziaria di partecipazioni		14	14							28
igd immobiliare grande distribuzione spa								15	15	30
immobiliare lombarda spa		3	5	5	4	5	5	19	19	65
immobiliare metanopoli spa	7	7	7							21
immsi spa			4	5	5	9	9	9	9	50
impregilo spa	13	14	13	14	9	9	9	15	15	111
ina - istituto nazionale delle assicurazioni spa	18	14	9							41
indesit company spa							13	13	13	39
intek spa	7	7	7	6	7	7	7	7	7	62
interbanca spa	11	11	12	13	12					59
interpump group spa	6	7	7	7	7	7	7	11	11	70
investimenti & sviluppo spa							5	3	7	15
investimenti immobiliari lombardi spa		5	5	9						19
ipi spa	8			10	10	11	9	7	6	61
ipi spa - attivita' di investimento e promozione immobiliare		8	8							16

irce spa – industria romagnola conduttori elettrici	5	5	5	5	5	5	7	6	6	49
iride spa							7	7	12	26
isagro spa						13	10	10	11	44
istituto bancario san paolo di torino - istituto mobiliare italiano spa	17	17	17							51
it holding spa	6	6	6	6	6	6	6	6	6	54
italcementi spa fabbriche riunite cemento	15	15	16	16	16	15	18	18	18	147
italdesign-giugiaro spa		7	7	7	7					28
italfondiario spa - istituto italiano di credito fondiario	14	7	8							29
italgas spa - societa' italiana per il gas	14	14	15	14	15					72
italjolly spa - compagnia italiana dei jolly hotels	11	11	10	10	10	11	10	11	11	95
italmobiliare spa	7	7	7	7	9	9	10	10	10	76
itway spa								5	7	12
juventus football club spa				7	9	9	9	11	9	54
kaitech spa								5	5	10
kme group spa							8	10	9	27
la doria spa	5	5	5	5	6	7	7	7	9	56
la fondiaria assicurazioni spa	11	11	11	12						45
la gaiana spa	4	4	4	4	4	4	4	4	4	36
la rinascite spa	10	10	10	10	10					50
lavorwash spa			5	5	5	5	5	5	5	35
linificio e canapificio nazionale spa	8	7	8	8	9	9	9	9	9	76
locat spa	11	11	10	15	15	15				77
logitalia gestioni spa	3	3								6
lottomatica spa				13	15	15	15	13	13	84
luxottica group spa			7	7	7	9	12	12	14	68
m&c management & capitali spa									1	1
maffei spa	7	7	7	7	7	7	7	7	7	63
magneti marelli spa	11	11								22
manuli rubber industries spa	9	9	9	11	11	10				59
marangoni spa	7	7	7	7						28
marazzi group spa									14	14
marcolin spa		6	6	7	9	9	9	12	12	70
mariella burani fashion group spa			5	5	5	5	5	5	5	35
marr spa								7	7	14
marzotto spa - manifattura lane gaetano marzotto & figli	15	15	15	15	15	15	15	14	9	128
mediacontech spa								9	9	18
mediaset spa	21	21	19	19	19	15	15	15	15	159
mediobanca spa	21	21	21	21	21	21	20	20	20	186
mediolanum spa	10	10	10	12	12	12	12	12	12	102
mediterranea delle acque spa							5	5	5	15
meliorbanca spa			13	15	15	15	13	12	14	97
merloni elettrodomestici spa	9	9	10	11	13	13				65
meta modena energia territorio ambiente spa						9	9	8		26
milano assicurazioni spa	18	18	13	13	13	19	19	18	19	150
mirato spa		6	6	5	5	6	6	6	6	46
mittel spa	10	9	11	10	10	11	11	11	10	93
mondo tv spa								6	6	12
monrif spa	7	7	7	6	6	6	6	6	6	57
montedison spa	7	7	8	9						31
montefibre spa	8	9	8	8	8	8	8	8	8	73
napoletanagas spa - compagnia di illuminazione e riscaldamento col gas	7									7
navigazione montanari spa	9	8	8	8	8	8	10	9	10	78

necchi spa	9	7	7	8	8	5				44
negri bossi spa				5	4	3	6	6	6	30
nice spa									10	10
olcese spa	7		9	8	9	9				42
olcese spa - cotonificio olcese veneziano		6								6
olcese spa in amministrazione straordinaria							6			6
olidata spa		3	6	6	6	7	7	6	6	47
olivetti spa - ing. C. olivetti & c.	15	15	16	16	16					78
pagnossin spa	4	7	6	7	5	6	4	6	4	49
panariagroup industrie ceramiche spa							12	11	11	34
parmalat finanziaria spa	15	14	13	13	13					68
parmalat finanziaria spa in amministrazione straordinaria						8	4			12
parmalat spa								11	11	22
partecipazioni italiane spa							5	5		10
perlier spa	4	6	6	6	6	5				33
permasteelisa spa		6	6	6	8	8	8	8	10	60
petra spa	3									3
piaggio & c. spa									11	11
pierrel spa		1								1
pininfarina spa	8	9	9	9	9	9	9	9	8	79
pirelli & c. accomandita per azioni	5	5	5	5	5					25
pirelli & c. real estate spa					13	14	14	14	13	68
pirelli & c. spa						21	20	20	19	80
pirelli spa	17	19	18	18	19					91
poligrafica s. faustino spa								7	7	14
poligrafici editoriale spa	9	9	9	5	7	7	7	7	7	67
poltrona frau spa									11	11
polynt spa									5	5
premafin finanziaria spa holding di partecipazioni	7	7	7	7	7	11	11	12	12	81
premuda spa	7	9	8	9	9	9	9	9	9	78
prima industrie spa								7	7	14
procomac spa							8			8
ras holding spa							18	18		36
ras spa - riunione adriatica di sicurta'	20	20	20	20	19	16				115
ratti spa	7	7	6	5	5	6	5	5	6	52
rca mediagroup spa						18	18	19	19	74
recordati spa - industria chimica e farmaceutica	14	13	11	10	9	9	9	8	8	91
reno de medici spa	10	11	11	11	9	11	11	11	9	94
reply spa								7	7	14
retelit spa								7	8	15
reti bancarie holding spa						7				7
reti bancarie spa							9	9		18
richard ginori 1735 spa	7	6	4	8	7	8	9	7	3	59
risanamento napoli spa			6	6						12
risanamento napoli spa - societa' pel risanamento di napoli	11	11								22
risanamento spa					9	9	9	9	8	44
riva finanziaria spa	5	4								9
roland europe spa	3	5	5	5	5	5	5			33
rolo banca 1473 spa	19	19	18	18						74
roma vetus finanziaria spa	9	6								15
roncadin spa		8	8	8	5	7				36
rotondi evolution spa	7	9	9	9						34

sabaf spa	7	7	7	7	7	9	9	9	11	73
sadi servizi industriali spa							10	10	10	30
sadi spa	8	8	8	8	9	9				50
saeco international group spa			8	7	8	8				31
saes getters spa	11	11	13	14	14	14	14	14	14	119
safilo group spa								11	7	18
safilo spa - soc. az. fabbrica italiana lavorazione occhiali	6	6	6							18
sai spa - societa' assicuratrice industriale	15	15	15	15						60
saiag spa - industria articoli gomma	8	7	8	8	8					39
saipem spa	9	9	9	9	9	9	9	9	9	81
san paolo imi spa				14						14
sanpaolo imi spa					18	18	17	17	17	87
saras spa raffinerie sarde									8	8
savino del bene spa trasporti internazionali agenzia marittima	4	4	4	4	4					20
schiaapparelli 1824 spa	5	5	5	5	5	7	7	7	7	53
seat - pagine gialle spa	21	21	21	13	13					89
seat pagine gialle spa						13	13	13	13	52
sias - societa' iniziative autostradali e servizi spa					10	14	14	14	14	66
simint spa	5	5	5							15
sirti spa	12	7	11	11	11	13	13	13	13	104
smi spa - societa' metallurgica italiana	12	12	12	12	12	10				70
smurfit sisa spa	7	7	7	7	7	7	7	7	7	63
snai spa	9	9	9	9	9	9	8	9	9	80
snam rete gas spa				5	8	8	8	8	8	45
snia spa	11	11	12	12	13	12	9	9	7	96
so.pa.f. spa - societa' di partecipazioni finanziarie	7	7		6	6	6	6	9	9	56
societa' cattolica di assicurazione scarl			17	18	18	18				71
societa' cattolica di assicurazione societa' cooperativa							18	18	17	53
societa' sportiva lazio spa	9	13	13	14	10	9	2	2	2	74
socotherm spa					5	6	8	14	12	45
sogefi spa	11	10	10	10	10	11	12	11	11	96
sol spa	8	8	8	8	8	8	8	8	8	72
sondel spa - societa' nordelettrica	7	7	7							21
sopaf spa - societa' di partecipazioni finanziarie			6							6
sorin biomedica spa	9	9								18
sorin spa							12	12	13	37
stayer spa	5	5	5	5	3	5				28
stefanel spa	9	9	10	8	9	9	9	7	7	77
targetti sankey spa	6	6	7	8	8	10	10	11	11	77
tas tecnologia avanzata dei sistemi spa								5	5	10
tecnost spa	8	8	8							24
telecom italia media spa						14	13	13	13	53
telecom italia mobile spa	7	7	7	13	13	15	14			76
telecom italia spa	13	13	13	15	15	15	19	20	20	143
terme demaniali di acqui spa	9	9	11	11	11					51
terna - rete elettrica nazionale spa							10	10	10	30
tiscali spa								8	8	16
tod's spa			8	9	9	10	10	11	11	68
toro assicurazioni spa	11	11	11					15		48
trevi - finanziaria industriale spa		5	5	8	8	8	9	9	9	61
trevisan cometal spa							10	10	11	31
trevisan spa						6				6

txt e-solutions spa								5	5	10
uni land spa							6	5	5	16
unicem spa unione cementerie marchino emiliane spa	9									9
unicredito italiano spa	13	19	19	19	20	20	20	19	23	172
unimed - cementerie del mediterraneo spa			7	9						16
unione di banche italiane scpa							21	21	21	63
unione immobiliare spa	7	7								14
unipol spa - compagnia assicuratrice unipol	24	24	24	25	25	25	25	24	25	221
valentino fashion group spa								9	9	18
vemer elettronica spa		6								6
vemer siber group spa			7	6	7	7	7	7	7	48
vianini industria spa	5	5	5	5	5	5	5	5	5	45
vianini lavori spa	8	7	7	7	7	7	7	8	8	66
vittoria assicurazioni spa	14	14	14	15	15	14	15	16	16	133
zignago spa - industrie zignago s. margherita	12	11	12	12	12	12	12			83
zucchi spa - vincenzo zucchi	8	8	8	8	9	9	9	11	9	79
zucchini spa	8									8
totale complessivo	2172	2319	2341	2344	2351	2295	2301	2654	2608	21385

## Appendix 2. Listed companies according to Freeman degree 1998-2006

The Freeman Degree identifies the extent of connections of a director or of a company. It is a measure of local centrality, that is the potentiality to act or communicate with a specified number of directors. A high Freeman Degree can correspond to a low or high level of centrality with respect to the entire company network.

soc	1998	1999	2000	2001	2002	2003	2004	2005	2006	total
a.m.g.a. spa - azienda mediterranea gas e acqua		0								0
ac.e.ga.s. spa				10	4					14
acea spa		5	7	9	5	9	7	7	6	55
acegas - aps spa						5	4	4	4	17
acotel group spa								1	1	2
acqua pia antica marcia spa	3	1	3	2	0	0	0	0		9
acque potabili spa - societa' per condotta di acque potabili	5	4	3	2	3	2	1	6	3	29
acquedotto de ferrari galliera spa	5	5	2	4	5	3	2	4		30
acquedotto nicolay spa	3	4	2	4	5	3				21
acsm como spa		0	1							1
acsm spa				1	0	0	0	1	1	3
actelios spa					8	2	7	7	8	32
aedes spa							10	8	9	27
aedes spa - ligure lombarda per imprese e costruzioni	6	17	14	9	10	12				68
aem spa	0	1	1	2	3	3	3	4	5	22
aeroporti di roma spa	5	8	14							27
aeroporto di firenze - adf spa			0	3	1	1	2	4	5	16
aeroporto di venezia marco polo spa - save								2	3	5
air dolomiti spa - linee aeree regionali europee				1	1					2
alerion industries spa					4	11	9	11	11	46
algot spa in liquidazione								0		0
alitalia linee aeree italiane spa	7	8	1	3	2	0	1	1	1	24
alleanza assicurazioni spa	24	26	27	22	19	18	23	24	22	205
allianz subalpina spa	15	15	19							49
amga spa - azienda mediterranea gas e acqua	0		2	3	2	2	3	10		22
amplifon spa				2	2	2	4	4	4	18
anima sgr spa								5	5	10



ansaldo sts spa									1	1
ansaldo trasporti spa	1	1	0							2
arena agroindustrie alimentari spa							1	0	1	2
arnoldo mondadori editore spa	8	8	8	8	9	10	11	12	10	84
arquati spa	2	3	3	2	1					11
arquati spa in amministrazione straordinaria							0			0
arquati spa in liquidazione						0				0
as roma spa			4	2	0	0	0	0	0	6
ascopiave spa									0	0
asm brescia spa					5	10	10	7	8	40
assicurazioni generali spa	30	36	31	20	14	19	22	26	22	220
assitalia spa - assicurazioni d'italia	12	8								20
astaldi spa					2	2	2	3	3	12
atlantia spa							23	23	28	74
autogrill spa	15	19	20	24	26	23	23	24	23	197
autostrada torino milano spa	1	1	1	6	12	9	6	7	7	50
autostrade meridionali spa	0	0								0
autostrade spa						18				18
autostrade spa - concessioni e costruzioni autostrade	8	8	10	22	22					70
azienda energetica metropolitana torino			0	1	1	2				4
azimut holding spa							0	0	0	0
banca agricola mantovana spa	6	16	16	12	11					61
banca antoniana popolare veneta spa					26	16	14	5		61
banca carige spa - cassa di risparmio di genova e imperia	0	0	1	1	1	1	1	3	2	10
banca commerciale italiana spa	21	34	32							87
banca di legnano spa	5	8	9							22
banca di roma spa	8	10	6	7						31
banca fideuram spa	4	4	1	3	4	5	4	6	8	39
banca finnat euramerica spa						9	9	9	10	37
banca generali spa									15	15
banca ifis spa						0	0	0	0	0
banca interbancaria di investimenti e gestioni spa	1	9	10	8	9	9	9	13	9	77
banca intesa spa	13	29	32	22	14	14	18	19	17	178
banca italease spa								5	3	8
banca lombarda	18	13								31
banca lombarda e piemontese spa			14	13	13	15	15	11	10	91
banca monte dei paschi di siena spa	5	8	8	11	11	12	11	9	3	78
banca nazionale del lavoro spa	10	9	9	13	10	10	13	16		90
banca nazionale dell'agricoltura spa	4	8								12
banca piccolo credito valtellinese scarl	2	3	3	3	3	2				16
banca piccolo credito valtellinese societa' cooperativa							3	5	6	14
banca popolare commercio e industria scril	2	5	7	5	7					26
banca popolare dell'etruria e del lazio scarl	0	0	0	0	0	0	0	1	0	1
banca popolare di bergamo-credito varesino scril	5	4	5	9	14					37
banca popolare di cremona scril	0	0	0	0	0					0
banca popolare di cremona spa						0				0
banca popolare di intra scril	0	0	0	0	0	0				0
banca popolare di intra spa							0	2	2	4
banca popolare di lodi scril	2	3	4	4	6	9				28
banca popolare di milano scril	1	1	3	5	7	5	5	5	6	38
banca popolare di novara scril	2	2	3	2						9
banca popolare di spoletto spa	0	0	1	1	1	0	1	1	1	6

banca popolare di verona - banco s. geminiano e s. prospero	4	3	4	6						17
banca popolare italiana - banca popolare di lodi societa' cooperativa							7	10	5	22
banca profilo spa		0	0	0	0	0	0	0	2	2
banca san paolo di brescia spa	15									15
banca toscana spa	4	8	3	4	2					21
banche popolari unite scri						17				17
banco di chiavari e della riviera ligure spa	3	4	5	3	3					18
banco di desio e della brianza spa	10	8	7	5	7	8	7	9	7	68
banco di napoli spa	12	7	2	2						23
banco di sardegna spa	0	0	0	2	2	1	1	2	2	10
banco popolare di verona e novara scri					8	8	8	10	7	41
basic net spa		5	6	1	1	2	2	3	3	23
bassetti spa	4	4	5							13
bastogi spa	2	3	3	3	4	3	3	0	0	21
bayerische vita spa	0	0	0	0	0					0
beghelli spa	3	1	3	2	2	3	3	4	4	25
benetton group spa	7	9	12	19	21	20	20	18	15	141
beni stabili spa		1	2	13	11	10	2	2	3	44
biesse spa				0	0	2	3	2	1	8
bipielle investimenti spa					8	12	12	14		46
bipop - carire spa	2	1	1	3						7
boero bartolomeo spa	0	0	0	0	1	0	0	0	0	1
bolzoni spa									1	1
bonaparte spa	2	1	4	5						12
bonifica terreni ferraresi e imprese agricole spa	3	3	3	4	4	3	2	2	3	27
borgosesia spa	0	0								0
brembo spa - freni Brembo	5	4	8	3	3	3	4	3	4	37
brioschi finanziaria spa	0	1	1	1	1	3	3	0	0	10
bulgari spa	0	0	0	0	1	1	1	1	1	5
buongiorno spa								0	0	0
buzzi unicem spa		15	16	8	3	5	5	6	4	62
cad it spa								0	0	0
caffaro spa	7	5								12
cairo communication spa								1	1	2
calcemento spa - societa' per il calcestruzzo ed il cemento spa	2	2								4
calp spa - cristalleria artistica la piana	2	2	2	2	1					9
caltagirone editore spa			9	12	13	12	11	12	16	85
caltagirone spa	13	11	15	18	17	18	18	19	21	150
camfin cam finanziaria spa	32	33	32	32	29	20	22	24	20	244
capitalia spa					12	16	18	18	15	79
carraro spa	9	12	10	7	8	7	5	7	8	73
cartiere burgo spa	10	11								21
cassa di risparmio di firenze			3							3
cassa di risparmio di firenze spa				4	3	6				13
cassa di risparmio di firenze spa - banca cr firenze							3	4	8	15
castelgarden spa	3	3								6
cdc point spa								1	0	1
cembre spa	0	0	0	1	1	0	0	0	0	2
cementeria di augusta spa	9	9								18
cementeria di barletta spa	8	8	8							24
cementir spa - cementerie del tirreno	13	11	15	16	16	15	14	13	18	131
centenari e zinelli spa	0	0	0	0	1	1				2

centrale del latte di torino & c. spa			1	2	2	2	2	5	3	17
chl - centro hl distribuzione spa								0	0	0
ciccolella spa							0	0	0	0
ciga spa	0	0								0
cir spa - compagnie industriali riunite	22	26	23	18	22	22	24	27	25	209
cirio finanziaria spa	2			4	4					10
cirio finanziaria spa in amministrazione straordinaria						1				1
cirio spa		2	3							5
class editori spa	2	2	3	2	2	1	0	0	1	13
cmi spa	9	11	13	6						39
coats cucirini spa	0	0	0	0	0	0				0
cobra automotive technologies spa									2	2
cofide spa - compagnia finanziaria de benedetti	19	24	20	20	21	22	24	26	22	198
comau spa	9	9								18
compart spa - compagnia di partecipazioni assicurative ed industriali spa	16	18								34
credito artigiano spa		6	6	4	4	3	4	6	7	40
credito bergamasco spa	5	6	8	9	7	6	7	7	5	60
credito emiliano spa	8	9	10	11	6	6	5	4	2	61
credito fondiario e industriale spa	6	3	1							10
cremonini spa	2	2	2	2	2	2	1	3	4	20
csp - international industrie calze spa	0	0	0	0	0	0				0
csp international fashion group spa							0	0	0	0
dada spa								3	0	3
dalmine spa	6	5	7	6	8					32
danieli spa - officine meccaniche danieli & c.	2	2	6	7	6	2	2	2	2	31
data service spa								8	7	15
datalogic spa								4	7	11
datamat spa								0	0	0
davide campari - milano spa				14	13	15	12	8	5	67
de longhi spa				4	4	3	6	7	9	33
dea capital spa								19	16	35
deroma holding spa	0	0								0
digital bros spa								0	0	0
dmail group spa								0	0	0
dmt digital multimedia technologies spa							1	1	1	3
ducati motor holding spa		3	2	1	1	1	2	2	4	16
edison spa	7	8	6	8	6	9	7	10	9	70
eems italia spa									0	0
el.en. spa								3	4	7
elica spa									0	0
elios holding spa	0	0								0
emak spa	0	0	0	0	0	0	0	0	1	1
enel spa	0	2	0	2	2	2	3	3	3	17
enertad spa					1	4	5	4	9	23
engineering - ingegneria informatica - spa								0		0
eni spa	6	7	7	7	6	8	10	9	9	69
erg spa	0	1	1	2	3	1	1	2	5	16
ergo previdenza spa						0	3	3	4	10
ericsson spa	5	6	5	3	2	1	2			24
esaote spa	4	3	3	2	2					14
esprinet spa								0	0	0
eurofly spa								0	1	1

eurotech spa								0	1	1
eutelia spa								1	0	1
exprivia spa								1	2	3
falck spa	31	28	27							86
fastweb spa								9	9	18
ferretti spa			1	1	1					3
ferrovie nord milano spa	0	0								0
fiar spa - fabbrica italiana apparecchiature radioelettriche	1	1								2
fiat spa	23	23	23	21	14	16	11	15	20	166
fidia spa								4	0	4
fiera milano spa					0	0	0	2	0	2
filatura di pollone spa		0	0	0	0	0	0	0	0	0
fin.part spa	0	0	0	1	3	7				11
fin.part spa in fallimento							5	5		10
finarte - semenzato casa d'aste spa					1	0				1
finarte casa d'aste spa	0	5	5	1			3	2	1	17
fincasa 44 spa	0	1	6	4						11
fineco spa							6	7		13
finecogroup spa					8	6				14
finmatica spa		0								0
finmeccanica spa	8	12	12	8	12	6	7	7	8	80
finrex spa	3	3								6
fmr - art'e' spa - societa' internazionale di arte e cultura								2	1	3
fondiarria - sai spa					16	29	25	30	29	129
fullsix spa								2	2	4
gabetti holding spa	0	0	0	0	0	1				1
gabetti property solutions spa							2	8	3	13
garboli spa							0	0	0	0
garboli-conicos spa impresa generale di costruzioni	2	3	2	2	1	1				11
gas plus spa									1	1
gefran spa	1	1	1	2	3	2	3	5	4	22
gemina spa - generale mobiliare interessenze azionarie	4	7	9	12	8	7	10	8	8	73
geox spa							0	1	1	2
gewiss spa	0	3	4	4	3	3	3	5	4	29
giacomelli sport group spa				0	0					0
giacomelli sport group spa in amministrazione straordinaria						1				1
gildemeister italiana spa	0	0	0	0						0
gim spa - generale industrie metallurgiche	29	35	34	30	28	22	24	21	19	242
giovanni crespi spa	1	1	1	0	0	0	0	0	0	3
grandi navi veloci spa		2	1	3	3	0	1			10
granitifiandre spa				6	7	6	6	7	6	38
gruppo buffetti spa	4	4	4							12
gruppo ceramiche ricchetti spa	0	0	0	2	1	2	2	2	1	10
gruppo coin spa		2	0	0	0	3	3	0	0	8
gruppo editoriale l'espresso spa	25	30	21	22	24	21	22	22	19	206
guala closures spa								4	5	9
hera spa						2				2
hera spa (holding energia risorse ambiente)							2	5	3	10
holding di partecipazioni industriali spa	38	43	31	26	27					165
i grandi viaggi spa	0	0	0	0	0	0	0	0	0	0
i viaggi del ventaglio spa				2	4	5	4	5	0	20
i.m.a. industria macchine automatiche spa	0	0	1	1	2	2	0	1	1	8

i.net spa								1	3	4
idra presse spa	1	1	1	2						5
ifi spa - istituto finanziario industriale	19	19	19	19	17	16	15	17	20	161
ifil - finanziaria di partecipazioni spa	21			18	18	20				77
ifil investments spa							21	17	15	53
ifil spa - finanziaria di partecipazioni		19	18							37
igd immobiliare grande distribuzione spa								1	1	2
immobiliare lombarda spa		5	5	6	1	0	0	13	15	45
immobiliare metanopoli spa	1	2	1							4
immsi spa			2	2	0	12	12	12	16	56
impregilo spa	5	10	15	12	14	15	16	11	7	105
ina - istituto nazionale delle assicurazioni spa	18	23	13							54
indesit company spa							16	14	17	47
intek spa	0	1	0	1	1	1	1	7	8	20
interbanca spa	7	14	12	19	23					75
interpump group spa	8	12	9	5	5	7	7	13	15	81
investimenti & sviluppo spa							0	0	3	3
investimenti immobiliari lombardi spa		2	5	3						10
ipi spa	12			14	12	22	16	8	8	92
ipi spa - attivita' di investimento e promozione immobiliare		13	13							26
irce spa - industria romagnola conduttori elettrici	1	1	1	1	1	0	0	0	0	5
iride spa							2	0	5	7
isagro spa						2	3	4	5	14
istituto bancario san paolo di torino - istituto mobiliare italiano spa	9	10	12							31
it holding spa	0	0	0	1	0	1	0	0	1	3
italcementi spa fabbriche riunite cemento	25	24	26	21	23	16	23	21	22	201
italdesign-giugiaro spa		0	0	0	0					0
italfondiario spa - istituto italiano di credito fondiario	4	0	6							10
italgas spa - societa' italiana per il gas	4	3	3	3	4					17
italjolly spa - compagnia italiana dei jolly hotels	3	2	2	2	2	3	4	10	6	34
italmobiliare spa	13	13	14	12	15	15	14	18	16	130
itway spa								0	0	0
juventus football club spa				2	5	12	12	10	3	44
kaitech spa								0	0	0
kme group spa							11	12	11	34
la doria spa	0	0	0	0	0	0	1	0	0	1
la fondiaria assicurazioni spa	16	18	16	18						68
la gaiana spa	1	1	1	1	1	1	1	1	1	9
la rinascente spa	13	13	13	12	8					59
lavorwash spa			0	0	0	0	0	1	1	2
linificio e canapificio nazionale spa	9	8	7	13	11	9	10	10	10	87
locat spa	4	3	2	3	1	1				14
logitalia gestioni spa	3	3								6
lottomatica spa				6	3	3	4	12	4	32
luxottica group spa			10	8	3	5	15	14	16	71
m&c management & capitali spa									0	0
maffei spa	3	3	3	6	7	6	6	7	6	47
magneti marelli spa	12	12								24
manuli rubber industries spa	7	9	9	5	5	6				41
marangoni spa	0	0	0	0						0
marazzi group spa									6	6
marcolin spa		0	0	2	2	3	4	17	11	39

mariella burani fashion group spa			0	0	0	0	1	1	1	3
marr spa								1	1	2
marzotto spa - manifattura lane gaetano marzotto & figli	23	27	24	21	20	20	22	26	16	199
mediacotech spa								1	1	2
mediaset spa	11	12	10	11	12	12	12	17	14	111
mediobanca spa	50	52	58	44	51	47	44	47	36	429
mediolanum spa	10	8	8	10	11	11	10	15	15	98
mediterranea delle acque spa							2	6	3	11
meliiorbanca spa			2	10	7	16	6	8	7	56
merloni elettrodomestici spa	0	2	2	2	5	6				17
meta modena energia territorio ambiente spa						0	0	1		1
milano assicurazioni spa	15	17	16	12	7	23	19	21	22	152
mirato spa		0	0	0	0	0	0	1	1	2
mittel spa	13	6	11	10	10	10	10	10	9	89
mondo tv spa								0	0	0
monrif spa	6	7	7	6	7	5	5	5	3	51
montedison spa	11	12	16	7						46
montefibre spa	1	1	1	1	1	1	1	1	1	9
napoletanagas spa - compagnia di illuminazione e riscaldamento col gas	2									2
navigazione montanari spa	0	0	0	0	1	0	0	1	1	3
necchi spa	2	1	1	1	0	0				5
negri bossi spa				0	5	5	5	5	5	25
nice spa									2	2
olcese spa	0		4	3	1	2				10
olcese spa - cotonificio olcese veneziano		1								1
olcese spa in amministrazione straordinaria							2			2
olidata spa		0	0	0	0	0	0	0	0	0
olivetti spa - ing. c. olivetti & c.	14	37	41	50	54					196
pagnossin spa	2	3	2	4	2	4	4	2	2	25
panariagroup industrie ceramiche spa							2	1	1	4
parmalat finanziaria spa	11	14	12	3	4					44
parmalat finanziaria spa in amministrazione straordinaria						8	4			12
parmalat spa								9	8	17
partecipazioni italiane spa							0	3		3
perlier spa	0	0	0	0	0	0				0
permasteelisa spa		1	1	0	9	9	6	5	3	34
petra spa	5									5
piaggio & c. spa									16	16
pierrel spa		0								0
pininfarina spa	14	15	13	14	15	13	12	11	5	112
pirelli & c. accomandita per azioni	19	19	18	25	28					109
pirelli & c. real estate spa					27	19	17	15	6	84
pirelli & c. spa						59	54	56	46	215
pirelli spa	53	60	50	52	60					275
poligrafica s. faustino spa								1	1	2
poligrafici editoriale spa	11	11	12	5	8	8	7	8	5	75
poltrona frau spa									7	7
polynt spa									1	1
premafin finanziaria spa holding di partecipazioni	4	7	6	9	10	20	16	17	16	105
premuda spa	1	1	1	1	1	2	1	4	5	17
prima industrie spa								2	3	5
procomac spa							2			2

ras holding spa							32	31		63
ras spa - riunione adriatica di sicurta'	58	56	55	40	37	25				271
ratti spa	2	3	4	3	5	5	2	2	1	27
rcs mediagroup spa						35	43	47	33	158
recordati spa - industria chimica e farmaceutica	6	5	4	3	5	4	3	5	5	40
reno de medici spa	1	1	2	2	0	4	1	3	3	17
reply spa								1	1	2
retelit spa								6	5	11
reti bancarie holding spa						5				5
reti bancarie spa							1	1		2
richard ginori 1735 spa	2	3	2	4	2	4	4	2	2	25
risanamento napoli spa			7	7						14
risanamento napoli spa - societa' pel risanamento di napoli	0	5								5
risanamento spa					3	12	10	8	7	40
riva finanziaria spa	0	3								3
roland europe spa	0	0	0	0	0	0	0			0
rolo banca 1473 spa	23	18	23	19						83
roma vetus finanziaria spa	1	0								1
roncadin spa		6	7	0	0	2				15
rotondi evolution spa	0	2	1	1						4
sabaf spa	0	0	0	0	1	1	1	1	3	7
sadi servizi industriali spa							0	1	1	2
sadi spa	2	2	4	1	1	0				10
saeco international group spa			1	0	0	1				2
saes getters spa	3	4	4	4	5	7	8	7	5	47
safilo group spa								3	3	6
safilo spa - soc. az. fabbrica italiana lavorazione occhiali	2	2	4							8
sai spa - societa' assicuratrice industriale	8	11	10	15						44
saiag spa - industria articoli gomma	3	3	3	3	2					14
saipem spa	1	1	2	5	4	5	5	2	1	26
san paolo imi spa				10						10
sanpaolo imi spa					6	7	5	7	7	32
saras spa raffinerie sarde									6	6
savino del bene spa trasporti internazionali agenzia marittima	0	0	0	0	0					0
schiaapparelli 1824 spa	1	2	2	0	0	5	4	3	0	17
seat - pagine gialle spa	17	20	15	21	18					91
seat pagine gialle spa						6	7	8	9	30
sias - societa' iniziative autostradali e servizi spa					7	5	5	9	8	34
simint spa	0	0	0							0
sirti spa	5	2	11	10	16	12	15	17	9	97
smi spa - societa' metallurgica italiana	20	20	20	22	20	11				113
smurfit sisa spa	0	0	0	0	0	0	0	0	0	0
snai spa	0	0	0	0	0	0	0	0	0	0
snam rete gas spa				4	3	2	2	2	1	14
snia spa	23	18	17	18	23	22	14	13	5	153
so.pa.f. spa - societa' di partecipazioni finanziarie	5	5		6	7	7	7	10	5	52
societa' cattolica di assicurazione scarl			6	7	6	6				25
societa' cattolica di assicurazione societa' cooperativa							6	6	4	16
societa' sportiva lazio spa	4	4	5	4	4	6	0	0	0	27
socotherm spa					0	1	3	1	0	5
sogefi spa	19	23	21	19	19	19	21	16	12	169
sol spa	0	0	0	0	0	0	0	0	0	0

sondel spa - societa' nordelettrica	16	17	20							53
sopaf spa - societa' di partecipazioni finanziarie			4							4
sorin biomedica spa	6	6								12
sorin spa							21	17	5	43
stayer spa	0	0	0	0	0	0				0
stefanel spa	5	5	7	5	7	5	4	3	3	44
targetti sankey spa	2	2	2	0	0	0	0	1	1	8
tas tecnologia avanzata dei sistemi spa								4	5	9
tecnost spa	3	14	15							32
telecom italia media spa						19	20	12	15	66
telecom italia mobile spa	5	10	13	24	27	30	29			138
telecom italia spa	15	27	23	49	49	42	34	32	23	294
terme demaniali di acqui spa	4	4	4	5	5					22
terna - rete elettrica nazionale spa							1	5	4	10
tiscali spa								2	3	5
tod's spa			3	6	6	7	10	12	12	56
toro assicurazioni spa	18	20	17					15		70
trevi - finanziaria industriale spa		0	0	2	3	3	3	2	3	16
trevisan cometal spa							1	1	0	2
trevisan spa						1				1
txt e-solutions spa								3	3	6
uni land spa							0	0	0	0
unicem spa unione cementerie marchino emiliane spa	16									16
unicredito italiano spa	29	27	29	30	20	22	22	19	13	211
unimed - cementerie del mediterraneo spa			8	4						12
unione di banche italiane scpa							17	15	19	51
unione immobiliare spa	8	5								13
unipol spa - compagnia assicuratrice unipol	1	2	2	10	10	10	8	5	3	51
valentino fashion group spa								23	20	43
vemer elettronica spa		0								0
vemer siber group spa			8	4	4	4	6	7	0	33
vianini industria spa	11	9	10	10	10	10	11	10	11	92
vianini lavori spa	10	9	13	14	13	13	13	14	15	114
vittoria assicurazioni spa	6	5	6	5	6	7	10	12	13	70
zignago spa - industrie zignago s. margherita	9	8	8	8	11	13	13			70
zucchi spa - vincenzo zucchi	8	7	6	5	9	9	9	9	5	67
zucchini spa	4									4
totale complessivo	1622	1842	1808	1666	1688	1612	1620	1834	1594	15286

### Appendix 3. Listed companies according to Betweenness 1998-2006

Betweenness indicates the number of paths that pass through a node. In this context, a node indicates a company, and a path indicates the shortest route which relies two companies through board interlocks. Betweenness is a complementary measure with respect to the Freeman Degree because it allows to specify whether a director or a company have a central or peripheral position within the entire network.

soc	1998	1999	2000	2001	2002	2003	2004	2005	2006
a.m.g.a. spa - azienda mediterranea gas e acqua		0							
ac.e.ga.s. spa				35.714	6.848				
acea spa		34.608	340.924	794.105	881.888	942.389	589.556	333.494	213.811
acegas - aps spa						26.156	10.027	36.034	14.763
acotel group spa								0	0



acqua pia antica marcia spa	53.679	0	54.358	12.367	0	0	0	0	
acque potabili spa - societa' per condotta di acque potabili	679.936	378.083	101.94	101.995	56.255	0	0	4.881	0
acquedotto de ferrari galliera spa	773.547	579.38	110.829	602.269	731.388	498	332	0	
acquedotto nicolay spa	64.308	107.694	132.983	184.524	354	334			
acsm como spa		0	0						
acsm spa				0	0	0	0	0	0
actelios spa					182.596	168	222.637	128.013	354.58
aedes spa							111.742	119.643	259.723
aedes spa - ligure lombarda per imprese e costruzioni	252.669	0	304.744	122.829	91.693	217.834			
aem spa	0	0	0	89.634	256.952	103.483	65.103	0.5	81.643
aeroporti di roma spa	107.643	74.633	397.653						
aeroporto di firenze - adf spa			0	65.368	0	0	17.341	48.581	125.664
aeroporto di venezia marco polo spa - save								0	0
air dolomiti spa - linee aeree regionali europee				0	0				
alerion industries spa					95.617	540.629	421.702	671.739	719.823
algot spa in liquidazione								0	
alitalia linee aeree italiane spa	0	0	0	0	0	0	0	0	0
alleanza assicurazioni spa	964.006	559.11	577.855	721.75	487.732	582.957	608.621	1151.503	1049.374
allianz subalpina spa	207.227	146.731	248.699						
amga spa - azienda mediterranea gas e acqua	0		1	58.944	0	0	133.421	647.671	
amplifon spa				10.412	19.909	15.745	67.904	36.603	21.084
anima sgr spa								23.16	50.398
ansaldo sts spa									0
ansaldo trasporti spa	0	0	0						
arena agroindustrie alimentari spa							0	0	0
amoldo mondadori editore spa	8.388	176	171.643	83.54	23.106	27.233	183.894	223.316	17.917
arquati spa	165	350	174.077	110.299	0				
arquati spa in amministrazione straordinaria							0		
arquati spa in liquidazione						0			
as roma spa			0	0	0	0	0	0	0
ascopiave spa									0
asm brescia spa					416.042	542.403	312.489	93.443	261.986
assicurazioni generali spa	312.763	696.389	238.19	441.349	284.302	518.71	448.314	752.291	789.316
assitalia spa - assicurazioni d'italia	0	11.87							
astaldi spa					178	0	0	54.02	0
atlantia spa							536.875	1029.008	1185.565
autogrill spa	465.94	656.578	495.504	965.355	1267.117	483.062	464.745	614.882	779.265
autostrada torino milano spa	0	0	0	64.111	110.443	87.332	75.246	44.316	17.804
autostrade meridionali spa	0	0							
autostrade spa						366.522			
autostrade spa - concessioni e costruzioni autostrade	37.548	0	107.814	347.736	215.711				
azienda energetica metropolitana torino			0	0	0	11.995			
azimut holding spa							0	0	0
banca agricola mantovana spa	174.487	291.407	875.813	671.676	590.884				
banca antoniana popolare veneta spa					266.153	78.147	35.433	86.899	
banca carige spa - cassa di risparmio di genova e imperia	0	0	0	0	0	0	0	23.232	0
banca commerciale italiana spa	352.015	1308.372	1115.958						
banca di legnano spa	224.529	326.581	394.601						
banca di roma spa	45.059	102.404	115.134	556.636					
banca fideuram spa	147.809	205.732	0	9.511	5.046	74.267	120.869	261.157	743.725
banca finnat euramerica spa						178.754	332.162	247.525	161.913
banca generali spa									729.664

banca ifis spa						0	0	0	0
banca interbancaria di investimenti e gestioni spa	0	0	17.564	41.86	14.113	29.179	18.661	44.838	79.076
banca intesa spa	243.19	521.984	121.333	126.366	82.336	53.261	43.871	153.968	292.871
banca italease spa								114.507	88.353
banca lombarda	268.158	232.417							
banca lombarda e piemontese spa			298.941	545.65	456.884	543.906	512.104	370.723	443.279
banca monte dei paschi di siena spa	328	106.032	396.369	303.062	355	937.792	826.006	579.089	45.21
banca nazionale del lavoro spa	188.353	218.512	170.259	378.335	400.253	424.503	479.37	711.124	
banca nazionale dell'agricoltura spa	805	1.575							
banca piccolo credito valtellinese scrl	37.311	176	170	10.568	14.684	3.45			
banca piccolo credito valtellinese societa' cooperativa							3.333	3.793	5.05
banca popolare commercio e industria scrl	10.329	83.563	166.046	96.647	201.589				
banca popolare dell'etruria e del lazio scrl	0	0	0	0	0	0	0	0	0
banca popolare di bergamo-credito varesino scrl	251.033	205.692	192.149	677.342	751.605				
banca popolare di cremona scrl	0	0	0	0	0				
banca popolare di cremona spa						0			
banca popolare di intra scrl	0	0	0	0	0	0			
banca popolare di intra spa							0	195	194
banca popolare di lodi scrl	0	101.747	60.942	110.921	43.439	127.74			
banca popolare di milano scrl	0	0	38.009	221.61	349.248	168	129.349	91.447	244.142
banca popolare di novara scrl	94.152	54.416	99.074	26.609					
banca popolare di spoletto spa	0	0	0	0	0	0	0	0	0
banca popolare di verona - banco s. geminiano e s. prospero	0	0	0	0					
banca popolare italiana - banca popolare di lodi societa' cooperativa							40.107	36.866	812.124
banca profilo spa		0	0	0	0	0	0	0	194
banca san paolo di brescia spa	186.349								
banca toscana spa	0	114.718	0	18.428	0				
banche popolari unite scrl						352.667			
banco di chiavari e della riviera ligure spa	227.897	202.188	216.986	373.201	3				
banco di desio e della brianza spa	246.908	189.626	114.595	205.693	382.735	316.818	170.637	46.884	22.009
banco di napoli spa	0	0	0	0					
banco di sardegna spa	0	0	0	183	178	0	0	43.225	9.422
banco popolare di verona e novara scrl					153.039	140.51	70.274	287.965	359.318
basic net spa		0	0	0	0	168	167	8.284	14.798
bassetti spa	6.434	4.704	88.629						
bastogi spa	0	176	170	183	178	0	0	0	0
bayerische vita spa	0	0	0	0	0				
beghelli spa	33.315	0	0	0	0	0	0	0	0
benetton group spa	207.431	194.516	166.128	202.043	202.509	204.296	285.014	370.863	206.703
beni stabili spa		0	170	228.038	76.433	58.41	0	0	131.403
biesse spa				0	0	168	70.557	12.735	0
bipielle investimenti spa					179.396	448.462	487.827	587.102	
bipop - carire spa	165	0	0	364					
boero bartolomeo spa	0	0	0	0	0	0	0	0	0
bolzoni spa									0
bonaparte spa	0	0	338	72.833					
bonifica terreni ferraresi e imprese agricole spa	0	0	0	16.932	15.452	10.658	12.415	10.271	215.904
borgosesia spa	0	0							
brembo spa - freni Brembo	66.587	155.408	388.715	191.351	187.638	183.102	178.499	14.752	33.6
brioschi finanziaria spa	0	0	0	0	0	0	0	0	0
bulgari spa	0	0	0	0	0	0	0	0	0
buongiorno spa								0	0

buzzi unicef spa		390.207	474.676	218.924	29.618	36.349	40.847	148.961	83.563
cad it spa								0	0
caffaro spa	17.622	9.522							
cairo communication spa								0	0
calcestruzzo spa - societa' per il calcestruzzo ed il cemento spa	0	0							
calp spa - cristalleria artistica la piana	0	0	0	0	0				
caltagirone editore spa			0	611.976	675.986	458.554	125.422	213.098	450.747
caltagirone spa	108	0	0.25	210.727	151.567	373.493	49.197	32.617	18.83
camfin cam finanziaria spa	1483.435	882.354	455.147	741.268	628.734	278.765	402.257	618.723	892.5
capitalia spa					505.999	173.3	431.514	660.6	858.954
carraro spa	70.815	54.039	11.839	44.35	65.249	18.45	0	10.005	13.776
cartiere burgo spa	599.16	330.118							
cassa di risparmio di firenze			0						
cassa di risparmio di firenze spa				14.788	224.195	226.429			
cassa di risparmio di firenze spa - banca cr firenze							80.102	76.457	475.819
castelgarden spa	11.053	28.201							
cdc point spa								0	0
cembre spa	0	0	0	0	0	0	0	0	0
cementeria di augusta spa	124.175	63.881							
cementeria di barletta spa	0	0	0						
cementir spa - cimiterie del tirreno	108	0	0.25	17.73	23.561	0	173.227	161.99	232.584
centenari e zinelli spa	0	0	0	0	0	0			
centrale del latte di torino & c. spa			0	0	0	0	17.465	102.857	386
chl - centro hl distribuzione spa								0	0
ciccolella spa							0	0	0
ciga spa	0	0							
cir spa - compagnie industriali riunite	286.808	132.302	113.535	15.028	21.724	15.203	28.064	100.221	180.676
cirio finanziaria spa	0			14.215	18.087				
cirio finanziaria spa in amministrazione straordinaria						0			
cirio spa		0	0						
class editori spa	0	2.152	7.692	4.241	10.522	0	0	0	0
cmi spa	0	0	76.168	84.643					
coats cucirini spa	0	0	0	0	0	0			
cobra automotive technologies spa									0
cofide spa - compagnia finanziaria de benedetti	288.125	136.05	111.975	45.189	31.042	29.226	27.951	120.059	165.248
comau spa	11.61	10.758							
compart spa - compagnia di partecipazioni assicurative ed industriali spa	165.571	183.941							
credito artigiano spa		357.431	383.049	101.935	109.732	94.506	119.502	245.246	249.42
credito bergamasco spa	165	194.851	138.869	167.453	102.067	76.123	64.109	70.938	17.752
credito emiliano spa	29.257	63.635	31.357	117.044	27.652	26.982	7.983	11.163	3.975
credito fondiario e industriale spa	435.537	171.627	0						
cremonini spa	0	0	0	0	0	0	0	197.379	217.549
csp - international industrie calze spa	0	0	0	0	0	0			
csp international fashion group spa							0	0	0
dada spa								0	0
dalmine spa	654.712	224.756	129.511	303.577	186.123				
danieli spa - officine meccaniche danieli & c.	0	0	102.196	82.141	36.574	4.869	126.249	86.688	114.659
data service spa								239.458	251.513
datalogic spa								395.665	398.86
datamat spa								0	0
davide campari - milano spa				288.276	255.452	411.422	150.196	50.883	68.562
de longhi spa				33.065	19.013	12.009	58.566	64.745	213.108

dea capital spa								324.897	168.115
deroma holding spa	0	0							
digital bros spa								0	0
dmail group spa								0	0
dmt digital multimedia technologies spa							0	0	0
ducati motor holding spa		49.308	31.895	0	0	0	0	0	74.531
edison spa	43.97	49.764	186.847	296.402	914.343	466.148	326.754	726.589	462.308
eems italia spa									0
el.en. spa								14.933	200.676
elica spa									0
elios holding spa	0	0							
emak spa	0	0	0	0	0	0	0	0	0
enel spa	0	0	0	0	178	168	167.832	33.538	31.14
enertad spa					0	37.738	206.688	202.639	387.156
engineering - ingegneria informatica - spa									0
eni spa	88.395	342.003	158.162	178.877	97.594	221.355	309.336	229.756	92.677
erg spa	0	0	0	0	7.049	0	0	2.338	31.458
ergo previdenza spa						0	0	0	0
ericsson spa	137.362	80.884	46.163	0	0	0	0		
esaote spa	130.373	111.916	75.869	88.712	67.801				
esprinet spa								0	0
eurofly spa								0	0
eurotech spa								0	0
eutelia spa								0	0
exprivia spa								0	0
falck spa	260.149	253.342	358.985						
fastweb spa								546.374	542.187
ferretti spa			0	0	0				
ferrovie nord milano spa	0	0							
fiar spa - fabbrica italiana apparecchiature radioelettriche	0	0							
fiat spa	605.002	325.725	256.822	353.812	99.91	362.919	67.047	672.081	956.376
fidia spa								106.235	0
fiera milano spa					0	0	0	388	0
filatura di pollone spa		0	0	0	0	0	0	0	0
fin.part spa	0	0	0	0	207.97	377.692			
fin.part spa in fallimento							332	195	
finarte - semenzato casa d'aste spa					0	0			
finarte casa d'aste spa	0	71.116	64.092	0			44.227	1.148	0
fincasa 44 spa	0	0	273.543	120.461					
fineco spa							20.493	258.601	
finecogroup spa					50.58	18.831			
finmatica spa		0							
finmeccanica spa	192.511	584.778	697.662	410.179	647.384	356.789	589.555	485.878	330.978
finrex spa	0	0							
fmr - art'e spa - societa' internazionale di arte e cultura								195	0
fondiarina - sai spa					673.721	881.123	818.726	884.164	1028.248
fullsix spa								0	4.986
gabetti holding spa	0	0	0	0	0	0			
gabetti property solutions spa							167	266.97	229.471
garboli spa							0	0	0
garboli-conicos spa impresa generale di costruzioni	0	0	0	0	0	0			
gas plus spa									0

gefran spa	0	0	0	183	274.061	168	167	389	223.724
gemina spa - generale mobiliare interessenze azionarie	335.592	551.073	368.602	496.785	385.429	173.12	171.492	139.489	254.417
geox spa							0	0	0
gewiss spa	0	0	0	0	0	0	0	0	0
giacomelli sport group spa				0	0				
giacomelli sport group spa in amministrazione straordinaria						0			
gildemeister italiana spa	0	0	0	0					
gim spa - generale industrie metallurgiche	193.687	251.905	244.383	325.416	200.318	82.891	259.349	693.91	717.041
giovanni crespi spa	0	0	0	0	0	0	0	0	0
grandi navi veloci spa		0	0	183	178	0	0		
granitifandre spa				0	0	0	0	0	0
gruppo buffetti spa	2.5	38.288	0						
gruppo ceramiche ricchetti spa	0	0	0	0	0	0	0	0	0
gruppo coin spa		0	0	0	0	0	0	0	0
gruppo editoriale l'espresso spa	375.962	290.714	99.369	143.961	122.707	32.893	44.059	69.506	891.048
guala closures spa								88.297	80.131
hera spa						17.527			
hera spa (holding energia risorse ambiente)							5.281	327.825	146.722
holding di partecipazioni industriali spa	1677.957	2451.808	1371.234	1295.58	1175.203				
i grandi viaggi spa	0	0	0	0	0	0	0	0	0
i viaggi del ventaglio spa				0	0	0	0	0	0
i.m.a. industria macchine automatiche spa	0	0	0	0	178	0	0	0	0
i.net spa								0	386
idra presse spa	0	0	0	0					
ifi spa - istituto finanziario industriale	37.073	28.485	93.186	310.957	223.02	110.113	111.35	166.414	564.581
ifil - finanziaria di partecipazioni spa	107.815			133.695	420.038	410.642			
ifil investments spa							296.983	130.588	163.568
ifil spa - finanziaria di partecipazioni		28.485	38.647						
igd immobiliare grande distribuzione spa								0	0
immobiliare lombarda spa		0	22.711	536.801	0	0	0	195	236.705
immobiliare metanopoli spa	0	0	0						
immsi spa			3.447	183	0	670.079	711.416	313.694	491.547
impreglio spa	175.102	807.495	993.903	253.839	514.117	356.819	466.415	304.512	98.047
ina - istituto nazionale delle assicurazioni spa	318.247	630.475	86.638						
indesit company spa							1131.634	711.242	1121.498
intek spa	0	0	0	0	0	0	0	1.879	14.312
interbanca spa	1290.043	986.07	184.863	209.773	286.906				
interpump group spa	39.082	231.01	420.667	448.53	480.612	122.304	116.368	502.922	612.104
investimenti & sviluppo spa							0	0	22.655
investimenti immobiliari lombardi spa		0	0	73.123					
ipi spa	171.608			303.221	436.686	470.756	537.386	67.496	93.331
ipi spa - attivita' di investimento e promozione immobiliare		202.351	594.708						
irce spa - industria romagnola conduttori elettrici	0	0	0	0	0	0	0	0	0
iride spa							30.155	0	75.02
isagro spa						5.934	16.277	173.212	109.538
istituto bancario san paolo di torino - istituto mobiliare italiano spa	684.673	159.699	263.935						
it holding spa	0	0	0	0	0	0	0	0	0
italcementi spa fabbriche riunite cemento	317.619	160.596	337.874	473.131	154.567	51.585	740.019	670.105	548.047
italdesign-giugiaro spa		0	0	0	0				
italfondiario spa - istituto italiano di credito fondiario	206.059	0	175.908						
italgas spa - societa' italiana per il gas	329	176	191.083	31.498	27.493				
italjolly spa - compagnia italiana dei jolly hotels	36.415	0	0	0	0	0	0	15.393	209.67

italmobiliare spa	320.735	254.495	84.149	242.657	31.733	13.692	13.154	237.309	227.565
itway spa								0	0
juventus football club spa				0	42.472	8.798	37.293	22.961	6.377
kaitech spa								0	0
kme group spa							3.848	126.9	155.874
la doria spa	0	0	0	0	0	0	0	0	0
la fondiaria assicurazioni spa	565.058	751.707	681.561	1482.371					
la gaiana spa	0	0	0	0	0	0	0	0	0
la rinascnte spa	31.418	11.032	17.127	23.101	0				
lavorwash spa			0	0	0	0	0	0	0
linificio e canapificio nazionale spa	0	0	0	334.117	260.881	222.077	219.559	226.761	154.535
locat spa	0	0	0	0	0	0			
logitalia gestioni spa	0	0							
lottomatica spa				183.831	59.672	16.295	26.839	408.444	228.398
luxottica group spa			31.862	36.246	2.297	12.127	242.947	446.37	647.962
m&c management & capitali spa									0
maffei spa	0	0	0	0	0	0	0	0	0
magneti marelli spa	136.107	204.265							
manuli rubber industries spa	0	0	65.677	87.29	34.762	91.621			
marangoni spa	0	0	0	0					
marazzi group spa									86.371
marcolin spa		0	0	0	0	0	0	713.076	696.392
mariella burani fashion group spa			0	0	0	0	0	0	0
marr spa								0	0
marzotto spa - manifattura lane gaetano marzotto & figli	576.879	954.442	882.544	884.339	409.803	488.318	448.91	750.376	210.542
mediacontech spa								0	0
mediaset spa	271.791	322.253	74.885	82.687	56.719	6.959	27.677	191.6	339.687
mediobanca spa	846.899	871.842	1825.219	2355.615	2350.234	1164.718	986.33	1524.077	1192.814
mediolanum spa	177.358	291.862	376.171	683.981	713.068	409.973	324.701	444.746	416.636
mediterranea delle acque spa							167	4.881	0
meliorbanca spa			72.066	1387.732	810.425	1293.605	270.811	396.736	417.041
merloni elettrodomestici spa	0	0	0	0	346.307	240.55			
meta modena energia territorio ambiente spa						0	0	0	
milano assicurazioni spa	136.081	215.999	286.853	360.234	47.97	278.263	129.913	130.616	377.97
mirato spa		0	0	0	0	0	0	0	0
mittel spa	442.258	9.448	28.823	86.942	71.616	51.422	39.602	458.005	383.775
mondo tv spa								0	0
monrif spa	0	0	0	10.787	11.193	0	0	0	0
montedison spa	124.58	143.46	188.007	250.584					
montefibre spa	0	0	0	0	0	0	0	0	0
napoletanagas spa - compagnia di illuminazione e riscaldamento col gas	0								
navigazione montanari spa	0	0	0	0	0	0	0	0	0
necchi spa	0	0	0	0	0	0			
negri bossi spa				0	0	0	0	0	26.417
nice spa									194
olcese spa	0		228.797	206.153	0	0			
olcese spa - cotonificio olcese veneziano		0							
olcese spa in amministrazione straordinaria							0		
olidata spa		0	0	0	0	0	0	0	0
olivetti spa - ing. c. olivetti & c.	278.352	1415.616	1802.526	2085.832	2129.524				
pagnossin spa	0	0	0	0	0	0	0	0	0
panariagroup industrie ceramiche spa							2	0	0

parmalat finanziaria spa	557.206	635.164	417.38	36.463	77.035				
parmalat finanziaria spa in amministrazione straordinaria						333.454	76.816		
parmalat spa								632.256	613.454
partecipazioni italiane spa							0	6.876	
perlier spa	0	0	0	0	0	0			
permasteelisa spa		0	0	0	14.234	25.652	182.753	20.697	31.142
petra spa	12.237								
piaggio & c. spa									568.692
pierrel spa		0							
pininfarina spa	274.736	216.141	191.69	159.979	405.976	368.301	477.671	173.686	103.151
pirelli & c. accomandita per azioni	58.55	111.727	5.545	17.479	14.811				
pirelli & c. real estate spa					482.901	108.276	73.48	135.986	41.702
pirelli & c. spa						1635.933	1860.264	3167.294	3280.198
pirelli spa	1395.999	1154.36	625.753	2067.12	1100.181				
poligrafica s. faustino spa								0	0
poligrafici editoriale spa	25.341	43.728	64.846	0	9.059	27.398	26.217	27.361	194
poltrona frau spa									158.091
polynt spa									0
premafin finanziaria spa holding di partecipazioni	0	124.961	141.461	160.224	132.167	355.363	348.358	228.981	295.381
premuda spa	0	0	0	0	0	36.269	0	28.214	65.657
prima industrie spa								0	14.59
procomac spa							2		
ras holding spa							932.653	1280.437	
ras spa - riunione adriatica di sicurtà	2030.759	1696.096	1301.471	827.66	863.617	454.97			
ratti spa	82.287	19.38	68.789	39.167	33.638	21.651	4.539	4.644	0
rca mediagroup spa						1229.456	1391.94	1522.533	987.167
recordati spa - industria chimica e farmaceutica	189.098	183.395	45.221	0	178	0	0	109.074	164.626
reno de medici spa	0	0	1	0	0	171.974	0	29.154	11.066
reply spa								0	0
retelit spa								48.996	53.722
reti bancarie holding spa						19.035			
reti bancarie spa							0	0	
richard ginori 1735 spa	0	0	0	0	0	0	0	0	0
risanamento napoli spa			592.991	102.854					
risanamento napoli spa - societa' pel risanamento di napoli	0	525							
risanamento spa					128.042	250.51	194.236	296.27	163.24
riva finanziaria spa	0	176							
roland europe spa	0	0	0	0	0	0	0		
rolo banca 1473 spa	357.64	223.505	244.169	297.183					
roma vetus finanziaria spa	0	0							
roncadin spa		176	170	0	0	0			
rotondi evolution spa	0	0	0	0					
sabaf spa	0	0	0	0	0	0	0	0	208.15
sadi servizi industriali spa							0	0	0
sadi spa	0	0	89.218	0	0	0			
saeco international group spa			0	0	0	0			
saes getters spa	0	0	0	0	0	86.86	157.324	141.749	124.649
safilo group spa								15.333	1.389
safilo spa - soc. az. fabbrica italiana lavorazione occhiali	0	0	75.835						
sai spa - societa' assicuratrice industriale	517.467	467.232	390.453	773.316					
saiag spa - industria articoli gomma	165	176	170	183	178				
saipem spa	0	0	260.205	278.097	315.112	168	167	0	0

san paolo imi spa				295.768						
sanpaolo imi spa					42.12	172.134	183.243	398.137	985.211	
saras spa raffinerie sarde									121.04	
savino del bene spa trasporti internazionali agenzia marittima	0	0	0	0	0					
schiaapparelli 1824 spa	0	0	0	0	0	0	0	0	0	0
seat - pagine gialle spa	999.101	940.705	302.092	183.649	332.508					
seat pagine gialle spa						529.374	137.796	198.422	274.374	
sias - societa' iniziative autostradali e servizi spa						0	6.269	16.734	119.293	69.626
simint spa	0	0	0							
sirti spa	179.7	9.097	331.521	366.594	641.24	285.494	628.343	692.673	417.372	
smi spa - societa' metallurgica italiana	262.666	240.332	267.467	711.315	511.774	146.389				
smurfit sisa spa	0	0	0	0	0	0	0	0	0	0
snai spa	0	0	0	0	0	0	0	0	0	0
snam rete gas spa				0	0	0	0	0	0	0
snia spa	912.343	564.948	619.999	1364.332	2135.646	1444.443	124.685	121.152	51.332	
so.pa.f. spa - societa' di partecipazioni finanziarie	61.095	71.547		102.398	111.714	52.184	98.708	307.758	125.433	
societa' cattolica di assicurazione scarl			92.77	127.799	48.263	51.183				
societa' cattolica di assicurazione societa' cooperativa							26.94	40.74	35.05	
societa' sportiva lazio spa	165	176	170	163.833	170.39	0	0	0	0	0
socotherm spa					0	0	2	0	0	0
sogefi spa	113.079	77.99	120.849	74.927	51.822	8.392	14.319	5.712	0	0
sol spa	0	0	0	0	0	0	0	0	0	0
sondel spa - societa' nordelettrica	356.019	566.877	482.957							
sopaf spa - societa' di partecipazioni finanziarie			10.49							
sorin biomedica spa	83.705	81.965								
sorin spa							775.081	297.978	87.467	
stayer spa	0	0	0	0	0	0				
stefanel spa	328	350	230.317	3.518	70.725	20.088	2.055	17.668	0	0
targetti sankey spa	0	0	0	0	0	0	0	0	0	0
tas tecnologia avanzata dei sistemi spa								0	95.914	
tecnost spa	0	91.219	157.817							
telecom italia media spa						252.476	575.165	445.762	845.141	
telecom italia mobile spa	33.033	345.915	589.714	608.662	604.016	919.392	574.153			
telecom italia spa	803.295	1047.878	523.644	2120.525	2043.115	1354.654	843.001	979.757	650.828	
terme demaniali di acqui spa	0	0	0	31.383	23.698					
terna - rete elettrica nazionale spa							0	590.567	74.809	
tiscali spa								10.751	34.859	
tod's spa			28.122	41.384	309.873	104.419	104.457	278.723	274.582	
toro assicurazioni spa	211.692	166.521	91.764					282.301		
trevi - finanziaria industriale spa		0	0	0	12.888	6.645	8.532	0	194	
trevisan cometal spa							0	0	0	
trevisan spa						0				
txt e-solutions spa								0	0	
uni land spa							0	0	0	
unicem spa unione cementerie marchino emiliane spa	478.849									
unicredito italiano spa	119.944	461.964	398.203	800.99	541.227	526.404	580.629	531.685	267.671	
unimed - cementerie del mediterraneo spa			0	0						
unione di banche italiane scpa							387.066	488.517	724.853	
unione immobiliare spa	52.75	287.388								
unipol spa - compagnia assicuratrice unipol	0	0	0	166.276	127.34	446.475	95.418	110.018	67.688	
valentino fashion group spa								476.339	853.418	
vemer elettronica spa		0								



vemer siber group spa			0.5	114.33	3.862	24.476	58.387	22.218	0
vianini industria spa	108	0	0.25	17.73	23.561	0	0	0	0
vianini lavori spa	0	0	0.25	17.73	23.561	0	0	0	0
vittoria assicurazioni spa	73.379	58.13	120.693	87.593	80.08	192.382	311.947	532.702	763.787
zignago spa - industrie zignago s. margherita	0	0	2.01	9.288	31.345	18.396	10.5		
zucchi spa - vincenzo zucchi	9.441	10.63	38.105	0	216.336	74.502	59.409	0	59.737
zucchini spa	0								

#### Appendix 4. Directors according to betweenness 1998-2006

The Table represents the betweenness for directors in 1998-2006 with average betweenness higher than zero. In the first column (Levels), colours indicate levels of betweenness: orange values under or equal the 0.25 percentile (betweenness=0) red values equal or above the 0.75 percentile (betweenness=12341.5). the second column (Differences) negative values are represented in orange and positive values in red.

dir	1998	1999	2000	2001	2002	2003	2004	2005	2006
abete luigi	0	0	5028.727	18747.98	7298.532	1939.02	1745.83	10656.49	2941.064
abravanel roger								0	17595.57
acutis carlo	5961.121	5369.578	2358.678	23783.73	21768.55	26831.57	33667.15	40026.05	69772.48
adler lionello	30024.04	11461.29	0	0					
agarini luigi	0	233.735	154.499	0	0	23575.92			
agnelli andrea							0	0	1359.063
agnelli umberto	26.349	5.333	153.938	172.575	154.868	8129.556			
ago francesco	0	0	0	0	0	0	0	36	36
agostoni paolo	15179	16115	24939.68						
agrusti raffaele					0	0	7103.621	19761.77	7428.848
aiello antonio	0	0	4975.922		0	0	0		
ainis guido	4642.581	7157.587	15075.4	3287.958	0				
alateri di genola e suniglia gabriele				13395.63					
alberti piergiorgio	0	0	0	0	0	0	0	35332.81	6769.261
alcini pasquale	0	0	0	0	2.928	2.611	530.871	593.803	496.324
aleotti filippo			0	12120	12048	0	0	0	0
alessandria giuseppe	263.3								
alpa piero guido	0	0	85	25602	25449	0	0		
andriani antonio silvano	0			1338.065	1455.715	0	0	0	0
andrioli danilo	0	0	2664.085	2497.335	0	0	0	0	0
anfossi giuseppe	0	0	0	0	0	0	0	77.759	0
angiolini guido	6424.481	5549.296	0	253.172	0	12532.83	0		
antinori piero	0	0	5527.608	32665.84	23968	22864	5355.949	4838.336	8825.623
antonini fabrizio	1124.863	18.667	0	0	0				
arcelli mario	21103.23	15939.94	18441.58	19696.54	20729.07	12380.21			
arcuti luigi	10333.42	0	0						
arletti william	3259.238	3578.667	5416	6036	0	0			
arnaudo luigi	2510.659	99.26	73.129	105.267	2016.378	0			
arona enrico	0	0	0	0	341.193	1268.818	2079.397	1032.711	658.476
arpe matteo				0	0	13561.37	11702.55	19637.63	8294.323
asquini franco	3259.238	3578.667	5416	6036	0	0			
attanasio leonardo gregorio		3583.232	4259.868						
autheman marc antoine	0	0	468.665	0	0				
bacchiddu bruno			2165.217	34426.61	78	0	0		
baessato paolo								0	12587.52
baglioni marco			0		0	10066	0	0	0

bagnai rossano				11567.63	10804.97					
baldi carlo	0	0	0	0	0	0	0	0	108	
barachini enrico	20819.91	11044.19	7954.827	0	7438.566	11984.32	6342.974	9822	0	
baratta paolo	0	0	0	0	0	0	21232.8	15935.59	0	
barbaro francesco	0	0	0	0	0	0	14150	16330	0	
barel di sant'albano carlo										8571.031
barlassina francesco	19956.62									
baroni bassano	0	11339	11432.5	4642.103	5159.767	0				
bartholomew reginald		0	0	0	1090.693	886.313	1366.566	1248.994	0	
bartolomei corsi maurizio	0	0	0	0	0	0	0	168	0	
barzaghini gianfranco	4040.649	3020.754	2033.25	1893.75	0	0	0	0	0	
baseggio giulio	1721.299	1067.229								
battiato lorenzo	5513.488	0	0							
bazoli giovanni	35927.43	11627.6	15335.02	19744.17	19775.65	21840.93	15129.39	27832.7	33960.13	
bazzano roberto	0	0	0	0	0	0	0	848.284	0	
bellaveglia stefano	2935.333	1496.771	4623.72	1135.592	403.737	0	0	0		
bellei franco	331.135	1035.913	667.204	2247.71	0	0	0	0	0	
belloni antonio	25297.4	0	0		0	10138.56	6010.35	22615.71	0	
ben ammar tarak	10128	0	0	0	0	0	0	0	0	
benaglio enrico				0	0	0	0	6103.034	0	
benassi lino	7120.026	10991.02	1541.414	1077.384		0	0	7308.951	0	
benedini benito		0	468.665	0	0	0	0	0	0	
benetton alessandro	17292.83	38920.34	44313.18	20928.41	11546.62	8638.914	25412.69	18529.81	776.545	
benetton gilberto	16333.35	17567.94	14792.86	55582.29	140041.8	71297.66	61795.77	68241.83	64987.32	
benevento giovanni	0	0	0	0	2343.875	6238.986	2379.072	332.204		
berlusconi marina elvira	3258.216	7608.613	9682.39	10143.36	6133.776	4220.918	4625.077	5785.549	3190.021	
berlusconi piersilvio	3258.216	1307.682	662.491	473.518	565.288	387.913	827.961	1172.235	795.758	
bernabe' franco	0	0	0	0		0	0	0	4880.137	
bernardini mara						0	0	11452	0	
bernazzi massimo	0	0	0	4390.43	0	0	0	0	0	
bernheim antoine	564.378	1044.561	937.301	2764.585	15453.55	10299.12	21243.27	32260.34	34139.23	
bertazzo carlo			0	4514.633	13198.25	962.295	783.05	0	0	
bertazzoni roberto	4985.119	10216.62	8895.039	9937.383	2472.375	4962.233	4171.2	4078.21	4415.603	
bettinzoli angelo	0	0	0	0	9048	11496	11336	13080	3654.69	
biancardi paolo	354.472	0	0	0	0	0	0	0	0	
bianchi luigi arturo	0	0	1179.86	1517.266	0	2744.336	4055.874	15880.55	17297.31	
bianchi tancredi	5059.651	13140.41	14644.68	19489.97	753.921	1114.078	0	0	0	
biasi paolo	0	3637.829	937.301	0	0	0		0		
biesuz giuseppe									10	
bifulco rosario			0	0	0	0	0	0	3383.754	
bigatti gianfranco	7608	8076	8142	0	0	0	0	0	0	
bini mauro						0	0	0	22806	22946
blasi paolo									0	16430
bodo giorgio	5278.995	5467.014								
boidi stefano		19815	0	0						
bombassei alberto	0	10888.72	14765.98	5203.238	4598.81	5337.706	35528.36	34807.57	32631.32	
bonato oliviero	0	0	7616	859.413	0	1459.259	0	0	0	
bonatti enrico				0	3241.79				0	0
bondi enrico	18609.65	46670.5	19989.48	10832.57	8176.49				0	0
bonferroni franco								14360.61	11383.48	
bonomi campanini andrea giuseppe							4795.546	2690.662	7572.36	
borghesi amaldo			0	0	0	0	0	0	0	10541.82

borlone pompeo	150.819	199.965	305.566	0	0	0	0	0	0
boroli marco	25553.34	20135.32	12775.22	0	8817.405	5430.529	4282.301	21292.61	0
borrini amerigo					0	11118.65	11336	19795.84	41049
bortuzzo antonio					0	0	0	0	27812
boscarato maurizio			0	0	0	0	0	1199.49	2941.064
boselli mario	0	0	3895.392	3080.127	1400.662	1745	2422.814	2790.089	8240
bossini leonardo		909.521	1370.632	14183.25	0	0	259.716	256.785	0
bracaloni romano	369.235	424.756	1258.343	1482.43	2161.493				
bracchi giampio	4463.986	6797.29	0	0	0	0	3143.257	10418.4	14140.18
bracco diana	0	4054.697	3453.807	0	0				0
bragantini salvatore								0	29649.49
brambilla giorgio			0	17148.21	16143.3				
brandolini d'adda tiberto	0	0	0	0	0	0	10465.84	13492.42	13758.78
brega oliviero maria	0	0	524.931	249.332	215.936	35.136	49.144	187.345	0
brignone marco	2559.323	0	0	0	0	0	0	0	0
broggini gerardo	10822.43	13121.85	9150.657	4121.95	3809.445	11699	20171.48	19970.68	18327.98
brugnoli giampaolo	4535.955	3815.646	0	0	0	0	0	0	0
brundi gian carlo	0	0	16212	0	0				
brunelli massimo saverio		2894.111	2096.891	7590					
brunetti giorgio	280.934	307.114	346.866	8929.513	8941.136	8480.317	2324.055	4187.822	3595.415
bruno egidio giuseppe	6581.267								
bulgheroni antonio	5950.143	3819.479	4451.482	7311.959	18582.08	7984.924	6575.08	8600.833	10104.1
buora carlo	9139.75	5469.444	4608.694	45379.54	96253.14	59352.57	38797.99	39678.29	2911.825
burani giovanni valter			0	0	0	0	96	40	40
buroni lucia						6.667	6.667		
businaro ferdinando	0	8076	0	0	0	0	0	0	0
busnelli massimo		12087	12186	13626	13545	6.667	6.667	0	0
bussolotto pio					0	3567.863	9445.273	7137.288	15229.84
buzzi alessandro	4040.649	3020.754	2033.25	1893.75	0	0	0	0	0
buzzi enrico	4040.649	3020.754	2033.25	1893.75	0	0	0	0	0
buzzi franco	4040.649	3020.754	2033.25	1893.75	0	0	0	0	0
buzzi pietro			9187.714	3586.222	5583.966	5617.951	6068.972	11799.77	9939.276
cacopardi italo	0	9415	8142	1539.413	1205.731	0	0	0	0
callieri carlo	263.3	3857.755	6091.815	60560.67	58614.2	30724.58	259.716	256.785	0
caltagirone alessandro	0	0	1.492	1.492	1.478	1.492	297.578	236.895	1461.401
caltagirone azzurra			0	0	0	0	0	0	1025.344
caltagirone edoardo	1.267	1.795	1.687	308.341	224.191	1248.678	556.322	473.608	525.393
caltagirone francesco	28778.17	4.129	1.687	308.341	224.191	8075.762	2052.453	1850.81	3156.511
caltagirone francesco gaetano	0	0	9.75	21350.42	17262.81	67237.89	12113.57	7235.687	15296.81
caltagirone gaetano	1.267	1.795	19.437	5019.715	5547.462	21.952	44.217	234.835	255.129
camadini giuseppe	737.306	0	10535.55	16363.28	9137.188	9555.938	7760.578	8772.34	11446.35
camerana carlo	6740.369	7015.324	2920.781	9310.388	14496.17				
cannatelli pasquale	0	0	0	0	0	4220.918	4625.077	5785.549	19616.73
cantarella paolo	12290.14	9980.859	4173.61	3850.963			0		0
capece minutolo massimiliano				0	0	0	0	100.62	32.32
capotosti sandro		0	0	0	0	0	0	0	13160
cappone michele						0	0	716.266	0
cappugi luigi	0	0	0	2359.846	2300.399	1001.283	8628.106	6543.997	7462.688
caputi massimo					0	20589.01	17170.84	18938.36	8101.353
caracciolo carlo	1098.241	548.993	643.131	275.277	330.016	225.377	111.897	374.902	0
carbonato gianfranco								0	3061.943
carbone sergio	4345.879	12076.38	14919.03	0	0	0	15443.09	0	13160

cardarelli pasquale lino	5080	14779	7158.798	4395.344	0				
caretti francesco	3143.26	0	10926.05	11896.35	10194.12	1488.815	411.123		
carlevaris carlo	10890.87	120.829	188.67	14976.27	13391.76	9777.963	4340.822	5195.799	4317.739
carnevale maffe' carlo alberto								36	36
carpaneda michele		0	0	0	0	12569.25	8985.333	2182.667	
casella mario	24687.5	24504.94	17606.65	0					
casini silvano	399.608	352.477							
cassaro renato	12694.22	9426.387						0	0
cassese sabino			0	0	0	0	7146.074		
castellano carlo	1667.646	0	0	0	0				
castellino onorato	21297.13	13164.37	15215.25	0	0	0	0	0	0
castellucci giovanni			0						10757.29
cattaneo ernesto				0	0	1268.818	2079.397	1032.711	658.476
cattaneo flavio		0	0		0	0	0	46806	0
cattaneo mario	4260.436	25345.08	20356.9	24497.41	17283.42	28301.37	35112.05	23647.42	14249.89
catturi giuseppe	0	0	0	0	6020	0	0	0	
cavallera piergiorgio	0	0	119	0	0	0	0	0	
cavallini giovanni	0	0	0	0	0	0	0	5670.254	4271.422
cefis giorgio camillo marcello	6374.595	17573.08	16269.9	6530.439	3742.906	142.136	91.564	163.154	1648
celli pier luigi						0	0	27560.64	2346.593
ceola antonio	4896.715	4071.971	2160.833	4698.02	6456.684	2284.83			
cera roberto			0	11093.46	816.866	0	4532.29	5575.607	9136.357
cerchiai fabio	1100.317	4144.297	12357.25	12630.55	14335.34	0	0	0	0
ceretti paolo							0	2048.008	0
cerutti giancarlo	0	0	0	0	7158.067	3492.248	3069.865	19741.11	0
cesarini francesco				10685.9					
chiarva gianni maria			0	0	0	0	0	5476.154	3809.797
ciampicali pier antonio			0	0	0			48	58392
ciani carlo	1685.333	40795.27	48889.73	69549.06	0		0	0	0
ciliberto mario		1.952	3.6	3.6	3.567	3.067	268.751	0	0
cimoli giancarlo							5684	6556	4950
cingano francesco	564.378	1044.561	937.301	2764.585	6223.758				
cipolletta innocenzo	8140.039	19200.57	7295.723	25266.34	14209.49	8634	18258.44	5656.527	2808.276
cirla giorgio	0	4305.875	9168.138	30494.09	51745.91	10361.98	0	0	2849.482
civardi giuseppe							2		
civaschi aldo	0	5592.143	0						
clo' alberto	0	14088.74	9855.566	12689.45	4330.112	23867.07	52258.23	45143.8	51439.47
colaninno matteo						0	0	0	1954.551
colaninno michele									1954.551
colaninno roberto	5629.829	34091.7	63700.89	32043.22	0	18626.6	21892.94	12715	41003.37
colao vittorio amedeo			0	0		0	2930.25	29325.24	
colavolpe roberto	0	0.75	0	0					
colleoni gastone						0	4220.764	7490.308	10901.82
collina piero		0	0	0	0	8315.02	4875.528	8634.476	25007
colombo achille	2218.697	2247.766	33898.46	7543.325	9976.117	0	0	0	0
colombo felice	0	0	0	0	16543.53	10091.53			
colombo paolo andrea		0	0	0		0	0	11683.43	12975.53
colombo umberto	34036.62	28032.4	39769.07	75630.25	109354.1	78151.69	38982.15	17167.48	
comana mario	0	0	0	12120	12048	0	0	0	0
comoli maurizio			0	0	0	0	0	0	43769.37
concina enzo			0	10656.73	0	0	0	0	
confalonieri fedele	698.633	1307.682	662.491	473.518	565.288	387.913	827.961	1172.235	0

confortini massimo				0	0	0	0	9221.247	17548.52
consorte giovanni	0	0	0	0	10794.34	41278.17	17501.44	25263.56	
conti fabio massimo					0	0	11336		
conti fulvio	1855.188						0	0	0
coppola di canzano eugenio	11293.33	9076.795	4348.216	0	0				
cordero di montezemolo luca				0	19143	23762.89	16233.32	23352.92	36877.12
cordero di montezemolo matteo							0	0	4398.019
corrias alberto	2700.017	5263.875	0	0					
cossutta dario	3568.532	4106.124	0		0	0	0	0	0
costa giorgio roberto	0	0	0	0	0	0	0	5143.833	9597.783
costa maurizio	0	1307.682	662.491	473.518	565.288	387.913	827.961	1172.235	0
costa nicola	23017.95	19933.17	16076.74	0	0	0	9004.132	10021.18	
cotone pierpaolo				576.748					
cagnotti andrea	0	0	0	2992.507	2855.567	0			
cagnotti elisabetta	8190	7370	2260	0	0				
cagnotti sergio	8190	7370	2260	2992.507	2855.567	0			
cravero alberto	8802.108	0	0						
cremonini vincenzo	0	0	0	0	0	0	0	9822	9882
croff davide	902.236	434.601	0	0	0		12744	0	0
cucchiani enrico				782.112	7494.813	4824.248	3234.758	4139.206	0
cuneo gianfilippo			0	0		3344.722			
dacci nereo	0	0	0	0	0	0	0	724.242	1141.261
d'agui' pietro	0	18	0	0	0	0	0	3209.207	3232.611
dal bo' domenico								0	1
dallochio maurizio	0	0	5.684	9571.229	15231.98	30555.32	31221.33	46017.24	4480.738
daveri giuseppe	2206.041	3074.366	0	834.031	1983.877	902.683	3518.944	4537.149	4559.802
de angelis luigi						726.689	43.335	0	
de benedetti carlo	25716.14	28478.88	35771.77	34556.72	22919.31	28165.69	26183.82	48399.81	7567.824
de benedetti marco edoardo diego	0	3925.543	2453.371	5423.54	5286.962	6396.535	4753.079	5894.781	6517.807
de benedetti rodolfo	3991.687	3696.417	2086.436	910.735	842.021	397.753	11553.32	17025.56	6556.978
de cecco enrico	0	0	0	0	10549	0			
de censi giovanni	8614.303	11339	11432.5	4642.103	5159.767	8555.359	6263.315	20827.66	18164.13
de jaegher jean f	1327.03	2051.825	4065.798	6001.431	2161.493				
de jong jan maarten		0	0	0	4879.551	0	0	0	
de maio adriano				0	1704.189	7564.735	32304.2	28313.56	38054.29
de marco marco								0	34272
de nora niccolo'	2021.392	0							
de simoi sergio			0	1017.017	0	696.839	1383.068	3794.21	4807.191
de stasio vittorio	0	0	2127.368	0	6891.255	6100.981	8148.613	0	
de tilla maurizio			0	19116.73	8812.025	17225.44	17982.55	30251.15	14727.06
de vivo guido	0	0	0	0	0	0	0	16330	10887.43
deaglio mario renzo	1005.988	466.392	672	0	0	0	0	4635.31	3769.632
debenedetti franco	628.064	306.66	310.449	52.924	53.135	60.044	46.241	94.787	19067.31
del ninno giulio	0	0	0	253.172	23177.83	15779.49	11133.33		
del vecchio leonardo	1315.257	2788.043	4692.381	16917.63	1941.479	2334.273	2666.316	2801.153	4253.819
delfini mario	762.867	5.71	32.42	7643.673	8298.189	3056.13	2783.334	3871.817	3896.204
della valle diego	0		0	0	0	1939.02	21082.58	61266.45	56295.85
dematte' claudio						0	7200		
desiata alfonso	8830.063	2767.477	1708.222	988.051	914.372	1539.786	613.534	1181.312	
dettori vincenzo	4687.154	10580.67	0	0	0	0			
devoto gianluigi								79.009	9
dezzani flavio	968.548	721.131	4157.909	3074.309	1434.898	4182.565	3876.457	4567.729	7604.817

discepolo daniele							0		17198.93
domenichini giovanni	0	0	84	0	0	0	0	848.284	0
dona' dalle rose andrea paolo maria	464.529	699.168	1742.21	1333.344	307.559	470.454	2265.944	7077.651	2720.255
doris ennio	0	0	23262.46	63929.04	60541.95	32749.54	27822.79	46693.53	21586.11
dossena giovanna maria	0	0	8142	10612	0	0	0	0	0
dotti bruno	5699.604	3583.232	4259.868						
drago marco	0	0	0		0	0	0	2048.008	0
drago roberto	0	5452.38	5674.264	0	13874.48	7448.854	4757.597	2048.008	
duehrkop klaus	0	0	658.799	0	0	0	0	0	
d'urso carlo	6765.333	17549.65	17639.13	19781.45	27096.33	22031.28	12037.74	20953.87	30848.79
dusi emilio	1100.317	1298.212	674.259	2388.193	2267.738	0			
elkann john philip	0	0	0	0	0	335.167	1004.314	11714.27	14420.82
eramo biagio				8075.639	7978.667	0	0		
erede sergio	93993.7	149080.8	133784.2	68017.09	83417.45	40078.33	29860.9	54373.86	84861.02
ermolli bruno				0	8081.733	387.913	827.961	5785.549	3190.021
fabrizi pier luigi	27544	11441.49	32548.82	80176.91	120046	23576.11	22043.64	29673.34	0
falck alberto	45541.22	40143.07	35271.43	45579.44	31871.52				
falck federico	1312.568	1880.828	5898.093		0	0	17958.52	17476.03	27894.5
faneschi mauro	11804.33	9858.057	14210	15636.48	10549				
fantozzi augusto								2883.857	0
fausti luigi	0	0	0	3259.018	3171.591	4921.08	7778.034	5554.036	18650.65
faverio gian giacomo	0	0				0	43.335		
favrin antonio	0	0	0	1333.344	7896.875	10795.77	7627.232	15443.35	9333.011
ferragamo ferruccio	8406.625	8293.435	27451.9	50178.98	18800				
ferrari riccardo	8628.421	6800.075	0						
ferrari guidoberto		10752	10840	47919	44266.09	2034.768	2178.829	4662.903	2479.094
ferrero cesare	0	0	0	11899.99	15934.72	18732.19	21904.3	13113.01	5493.033
ferrero pierluigi	1136.426	1024.758	1119.632	910.735	842.021	397.753	328.953	918.481	934.789
ferrero pietro	8326.777	11863.57	22068.31	5113.272	0	0	0	4021.814	
ferro luzzi paolo	0	8580.189	0		4709.671		0		
filippi alessandro						0	8514		
fiorani gianpiero		0	0	0	2343.875	6238.986	2379.072		
fois candido	0	3712.167	3233.331	14443.77	14063.36	10901.97	3187.25	0	0
folonari alberto	0	5596.717	8350.263	0	0	0	0	0	0
fontana giuseppe	0	0	0	0	0	3654.088	7715.042	5963.77	14705.71
fontana loris	10318.72	6762.939	4561.4	0	0	0	0		
forestieri giancarlo	0	6735	0	988.051	914.372	1539.786	613.534	1181.312	1403.518
fortis marco			10840	13626	0	0	0	14706	14796
franceschetti ennio	0	0	0	0	18444.4	17196	0	0	0
franceschetti giacomo	2544	36	72	13626					
franchi attilio	3486.736	1503.209	1326.043	2427.877	2025.446	2050.55	1712.608	0	
francione luigi	263.3	186.921							
franco marcello	2461.237	19815	28049.33	0					
fratta pasini carlo	4399.5	6675	3874.469	1995.363	3088.781	4053.171	2075.448	2028.937	4885.923
fresco paolo	579.402	761.713	10148.1	21027.34	30203.24	0	0	0	0
fucile filippo			2260	2992.507	2855.567	0			
gabetti gianluigi	1516.651	5.333	153.938	172.575	154.868	260.485	4909.875	5097.381	13881.2
gagna giorgio	32899.5	24012	7872.995	8838.805	2720.433	0	0		
gajo giovanni		6735	6790			0			
galateri di genola e suniglia gabriele	40115.03	17183.01	14625.9				15268.38	39151.45	31068.95
galli massimiliano				3	7.5				
gallo marcello	0	0	0	0	0	0	0	732.063	712.523

gambaro mauro					25449	25600.38	17428.3	0	0
gamberale vito alfonso		0	0	0	0	0	0	16641.97	
gandini ezio	0	1219.74	1329.645	648.298	4102.2	1868.554	1720.925	0	
garavaglia carlo	0	0	6354.061	7711.469	8396.541	2474.462	3758.163	4432.046	21112.14
garavaglia luca		0	0	10844.58	0	3009.023	1081.774	4437.586	4661.454
garofano giuseppe maria						0	0	1361.557	5789.063
garraffo mario	0	0	0	0	9048	0	0	50053.54	36162.18
garrino gianluigi	1708.206	3723.459	14864	9264.809	15326.94	9649.34	7956.963	0	
garrone alessandro	0	0	0	0	0	0	0	9742.211	2546.961
garrone edoardo	0	0	0	0	0	0	0	0	4519.334
gatti giuseppe		0	0	0	2779.334	14350	14150	5480.516	17671.64
gatto carlo	4833.802	4638.195	1629.815	0	0		0	1035.191	4534.112
gatto giuseppe	0	0	0	0	0	1459.259	2322.407	5837.141	6452.526
gavarone gregorio	0	0		0	180	0	0	0	0
gavazzi roberto	2463.468	12847.83	14487.25	9806.006	0				
gavio beniamino						0	0	6102.712	3263.278
gavio daniela	0	0	0	0	341.193	1268.818	2079.397	1032.711	658.476
gazzoni frascara giuseppe	29371.97	17868.21	7952.905	8878.14	0	0	8350.148	4349.541	0
gera fabio	757.35	3.795	3.204	3.204	2.928	2.611	0	0	0
germano giovanni	763.423	229.369	213.414	150.373	54.811	10.686	44.845	224.44	688.562
geronzi cesare	1438.086	18461.9	26488.73	47908.99	27131.28	1884.105	7284.338	8079.232	8294.323
giacomini francesco			0	0	0	6914.003	6695.351	7823.964	6806.689
giannini giancarlo	1129.796	0							
giarda dino piero				0	16227.17	12610.85	8748.224	58954.59	88647.31
giavazzi francesco	1129.796	2383.659							
giavazzi giovanni	963.762	646.706	76.477	74.272	121.56	33.016	299.719	0	0
gibellini andrea	8404.546	7610.097	9558.053	18560.18	19212	0	0	0	0
giliberti enrico	0	0	0	0	0	27361.69	9841.043	5524.459	9341.342
gilles gramat		2653.88	468.665	0	0				
giordano pietro									2546.961
giordano ugo	0	0	0	0	0	21	4266	4920	4950
giovannini marco								0	972.451
girard franco roberto	6356.422	3696.417	8107.49	10633.71	9220.495	7187.78	6618.807	2433.683	1647.045
girelli giorgio angelo						0	0	0	27812
gnudi piero	10562.16	3578.667	0	6036	21000	32706	21871.43	12271.17	12806.42
gnutti emilio	0	12411.73	26452.74	25527.22	15110.37	33944.9	32826		
gotti tedeschi ettore				0	0	0	12157.39	12931.01	19942.15
grande carlo	0	0		958.46	0	0	0		
grande stevens franzo	19105.05	30784.34	42226.88	62036.42	40405.22	81597.98	66750.5	26659.57	20624.01
grandi paolo	45	60	119	21166	0				
grassini franco alfredo					0	0	0	17209.55	0
graziosi giovanni battista			0	0	0	0	0	0	1646.357
greco mario	0	0	22068.49	44119.95	56671.56	44593.6	59666.06	21398.16	65073.34
griges enrico	0	3365	0						
grilli enzo				13249.92	12802.52	11124.18	9232.132	3312.648	
gros pietro gian maria		0	0	0	0	0	7508.08	51179.82	70473.06
guatri luigi	11639.96	10500.02	10534.63	20587.66	25769.96	24881.79	29001.28	34070.26	31741.9
guerra andrea			0	0	0	0	0	10728.08	9424.936
guerra pietro	0	16080	0						
guidi guidalberto	20275.51	39439.66	1894.497	1017.017	841.693	0	0	16749.36	
guty gianfranco	64041.82	61545.5	38520.22	48115.04	2267.738	8778.006		0	0
imperatori gianfranco	0	2635.656	0	0	0				

innocenzi fabio				0	3088.781	4053.171	2075.448	14389.65	17061.1
iozzo alfonso				3792.5	0	0	0	0	0
irti natale				0	0	7868.604	0		
isabella bruno	9001.777	6003.136	2376.76	0	0	0	6425.701	4610.868	7566.862
jaeger piergiusto	9858.208								
jaquinto roberto		0	19882.17	12271.88	19960.33	4314	4254	21	
jona celesia lamberto	16747.77	16481.82	23242.44	24139.81	16533				
la noce luciano pietro				0		0	0	0	1954.551
la russa vincenzo	0	0	0	0	0	0	0	4757.422	2950.545
lado stefano melchiorre	0	0	0	0	0	0	0	724.242	1141.261
laghi enrico						0	0	0	6579.71
lamberti paolo alberto	0	4141.406	5624.005	10519.76	0				
lamborghini bruno	0	726.15	786.936						
landi luigi	16624.12	19186.73	2393.39	6648.466					
lateri di genola e suniglia gabriele					5379.272	14592.29			
lazzaroni giuseppe			0	7590	6347.278	0	21289.57	2477.741	9882
legnaioli michele							0	3504.696	5688.089
lentati attilio leonardo	8763.955	7112.198		0	0	0	0		0
leoni guido			0	30060	31353	20034	19754	23202.2	19340.83
libonati berardino	6433.646	0	0	45423.34	6365.956	2617.883	0	3244.658	10624.79
lignana giuseppe	2787.869	0					0	0	0
ligresti gioacchino paolo	0	0	0	17503.85	17280.86	96292	11990.79	6027.773	5492.726
ligresti giulia maria	0	0	0	10819.41	6807.585	38214	43003.77	56254.73	73635.03
ligresti jonella	1685.333	142.653	89.126	27094.42	27405.55	35446.57	50945.4	57655.29	38901.68
lina alberto	0	0	0	0		0	0	5476.154	3809.797
lione augusto	752.7								
lo vecchio consolazione lucia lia	0	0	0	151.445	81.078	311.837	408.322	383.558	833.229
lombardi adolfo	737.306	0	0	0					
lombardini siro	8498.043	10678.96	6416.354	17648.57	24047.68	28766.29	17919.03	0	
lonati ettore	0	1344.406	7124.18	0	0				
lonati tiberio						0	0	259.716	256.785
loredan francesco	704.347	1838.98	0	0	0				
lualdi ambrogio						0	0	6605.971	5507.351
lucchini giuseppe	39438.76	18553.04	16247.57	35943.37	38369.15	34654.47	31672.06	11686.53	12154.59
lucchini italo		646.706	76.477	18488.14	3195.1	1101.407	3414.31	5038.674	6270.679
lucchini luigi	14108.11	49119.22	53355.86	0	0				
lucchini marco								0	3757.874
lugli franco				9102	12048	0	0	0	0
luzzati luigi		0	96	14414.3	21048	20082	9599.815	15248.42	16439
macchini gianfranco								13080	
macellari emilio			0	0	0	0	0	1199.49	2941.064
machirelli augusto								0	3772.231
magnocavallo antonio						0	0	11452	9882
magnoni giorgio	0	0	0			9097.645	14137.26	21605.67	3998.666
magnoni pierangelo	0	30.256	767.225	4940.792	0				
majore albino	754.517	2.2	16.85	3881.828	5024.554	1454.483	297.806	780.66	984.614
malguzzi alfredo							0	5408.893	0
malim hugh charles blagden				0	0	0	14150	4761.122	17451.94
mancinelli paolo	6403.042	487.922	433.222	171.329	217.034	55.241	116.453	292.431	0
manes vincenzo	0	8076	0	0	0	0	0	2126.316	2253.77
manfredi manfredo	10128	20055	9830.446	9774.708	6040	0			
mangiagalli marco	0	0	0	958.46	4298.756	4314	4254	21	56



mangoni andrea		0	6280.717	16654.6	12576.63	41202	22544	0	0
manuli mario	0	0	0	6320.984	4729.484	15550.52	0	0	
manzoni armando					0	0		7816.54	0
maramotti achille	2573.676	4195.085	4171.837	56015.06	14010.33	13491.46	11434.63		
maramotti luigi								5855.707	7352.838
maranzana luigi	0	0	3392.5	3792.5	0	3654.088			
marcegaglia emma								7134.738	
marcegaglia steno	3813	4047	4080	4560	4533	0	0	0	0
marchetti piergaetano	0		0	8137.718	8529.266	7964.391	0	2239.281	1596.928
marchi carlo	7657.568	8615.827	8747.78	0	0	0	0	0	0
marchi ferruccio	0	233.735	154.499	0	0	0	0	0	0
marchini alfio	0	0	0	0	0	0	13336.73	13621.91	19698.89
marchio' angelo	15941.16	20888.21	32090.63	5113.272	0	0			
marchionni fausto					0	311.837	408.322	5498.52	4324.034
marchiorello dino	0	15590.55	6342.02	0	0				
mari giuliano				9102	0	0		0	
marinelli luciano		3406.966	4306.364	0	0	0	0	0	0
marino antonio						0	19754	22806	22946
marniga romano		0	0	0	0	4116.555	21961.94	3649.354	0
marocco antonio maria						20790.11	0	0	0
marrone virgilio	8804.701	11882.51	13316.01	15841.1	7583.876	0	0	18020.85	42613.38
martellini maria	0	0	2928.854	7106.689	9182.893	14350	0	0	18062
martinelli felice	0	5758.496	21705.43	36546.89	30462.47	29173.15	31156.71	25872.06	28933.23
martini giandomenico	0	0	45381.76	11567.63	10804.97				
martino luciano		0	17550						
marzotto nicolo'			1742.21	1333.344	307.559	470.454	460.401	0	
marzotto paolo	464.529	699.168	1742.21	1333.344	307.559				
marzotto pietro	40458.36	25700.04	6340.906	11341.71	13538.03	2746.448	0		
marzotto stefano	464.529	699.168	0	0	0	0	0		
marzotto umberto	464.529	699.168	1742.21	0	307.559	470.454	460.401	0	
mascaretti sergio stefano	0	0	0	0	0	0	0	8	8
masera rainer stefano	0	0	3392.5	0	0	3654.088			
masetti maurizio		55	44						
masini giovanni	24	24							
mattera massimo			0	0	30370.42	11300.67	0	0	0
mauri mario					0	0	0	15392.05	9245.928
mazzi carlo						0	4220.764		
mazzola gianni						1073.25	1885.333	2182.667	
mazzoleni mario	0	0	0	12773.83	15475.68	0	0	0	0
mazzotta roberto			0	0	0	0	7403.275	7885.659	15614.83
mazzotti stefano	0	1146.892	0			0	0	0	
mei enzo						0	0	15423.42	12389.51
meloni stefano	0	0	4125.284	0	0	0	0	0	6596
meomartini alberto	7608	3365	8142	0	0			0	0
merle christian	0	2653.88	468.665	0					
merloni vittorio	0	0	0	0	0	0	0	0	9967.75
messina alfredo	1845.488	2880.135	3517.118	4379.713	4381.898	2349.58	927.446	1687.706	1557.169
micciche' gaetano	0	0	0	0	23520.66	9182.539	0		
micheli francesco	34242.52	20381.6	22986.7	3847.03	2741.501	0	0	0	
mignoli ariberto	9049.676	3764.459	0	0	0				
milanello angelo						2595.547	1170.898	0	
milanese tommaso vincenzo	11040.06	10580.67	0	0	0				

milla alberto	3849.9	6514.717	3471.788	5468.159	1681.588	1981.035	1414.811	2886.862	0
mincato vittorio	0	0	0	0	0	0	0	9556.062	6755.753
minelli giovanni	737.306	0	0	0	0	0	0	0	0
minguzzi italo giorgio	0	0	72	72	12048	0	0	0	0
minozzi romano	0	0	0	9.333	9.333	0	0	0	0
minucci aldo	0	2607.123	12712.46	15018.18	12759.79	15036.11	9668.265	17456.07	31488.21
mion gianni	11708.87	16094.68	7011.108	63983.19	70764.25	48460.98	56663.8	31072.6	39543.11
modiano pietro				0	21000	20034			
molinari amato luigi	18533.5	29734.26	7124.467	30332.1	36442.55	52416.11	50696.54	52171.34	48550.98
molinari sandro	15290.27	13492.98	0	0					
moltrasio andrea									6217.48
mondadori forneron leonardo	1415.406	6735	7925.551	4524.672					
monferino paolo	263.3	186.921							
montani piero luigi			0	0	0	0	0	5058.604	0
montevocchi walter	0	3.795	3.204	482.245	224.191	1248.678	0	0	0
monti ernesto				0	31353	23590.43	28105.92	12191.7	42754.66
monti riffereser maria luisa	150.819	199.965	305.566	104.926	110.29	142.136	91.564	163.154	1648
montini gianbattista bosco	1441.562	0	0	0	0	0	0	0	0
montipo' fulvio	0	0	0	0	0	0	0	5242.464	0
morat claudio						1073.25	1885.333	2182.667	0
moratti massimo	19446.31	11943.02	3115.551	8895.309	6540.405	3727.984	2507.263	3056.65	14238.06
morazzoni gaetano					0	0	20327.45	14318.33	13947.75
morbidelli giuseppe			0	0	0	26671.83	21258.25	11487.26	18327.71
morchio giuseppe	0	0	0	0	0	7677.291			
moriani diva					0	0	0	2126.316	2253.77
moscato guglielmo	0			0	2212.02	2580.129	4047.381	0	9882
mugnaioni alessandro				0	0	2	0		
nale franco	0	0	0	1995.363	0				
nardozi giangiaco	0	0	0	0	0	3928.422	2729.33	4197.993	0
nattino giampietro	6279.713	13445.78	0	33858.48	39624.55	15910.03	14658.24	7876.427	14996.49
nefri nicolo'	23258	56180.27	40800.44	0		0			
negri clementi gianfranco				0	4882.101	4572.052	4167.586	7746.295	0
nicodano umberto carlo maria		761.031	10178.47	0	6040	5764	11336	0	0
nicolo' giuseppe	0	0	7584.809	5384.875	3659.644	3388.365	3129.095	3636.91	0
notarbartolo di villarosa roberto	0	0	119.756	381.819	1902.869	11896.64	16717.66	14397.44	12939.36
noto alffio			18724.69	5149.002	0	0	0	0	12293.87
nottola antonio	27751.09	32715.82	28129.97	27542.85	21420.37	0			
novarese andrea							33787.71	42661.68	32751.66
oldoini giorgio	0	0					0	3951.543	2233.96
olmo giorgio				0	0	0	0	332.204	0
orlandi sergio	8869	10752	9492	10612	10549	10066	9926	11452	11522
orlando luigi	23979.12	4621.77	3967.078	8520.791	6622.839	2825.887	0		
orlando rosolino	0	0	0	0	0	0	43.335		
orlando salvatore jr	0	120.374	194.143	390.449	487.761	726.689	1661.137	6708.039	808.126
ottolenghi emilio	0	0	6055.479	10642.81	11244.54	0	0	0	0
ovi alessandro	10570.91			0	0	1509.583	2815.444	15504.64	17544.33
pacchioni piermaria	6228.488	2627.464	5674.473	0	0				
pagani carlo						1073.25	0		
pagliaro renato	7595.149	4476.627	3540.252	11258.37	0	0	5512.461	3900.729	5225.886
palandri enrico				0			195		0
palazzani giampietro	0	0	0	0	2864.799	3396.103	3373.229	4843.38	0
palenzona fabrizio		0	0	3238.451	3403.881	0	6806.893	22777.07	3855.271

palma angelo maria							6263.315	1640.159	1270.385
palmeri aldo						2			
paolillo ernesto						0	0	34062	
paolucci umberto							0	13080	13160
papa franco carlo			0	0	0	0	0	0	16430
paravicini crespi luca	1128.728	0	0	0	0	0	0	0	10897.86
parazzini enrico				13626	700.536	962.295	0	0	0
pasqua valter							0	0	1270.385
passera corrado			0	0	23599.39	3928.422	2729.33	4197.993	6625.283
pasti francesco	4399.5	6675	3874.469	1995.363	0	0	0		
paveri fontana luca	5632.648	0			0	0	0	0	0
pavesi carlo	0	11934.81	7829.216	10248.12	8656.394	10683.39	7140.489	0	
pavesio carlo		0	0	0	0	18616	14150	1754.06	1273.306
pecci alberto	16693.08	33727.11	32585.17	35161.32	4481.934	2785.85	2844.006	15314.98	26207.35
pedersoli alessandro	0	0	0	0	0	24696.88	21738.79	16224.65	13184.79
pelliccioli lorenzo	0	22670.69	856.667					2048.008	0
peretti carlo	0	0	10840	12120	0	7305.241	14150	20592.27	14173.05
perissich riccardo	0	0	0	3262.761	700.536	0	0	0	0
perissinotto giovanni		0	0	4930.302	13399	33840.71	41718.39	54613.69	78911.78
perolari giorgio	23534.6	23579.17	6719.818	10476.63	1072.714	559.041	600.392	1237.139	1804.455
perricone antonio									10930.51
pesenti carlo	4465.424	25271.52	41634.43	35332.79	71619.16	42212.78	52904.91	57786.69	55373.97
pesenti giampiero	48589.09	42853.52	22575.61	26297.39	19725.45	20741.83	37736.99	56314.34	40680.73
petroni mario	28773	0	0						
philippe jaques emile georges	43673.75	33197.09	7457.354						
piaggio giuseppe			0	0	0	0	0	0	10757.29
piantini ferruccio			5179.598	19446.33	0		0	0	0
piaser alberto			0	249.332	215.936	35.136	49.144	187.345	2087.416
piccinini marco	0	0	0	0	0	0	0	0	6588.682
pini massimo					0	27652.93	16451.5	5498.52	25540.24
pininfarina andrea	6955.285	6351.441	7250.486	5700.79	19561.2	428.193	14560.46	9973.443	4713.815
pininfarina sergio	8633.113	6667.366	672	0	16653.55	4106.17	3385.935	0	
pino salvatore			0	0	2720.433	0	0		
piol elserino								23433.34	7904.114
pirelli alberto	19529.61	489.465	2240.283	22475.02	18934.43	6125.539	6847.791	18408.71	29772.85
pirelli leopoldo	94.755								
pistorio pasquale							5011.104	7329.277	5459.462
pittatore gianfranco				0	0	10368.19	10055.53	7761.257	7353.859
pizzini flavio	15970.73	0	0	0	0	0			
poli roberto	0	0	0	0	2339.105	4050.756	8248.892	7032.27	1964.524
poma giuseppe	0	0	16946.24	0	0				
pompei giancarlo				0	341.193	0			
pontello silvano	0	4305.875	2465.524	3632.781					
pontolillo vincenzo				0	0	0	3124.807	6194.751	12844.3
ponzanelli giulio				0	3926.695	2414.238	0	0	0
ponzellini massimo								10504.08	
porcari carlo						9850.376	7352.135	15601.55	31516.22
pozzoli guido					0	0	0	724.242	1141.261
prato maurizio	0	0	20220	11257.5	11235				
preda stefano	9603.724	7107.399	0						
presutti ennio	17536.12	21235.21	0	0	0	0	0		
profumo alessandro stefano m	7419.87	7598.379	8024.564	10685.9	3403.881	3501.692	2594.619	2663.599	3855.271

prosperetti luigi	0	0	0	15786.96	0	0			
puca vincenzo			0	8075.639	7978.667	0	0		
puri negri carlo alessandro	47562.43	40660.26	471.984	22454.85	28889.29	29293.17	21905.97	30880.85	24495.4
quadrani ettore	0	0	0	2309.804	2610.971	12924			
quadrino umberto				31551.58	31377.62	10170.69	14377.52	28469.62	0
querci carlo	2935.333	443.057	4718	5024.48	6020	0	0	0	0
racugno gabriele				0	0	0	0	3472.258	3268.673
rampinelli rota pierfrancesco	10865.31	0	0	0	0	0	0	0	0
rامل Dieter									3855.271
randazzo francesco					0	0	0	0	12903.88
rangoni machiavelli claudio	4399.5	6675	3874.469	1995.363	3088.781	4053.171	2075.448	2028.937	4885.923
rastelli pietro	5080	5392	5436	6076	6040				
ratti mario	34888	17511.08	8943.135	19852.99	15184.69	0	0	0	0
ravanelli fabio		0	0	0	0	0	0	8190	8240
razzano dante		0	0	0	0	0	1394.388	1805.155	5226.019
reboa marco	0	10752	29848.9	25282.43	34979.42	37828.15	30478.99	26425.02	25495.91
recchi claudio	7099.306	7812.67	8963.286	0	2774.119	1725	1632.535	2203.597	4413.09
recchi giuseppe					0	2228.023	0	0	0
repetto flavio				9060.279					0
resca mario				0	2339.105	4050.756	8248.892	7032.27	1964.524
reviglio franco			0	0	0	7114.274	8772.343	0	
rho ermanno	0	0	2664.085	2497.335	3999.599	4787.005	3626.267	3933.521	5990.026
riccardi guido			0	0	0	0	0	6556	32
riffeser andrea leopoldo	150.819	199.965	305.566	104.926	110.29	142.136	91.564	163.154	1648
righetti luigi	0	0	0	5384.875	3659.644	3388.365	3129.095	3636.91	0
rinaldini carlo	5	4	4	3	7.5	2			1
rinaldini giuseppe	5	4	4	3	0	0			
rinaldini guido	0	0	0	3					
ripa di meana vittorio	7277.431	3982.118	18675.23	20363.11	66140.51	2116.671	5008.316	6813.748	0
rispoli vittorio							0	0	4133.11
rizzo roberto	0	0	0	0	0	0	132	0	0
roascio roberto			0	0	7978.667	25686	14150	0	
robotti roberto							38.111	222.68	348
rocca gianfelice	83777.39	34795.79	37718.95	38727.53	48304.17	32040.57	46235.07	59166.61	59031.6
rocca paolo riccardo	0	0	0	0	0	105.406	38.111	222.68	348
romiti maurizio	11422.26	10366	10562.63	4386.521	8297.149	13155.98	0	0	
romiti pier giorgio		1219.74	13544.1	17280.3	4102.2	1868.554	1720.925	1035.191	0
rondelli lucio	13132.27	17515.59	20936.06	1640.365	4248.997	0	0	12157.84	25288.12
ronzo errico							0	12333.68	0
rosa umberto	8689.49	8068.442	0	0	9841.875	25686	17071.5	12570.08	20148.16
rosiello piera	1897.553	726.15	786.936						
rosina alcide ezio	7608	10752	9492	12120	168	2436.656	0	0	5120.374
rossetti mario							0	13839.14	20727.7
rossi roberto						24234.95	18356	17996.19	0
roth luigi	0	0					0	14131.25	4181.307
roverato paolo							0	7539.172	20116.57
roversi fabio alberto		0	0	8764.845	0	10970.47	12383.92	32409.8	48523.33
rucellai cosimo	0	0	0	0	0	311.837	408.322	383.558	833.229
ruffolo ugo	0	0	0	0	0	0	0	1181.312	8151.678
ruggiero riccardo					0	0	0	6042.339	2695.466
ruozi roberto	26034.42	38783.2	26831.04	19509.71	34897.63	21372.22	28188.85	42299.92	38859.66
russo salvatore	10128	0	0	0	0	0	0	0	0

saa' marzio								0	4980.148
sabatini paolo	17988.81	62273.07	6765.645	9750.298	9048	8634	0		
sabelli rocco					0	3944.101	9926	0	0
sacchetti ivano	0	31911.41	37344.27	5112.667	5465.817	3156.366	1750.186	3906.948	
sacchi alberto	0	0	0	0	341.193	1268.818	2079.397	11853.8	6876.484
salvati sandro	2140.501	619.887	844.979	988.051	914.372	1539.786	613.534	0	
salvatori carlo	0	2653.88	0		3403.881	8347.83	6983.253	7884.982	0
salvemini severino			0	0	0	0	0	13080	13160
sangalli gian carlo		0	0	9584.423	0	0			
santa maria alberto	13935.06	12239.74	9994.353	15590.96	13366.48	0	0	0	
saracco claudio				0	0	273.767	158.642	534.934	0
sardo salvatore	5513.488	5918.23	1506.256	0	0		0	0	0
sassi stefano									2720.255
savio pierpaolo	0	4				2			
saviotti pierfrancesco	23427.65		9999.992	48871.77	57024.07	23003.21	18295.39	15018.49	23400.81
savona paolo		8099.189	48426.52	16956.59	11745.82	8629.532	22195.57		0
scaroni paolo	0	0	8612.611	10612	12048	0	9422.903	0	0
scarsi pio				0	8017.963	7243.936	8160.372	9110.366	0
scherger albert							43.335	0	
schettino michele	10199.81	5409.496	0	0					
schmitz franz	1288.621	0	0	0					
sciume' paolo	22109.45	26692.64	19107.28	15543.15	17147.53	17465.68	9926	6169.507	12188.16
sclavi antonio	0	3019.706	4019.472	0	0				
scotti luigi	40953	0	0						
secchi carlo			0	0	0		0	35113.97	38044.63
segre dario federico	0	0	0	0	307.559	470.454	460.401	39225.65	33695.51
segre massimo	8869	939.64	2738.548	4562.875	4076.62	5214.844	6226.726	18930.23	24204.08
sella maurizio	0	0	5138.004	10545.46	0	0	0	2224.745	0
sensi francesco			5216.985	0	0	0	0	0	0
serafino vittorio	10998.77		0	0		0	0	9464.88	2978.308
seragnoli giorgio	5136.347	14482.75	4897.681	0	0	0	0	0	
severgnini oreste	4909.052	1196.883	4183.535	2400.582	10855.69	3039.4	2989.784	3508.867	0
siagri roberto								0	13160
sibani leone	0	0	0	0	0	14350	6620.916	2649.376	9882
siglienti sergio	5507.95	29969.22							
simonetto gianfranco					0	25	144	117	0
sozzani vincenzo	28958.96	16611.5	9127.758	21379.51	30159.55	17423.56	18923.8	5417.229	
spadafora giuseppe			0	0	0	0	0	7009.262	12419.49
spalla franco	0	0	0	35	42	8634	8514	5186.15	6597.268
spinelli francesco			0	0	49.761	0	0	0	
spiniello salvatore						0	0	4757.422	2950.545
spoglianti agostino			0	4384.761	5183.948	0	0	0	0
sposito claudio	3258.216	7608.613	9682.39	10143.36	6133.776	0	0		
stefana mauro	20128	0	0	0	0	0	0	0	0
stefanel giuseppe	6154.757	0	0	2012.635	1839.915	0	0	3061.136	0
stefanini pierluigi				0	0	0	0	0	6439.092
storer silvano	369.235	424.756	1258.343	0	12048				
strazzera livio					2357.582	842.162	0	0	0
strutz eric				0	0	0	3018.977	3792.152	0
superti furga ferdinando					0	1459.259	2322.407	9460.928	0
tabellini mauro	0	0	0	9.333	9.333	20	20	8	8
taddei franco	5080	5392	7616	859.413	0	5764	0	0	0

tagliavini giuliano					0	2915.271	2459.551	0	
talarico antonio	12640	13420	14872	5481.56	5914.616	13859.39	408.322	5498.52	4324.034
tamburi carlo			0	20359.5	11235				
tamburi giovanni			0	0	0	0	3950.417	9761.584	41725.87
tamburini matteo		6735	20296.35	12038.13	13729.84	20493.6	32116.93	49714.09	51249.96
tanzi calisto	8579.905	24249.74	8392.769	15117.75	13280.56				
taormina antonio					9048	2348.718	2587.51	0	0
taranto francesco			0	0	0	24276	23936	4844.901	32468.31
tazartes alberto	21010.01	24729.69	39463.8	0	0	16183.89	5417.143		
tazartes antonio	3568.532	4106.124	0		0	0	0	6127.978	
tazzetti alberto						0	3863.939	12948.22	29430
teodorani fabbri pio	26.349	5.333	153.938	10784.58	8167.988	7116.71	6815.734	13214.88	23214.97
terrenghi vittorio	0	4458.391	3890.685	0	0	0	0	0	0
tesone antonio	15715.35	29822.59	32865.3	8793.681	6570.6	0	0	0	0
todisco franco						0	2805.392	9406.539	4372.192
tondato da ruos gianmario						0	0	5094.892	36648.9
torchia luisa									6330.141
toti pierluigi		0	0	0	4726.638	0	0	0	0
tracanello umberto	753.988	761.818	2648.392	4970.875	16713.42	21259.38	15848.87	0	0
trapani francesco	0	0	0	0	9048	8634	8514	0	0
trombi gino	4996.626	2864.716	3399.34	5551.352	3622.859	2730.088	2983.802	5537.022	8309.609
tronchetti provera marco	24305.35	46847.92	34099.73	104042.6	21633.11	9942.373	8712.946	13225.81	14008.75
tunioli roberto						0	0	22783.28	6514.589
turchetti manfredo								10	
uckmar victor	14013.35	7916.559	5733.135	7198.276	5625.151	0	0	0	0
ugo renato	0	0	0	0	0	7224.063	8197.361	10616.53	11628.28
vagnone paolo								13130.83	12515.63
valdani enrico							0	32.135	
valerio stefano								14706	14796
valle silvano	6828	0	0						
valori giancarlo elia	7766.52	0	0	0					
vanoli carlo	478.47	291.415					0	0	
varaldo riccardo						0	0	16330	27626.31
vecchio virgilio	478.47	291.415							
vella francesco									14032.15
vender giovanni jody	5578.406	5476.592	4464.442	10234.37	8995.055	5519.98	6089.921	14985.28	13463.49
vento fulvio		0	16990.07	43488.88	48012.58		0		
vercelli alessandro	0	3019.706	4019.472	0	0				
vesce francesco	0	0	0	0	0	6.667	6.667	0	
vicari salvatore					0	0	0	0	8240
vicari vincenzo						378.53			
vigni antonio				18132	18024	0			
villa roberto							2		
visentini gustavo	1244.335						0	13080	14796
vita giuseppe			0	0	0	12469.9	9286.023	22509.92	
vitale marco	17640	22695	31405.95	60272.25	83896.25	72945.02	40721.83	30043.66	36850.59
vitali giacomo	145.5	0	0	0	0				
volpi nicola						0	0	0	3757.874
volta romano			0	0	0	0	0	17952	14796
von ruedorffer axel freiherr	0	6198.397	4366.575	3463.322	8349.954	0			
vullo gaetano maria pietro	0	0	0	0	110.29				
weiss fritz ulrich	11968.34	10553.06	12218.26	15130	13545	14350	11690.91	13237.64	3192.487

winteler daniel john					1131.743	2145.922	1030.004	1495.581	0
worms gerard etienne	708.642	1535.545	4020.665	0	0	0	0	0	0
zaleski romain camille	0			0	0	7272.737	6737.707	2913.345	4628.43
zanetti emilio	48430.3	6075.062	22842.59	28863.52	9241.755	866.609	2990.148	3048.046	3563.198
zanguio mauro					0	0	146	0	0
zanni umberto	19518.67	18341.41	18566.87	0	0	0	0	0	0
zannoni oscar	0	0	0	36217.03	6040	16596.46	22901.54	23842.15	6596
zanon di valgiurata lucio igino	11341.39	8357.083	9098.133	6495.586	7657.72	5288.831	6118.11	15816.37	11364.37
zanone poma mario				0	0	0	0	0	4950
zanotto giorgio	4399.5								
zucchi manlio	487.305	458.349	3499.293	0	0	0	0	0	
zuccoli giuliano	0	9415	9492	6504.588	6198.839	6355.794	3794.482	13759.84	12296.82
zunino luigi	0	0	7616	859.413	0	1459.259	2322.407	0	0