# BOARD COMPOSITION AND INTERLOCKING DIRECTORATE EVOLUTION AS A CONSEQUENCE OF THE RECENT FINANCIAL CRISIS: EVIDENCE FROM ITALIAN LISTED COMPANIES

***Mauro Romano*, Christian Favino*****

**Abstract**

The recent systemic crisis that has affected the financial markets and real economies of major industrialized countries has had significant effects on the corporate governance and key organizational choices of large firms.
In this context, the present study aims to verify whether the international crisis has significantly changed the structure of the interlocking directorate network that links large firms in the regulated Italian market. To this end, the first part of the paper presents an analysis of the evolution of corporate governance in the main European regulated markets through a comparative analysis of some synthetic statistical data observed at the end of the years 2006, 2008 and 2010. In the second part, after framing the concept of interlocking directorate in a theoretical perspective, we examine the evolution of the network of personal ties between large Italian listed companies in the period of observation (2006-2010) using Social Network Analysis.

**Keywords:** Interlocking Directorates, Social Network Analysis, Financial Crisis, Corporate Governance Evolution, Board of Directors, Corporate Networks

**Department of Economics, University of Foggia, Italy*
***Corresponding Author, Department of Economics, University of Foggia, Via Caggese n. 1, 71121 Foggia, Italy*
*Tel: (+39) 0881.781728*
*Fax: (+39) 0881.573116*
*Email: christian.favino@unifg.it*

Although the paper is the result of the shared research of the authors, sections 1, 3 and 6 are attributable to M. Romano and sections 2, 4 and 5 to C. Favino.

## 1. Introduction

In the recent past, international literature has often focused on the nature and scope of the systemic crisis that has affected the financial markets and real economies of major industrialized countries since the second half of 2008. The changed economic environment, which is still characterized by a high degree of instability and uncertainty, has had a significant impact on corporate results and, in many cases, has also had relevant repercussions on the evolution of corporate governance, on the composition of governing bodies and, more generally, on the main organizational choices of firms.

The aspects most analysed in this context, especially in international literature, include the potential effects of the crisis on both the evolution and the intensity of personal relations that directly and indirectly exist between large firms.

Ties of a personal nature established between companies that share one or more board directors is a phenomenon - also known as interlocking directorate – that is present in all areas of international business, but is particularly widespread in Europe and especially in the Italian market, where large firms often belong to corporate groups structured in pyramid form. To be noted is that major Italian companies, including those listed in the regulated market, are often owned of a small number of family firm groups; consequently, unlike companies in other geographical contexts, they are characterized by cross-shareholding relationships and share common directors. Authoritative literature considers this a relevant factor distinguishing Italian firms that warrants further examination and discussion as this affects the governance structure, the related decision-making capacity of enterprises and, more generally, business performance.

Despite the significant number of interlocked companies, national literature has paid scarce attention to this issue. Although more recent studies have shown growing interest in analysing the causes of the formation of personal ties between companies, and the consequences of this phenomenon on business

results, at the domestic level no studies have focused on the repercussions of the crisis on the structure of the network and the higher (or lower) intensity of the phenomenon in question.

The present work intends to contribute to the theoretical debate by examining the effects of the crisis on the structure of interlocking directorates that link major companies listed on the Italian regulated market.

The first part of the research examines the most significant changes in the composition of governing bodies of listed companies operating in the main European regulated markets and purposes a comparative analysis of some synthetic statistical data observed at the end of the years 2006, 2008 and 2010.

The second part, specifically dedicated to the theme of personal ties between companies, first frames the concept of interlocking directorate in a theoretic perspective by systematically examining the main authoritative contributions in literature.

Subsequently, we examine the effects of the financial crisis on changes in the interlocking directorate network in large Italian listed companies. Applying the Social Network Analysis technique, we compare the main synthetic indicators suggested by literature (density, betweenness, closeness, etc.) that enable examining the evolution of the network in the aforementioned observation period (2006, 2008 and 2010).

The concluding section offers some brief observations that also include insights on the possible future developments of this research.

## 2. The composition of the governing bodies of companies listed on EU regulated markets in 2006-2010

Prior to the description and analysis of the network of interpersonal ties between companies operating in Italy, it seems appropriate to provide some data on the composition and evolution over time of the governing bodies of companies listed on the main regulated markets.

This premise is crucial to frame the interlocking phenomenon as part of the broader issue concerning the evolution of corporate governance mechanisms in the European context following the systemic crisis that occurred in the second half of 2008.

The analyses described in this section first aim to highlight the differences in the corporate governance structure of companies operating in the main European regulated markets: these differences, referring to board composition and the specific characteristics of directors (in terms of nationality, gender, independence, etc.), suggest that the interlocking phenomenon has specific characteristics depending on the territorial context in which it is observed. In this perspective, numerous studies have previously identified, for example, the significant differences between the interlocking directorate networks in Italy, France and Germany (notwithstanding their particular characteristics showing a high degree of density and duplication of interlocks) compared to those observed in the United Kingdom and the United States (more extensive but less dense) (Comet and Pizarro, 2011; Windolf and Beyer, 1996; Windolf, 2002; Santella *et al.*, 2008).

The analyses are also intended to provide information on the evolution of the governance of European firms in the period 2006-2010 to verify, albeit indicatively, whether the effects of the 2008 international crisis - still ongoing - have led to significant changes in the composition of the governing bodies of the companies surveyed.

Moving onto the data analysis[19], to be first noted is that while the number of directors that constitute the boards of companies operating in the main European markets ranges from 12.80 (year 2006) to 12.10 (year 2010), considerable differences emerge in some national contexts (see table 1).

Particularly significant is the case of German companies where the average number of directors (over 17 units), although lower than in 2006 (-10 %), remains the highest when compared with other European countries such as the Netherlands where the average number of directors stood below the threshold of 9 units.

The comparison of the data for the period 2006-2010 also captures differences in evolutionary terms between the different national contexts: countries with more numerous governing bodies showed a downward trend in the number of components (particularly Germany and Italy) while the UK and Switzerland showed an increase in board size, particularly in the Anglo-Saxon context, where the average number of directors in 2006, equal to 8.30, increased in 2010 to 12.4 (approximately + 49.4%).

In dynamic terms, both these trends could be viewed as a consequence of the 2008 crisis, taking into account, in this sense, that board size depends on many variables that lead to alternately favouring more or less extensive governing bodies (Coles *et al.*, 2008).

On the one hand, the need to accelerate the decision-making process and simultaneously contain administration costs may have led the first group of companies (those with a larger board) to reduce the

[19] The data examined in this section are the result of a re-elaboration of the information in the European Corporate Governance Report published every two years by Heidrick & Struggles International (www.heidrick.com). These reports provide detailed information on companies listed on the main European regulated markets: Austria (ATX), Belgium (BEL 20), Denmark (C20), Finland (OMX Helsinki), France (CAC40), Germany (DAX30) Italy (S & P MIB), Netherlands (AEX), Norway (OBX), Poland (WSE), Portugal (PSI20), Spain (IBEX35), Sweden (OMX Stockholm), Switzerland (SMI) and the United Kingdom (top 50 of the FTSE).

number of board directors. On this point, literature has repeatedly shown that numerically restricted boards are more effective than those that are excessively large (Lipton and Lorsch, 1992; Yermack, 1996; Eisenberg *et al.*, 1998).

Conversely, in companies with smaller boards, the crisis may have determined the need to increase the number of directors in order to acquire knowledge (Dalton *et al*., 1999) and new interpersonal skills (Booth and Deli, 1996), which could prove essential in effectively addressing the crisis according to what some authors postulate in the resource dependence theory perspective (Pfeffer, 1972; Pfeffer and Salancik, 1978).

**Table 1.** Average number of directors per board

| Country | 2006 | 2008 | 2010 | Δ 2008-2010 | Δ 2006-2010 |
|---|---|---|---|---|---|
| Netherlands | 8.6 | 8.9 | 8.7 | *-2.2%* | *1.2%* |
| Switzerland | 9.8 | 10.5 | 10.4 | *-1.0%* | *6.1%* |
| Sweden | 10.8 | 10.8 | 10.7 | *-0.9%* | *-0.9%* |
| United Kingdom | 8.3 | 8.5 | 12.4 | *45.9%* | *49.4%* |
| Belgium | 12.9 | 12.7 | 13.8 | *8.7%* | *7.0%* |
| Italy | 15.5 | 13.4 | 13.9 | *3.7%* | *-10.3%* |
| France | 14.3 | 14.6 | 14.2 | *-2.7%* | *-0.7%* |
| Spain | 14.7 | 14.3 | 14.3 | *0.0%* | *-2.7%* |
| Portugal | 14.1 | 13. | 15.2 | *16.9%* | *7.8%* |
| Germany | 19.1 | 17.7 | 17.1 | *-3.4%* | *-10.5%* |
| European average | 12.8 | 11.8 | 12.10 | *2.5%* | *-5.5%* |

Table 2 instead summarizes the age of directors: the European average in 2010, although showing a slight decrease compared to 2006, is around the 58-year threshold. The moderately high level of the average age of board members corroborates the largely unanimous studies that consider director seniority (and related experience) as a positive factor to improve corporate performance and to avoid the risk of business failure (Platt and Platt, 2012). The slight decrease (-1.2%) in the average European age in the period 2006-2010, although in contrast with expectations based on the theories formulated in literature, may be justified on the grounds of a possible regeneration of the board of directors with the entry of younger directors in the aftermath of the crisis. The choice of a partial generational renewal of the board is supported in studies according to which the presence of younger directors ensures the greater efficiency and effectiveness of the decision-making process, a greater propensity towards changes in the business model, in response to changes in the context of reference, and the improved ability to plan future strategies (Houle, 1990; Taylor, 1975; Waelchli and Zeller, 2013).

Also in this case, significant differences emerge between countries with respect to more restricted levels of seniority (in Sweden, for example, the average value is 55.5 years) and those with an average age that systematically exceeds the threshold of 62 years.

**Table 2.** Average age of board directors

| Country | 2006 | 2008 | 2010 | Δ 2008-2010 | Δ 2006-2010 |
|---|---|---|---|---|---|
| Sweden | 57.1 | 57.1 | 55.5 | *-2.8%* | *-2.8%* |
| Portugal | 55.8 | 55.9 | 57.3 | *2.5%* | *2.7%* |
| Belgium | 58.9 | 57.6 | 57.8 | *0.3%* | *-1.9%* |
| Germany | 58.7 | 60.1 | 57.8 | *-3.8%* | *-1.5%* |
| United Kingdom | 58.8 | 59.7 | 58.0 | *-2.8%* | *-1.4%* |
| Italy | 58.2 | 59.6 | 59.8 | *0.3%* | *2.7%* |
| Spain | 56.6 | 58.9 | 59.8 | *1.5%* | *5.7%* |
| Switzerland | 59.3 | 59.5 | 60.2 | *1.2%* | *1.5%* |
| France | 60.8 | 61.6 | 60.4 | *-1.9%* | *-0.7%* |
| Netherlands | 62.9 | 62.4 | 62.4 | *0.0%* | *-0.8%* |
| | | | | | |
| European average | 59.1 | 59.00 | 58.40 | *-1%* | *-1.2%* |

In continuing the analysis, it is also useful to examine the composition of boards of directors in terms of the different nationalities of their members with respect to the country in which the registered office of each company examined is located. We find a significant difference among the countries observed: in some cases (the UK, the Netherlands and Switzerland), the percentage of foreign directors is over 40% and significantly above the European average. This circumstance, according to literature (van Veen and Elbertsen, 2008; MacLean *et al.*, 2006), is influenced by the characteristics (ownership structure, corporate governance systems adopted, etc.) that distinguish the firms operating in each country examined.

In a dynamic perspective, a general increase of foreign members on European boards (except exclusively Portugal) was recorded in the period 2006-2010 with an increase of the European average from 18% (year 2006) to 24% (year 2010). This trend can first be explained by the ongoing globalization of business activities and financial markets. Consequently, in view of the ongoing international crisis, companies need to establish new relationships in territorial contexts that go beyond the local to take advantage of the possibility of extending their markets of reference (Luo, 2005; Andersen, 1993; Sanders and Carpenter, 1998).

Not to be underestimated is that the growing number of foreign directors may also be linked, in some cases, to the need to create greater governance control over the management of foreign subsidiaries, requiring the appointment of trusted directors, in accordance with the authoritative opinion of Mizruchi (1996) who interprets interlocking directorate as a management control and coordination tool.

**Table 3.** Percentage of non-national directors on the board

| Country | 2006 | 2008 | 2010 | Δ 2008-2010 | Δ 2006-2010 |
|---|---|---|---|---|---|
| Spain | 7.6% | 10% | 10% | *0.0%* | *31.6%* |
| Germany | 7.3% | 8% | 11% | *37.5%* | *50.7%* |
| Italy | 7.9% | 11% | 12% | *9.1%* | *51.9%* |
| Portugal | 22% | 21% | 17% | *-19%* | *-22.7%* |
| France | 20% | 26% | 27% | *3.8%* | *35%* |
| Sweden | 15.8% | 21% | 31% | *47.6%* | *96.2%* |
| Belgium | 25% | 36% | 34% | *-5.6%* | *36%* |
| United Kingdom | 31% | 41% | 40% | *-2.4%* | *29%* |
| Netherlands | 36% | 54% | 47% | *-13%* | *30.6%* |
| Switzerland | 45% | 45% | 53% | *17.8%* | *17.8%* |
| | | | | | |
| European average | 18% | 23% | 24% | *4.3%* | *33.3%* |

Another useful factor to examine is gender equality on the boards of large firms: in this case, albeit within the generalized condition of a lack of female directors on the boards of major listed companies, significant differences emerge in the European context. The percentage of women on boards of directors in some countries exceeds 10% (with the remarkable example of Sweden, which stands at around 30%) as opposed to other countries where the female constituent does not exceed the share of 5% (Italy and Portugal).

As regards the temporal profile, we observe a gradual increase in the number of women in governing bodies, with an average European value that went from 8.4% in 2006 to 12% in 2010 (+ 42.9%). This increase can be reasonably attributed to the increasing focus of companies (and the world economy in general) on gender equality, in adherence to recent empirical evidence emphasizing the positive effects of a greater number of women in terms of decision-making efficiency and management control ability (Huse *et al*., 2009; Nielsen and Huse, 2010a, 2010b).

**Table 4.** Proportion of woman on the board

| Country | 2006 | 2008 | 2010 | Δ 2008-2010 | Δ 2006-2010 |
|---|---|---|---|---|---|
| Italy | 2.3% | 3% | 3% | *0.0%* | *30.4%* |
| Portugal | 0.7% | 3% | 4% | *33.3%* | *471.4%* |
| Belgium | 5.3% | 8% | 8% | *0.0%* | *50.9%* |
| Spain | 3.1% | 6% | 9% | *50%* | *190.3%* |
| France | 7.5% | 8% | 11% | *37.5%* | *46.7%* |
| Switzerland | 7.2% | 9% | 11% | *22.2%* | *52.8%* |
| United Kingdom | 15.2% | 15% | 12% | *-20%* | *-21.1%* |
| Germany | 12.4% | 11% | 13% | *18.2%* | *4.8%* |
| Netherlands | 9.0% | 13% | 15% | *15.4%* | *66.7%* |
| Sweden | 21.3% | 22% | 29% | *31.8%* | *36.2%* |
| | | | | | |
| European average | 8.4% | 10% | 12% | *20.0%* | *42.9%* |

Finally, two additional data should be mentioned: the presence of independent directors on the board and the frequency of meetings of the governing bodies.

The first data shows that the presence of independent directors on the boards of European companies was 43% in 2010, a significant decrease when compared to the 54% in 2006. This trend seems to be anomalous considering that in the context of an international market crisis one would expect an increase in the number of independent directors to strengthen governance control over the actions of executive directors. Also to be considered, as indicated by some contributions in literature (Erkens *et al.*, 2012), albeit limited to financial firms, is that the presence of independent directors determines a greater ability to acquire venture capital, which is essential in ensuring the adequacy of capital and to reduce the risk of insolvency during times of crisis.

The data in question could be interpreted by recalling those studies according to which in times of crisis, and therefore following a period of poor performance, the number of insider directors temporarily increases in preparation for the replacement/succession of the CEO (Hermalin and Weisbach, 1988). The trend reverses once a new CEO has been appointed, entailing other executive directors exiting and replacing these with new and often independent directors. However, it is somewhat evident that the study in question, although providing a possible explanation as evidenced by the data examined, reflects the peculiarity of having been tested in a market (the U.S.) that significantly differs from that in which European companies operate.

Alternatively, the reduction of independent directors could be seen as the consequence of an increasing degree of uncertainty inherent in companies in crisis that induces independent directors to abandon their appointment, also to safeguard their reputation and reduce the risk of any liability related to the potential failure of the company (Arthaud-Day *et al.*, 2006; Fahlenbrach *et al.*, 2010; Finklestein *et al.*, 2009; Withers *et al*., 2012).

Also to be noted is that the percentage of independent directors varies considerably in the different national contexts examined: it assumes high values in the Netherlands (75%), Switzerland (62%) and the United Kingdom (61%), and is significantly more limited in Germany (21%), Portugal (30%), Belgium (32%) and Spain (36%) (data for 2010).

**Table 5.** Percentage of independent directors on the board

| Country | 2006 | 2008 | 2010 | Δ 2008-2010 | Δ 2006-2010 |
|---|---|---|---|---|---|
| Germany | 28% | 30% | 21% | *-30%* | *-25%* |
| Portugal | 35% | 22% | 30% | *36.4%* | *-14.3%* |
| Belgium | 41% | 40% | 32% | *-20%* | *-22%* |
| Spain | 40% | 30% | 33% | *10%* | *-17.5%* |
| Austria | 23% | 28% | 36% | *28.6%* | *56.5%* |
| France | 51% | 42% | 40% | *-4.8%* | *-21.6%* |
| Sweden | 42% | 45% | 40% | *-11.1%* | *-4.8%* |
| Italy | 52% | 45% | 48% | *6.7%* | *-7.7%* |
| United Kingdom | 91% | 86% | 61% | *-29.1%* | *-33%* |
| Switzerland | 75% | 63% | 62% | *-1.6%* | *-17.3%* |
| Netherlands | 85% | 79% | 75% | *-5.1%* | *-11.8%* |
| | | | | | |
| European average | 54% | 45% | 43% | *-4.4%* | *-20.4%* |

The often-recalled increasing level of uncertainty due to the crisis also allows explaining the general increase in the number of directors' meetings in the period examined. At the European level, an increase of 8% of meetings is shown in the 2006-2010 period; this increase is even more evident when comparing the 2006 figures with those of 2008, when the crisis manifested with greater intensity, imposing the frequent convening of governing bodies to take decisions to effectively deal with the changing international economic and financial situation. The evidence provided confirms Jensen's (1993) postulation, namely, an increase in the number of meetings of the board of directors is a reaction to negative results. In the same vein, also to be considered is the effect of an increase in the number of meetings that, according to some authors, exerts positive effects in terms of improved performance in the years following the increase in the frequency of meetings (Vafeas, 1999).

Except for the German context, where the number of meetings was nonetheless extremely low in the three years under observation (always below the threshold of 6 meetings per year), in other countries the data is essentially in line with the European average (9.40), ranging from the minimum value recorded in Belgium (8.0) to the highest value found in Italy (11.30) (data for 2010).

**Table 6.** Frequency of board meetings (average number of meetings per year)

| Country | 2006 | 2008 | 2010 | Δ 2008-2010 | Δ 2006-2010 |
|---|---|---|---|---|---|
| Germany | 4.4 | 5.8 | 5.9 | *1.7%* | *34.1%* |
| Belgium | 8.9 | 8.6 | 8.0 | *-7.0%* | *-10.1%* |
| Netherlands | 8.1 | 9.3 | 8.3 | *-10.8%* | *2.5%* |
| Switzerland | 7.3 | 8.2 | 8.4 | *2.4%* | *15.1%* |
| Portugal | 8.7 | 10.6 | 8.9 | *-16.0%* | *2.3%* |
| France | 7.4 | 8.1 | 9.0 | *11.1%* | *21.6%* |
| United Kingdom | 8.7 | 9.6 | 9.4 | *-2.1%* | *8.0%* |
| Sweden | 9.4 | 10.9 | 10.3 | *-5.5%* | *9.6%* |
| Spain | 10.9 | 11.4 | 10.9 | *-4.4%* | *0.0%* |
| Italy | 12 | 12.1 | 11.3 | *-6.6%* | *-5.8%* |
| | | | | | |
| European average | 8.7 | 9.60 | 9.40 | *-2.1%* | *8.0%* |

## 3. Literature review

Interlocking directorate is a widespread and extremely varied phenomenon in the international economic reality: its complexity is the subject of constant interest in literature examining the different sociological, organizational, managerial and legal profiles.

This implies that any attempt at classifying the numerous scientific papers is considerably difficult when taking into account the different objectives and the specific aspects under study.

The systematic analysis of the literature, conducted as part of this research, suggests that the authoritative contributions in literature can be usefully classified according to the following analysis objectives:

A. Examine the motivations and environmental factors that foster the creation of interpersonal networks, together with the analysis – also in evolutionary and comparative terms – of the structure of networks in different international contexts.
B. Analyse the consequences on corporate behaviour of sharing one or more directors, the functioning of the governance system and corporate performance.
C. Assess the personal impact of interlocking on directors with multiple appointments (increase of remuneration, acquisition of new skills, growing reputation, etc.).
D. Investigate possible causal links between intense personal ties between companies in a given sector and the possible limitation (or alteration) of competition in the relevant markets.

In the first line of research (point A), some studies focus on the critical analysis of the reasons (so-called models) that justify the creation and dissemination of interlocks between large firms (Fennema and Schijf, 1979; Koening *et al*., 1979; Zajac, 1988; Mizruchi, 1996).

In this context, particularly significant are some works that systematically examine the models and theories advanced by literature to explain the development and evolution of the personal nature of relationships between legally distinct firms.

In particular, Koening *et al*.'s (1979) contribution argues that the spread of networks based on common directors alternatively expresses one of the following circumstances:

a) management control power (*management control model*) that is able to guide the votes of shareholders at the time of the appointment or replacement of members of the board of directors (Dahl *et al.*, 1959; Cheit, 1964; Dively, 1972; Holden *et al.*, 1941)
b) the need to build mutual cooperation relations between firms (*reciprocity model*) by sharing directors (Dooley, 1969; Allen, 1974)
c) the volition of financial institutions to exercise control over debtor firms (*finance control model*) (Aaronovitch, 1961; Perlo, 1957)
d) the presence of an elite group of influential people (*class hegemony model*) who share common objectives and through their simultaneous presence in large firms can ensure the maximization of personal profit and more stable control power (Domhoff, 1967; Mills, 1956; Zeitlin, 1974).

In a later work, Mizruchi (1996) describes six separate models that justify the formation of personal ties:

a) the collusion model, according to which the diffusion of interlocks has origin in the desire of firms to create useful ties to exchange information, coordinate decisions within an industry and limit competition (Pennings, 1980; Burt, 1983)
b) the cooptation and monitoring model, according to which interlocking directorate is an instrument adopted by firms to secure the resources needed to reduce environmental uncertainty or monitor the behaviour of companies entrusted with their resources (consider the bank-firm relationship) (Dooley, 1969; Pfeffer, 1972; Allen, 1974; Pfeffer and Salancik, 1978; Schoorman *et al.*, 1981)
c) the legitimacy model, which considers the sharing of directors as a result of firms seeking to legitimize their value to investors through the creation of a series of personal ties with other entities (DiMaggio and Powell, 1983)
d) the career advancement model, whereby the creation of the interlocking directorate derives not so much from companies seeking to create ties with other entities, but from directors seeking an increasing number of more important appointments, and firms seeking directors with more experience, irrespective of the entities they are linked to (Stokman *et al.*, 1988; Zajac, 1988; Useem, 1979; Mace, 1971)
e) the social cohesion model, according to which interlocks are the result of ties between members of the richer and more influential social classes that tend to perpetuate their power through the mutual exchange of appointments (Mills, 1956; Mace, 1971; Domhoff, 1967; Zeitlin, 1974).

The aforementioned research stream also includes many studies that examine the structure of interlocking networks by measuring the density of ties, the number and the centrality of the different parties involved, their evolution over time and the different network characteristics according to the geographic context under observation.

The contributions in this area focus in some cases on a single country (or industry sector) and refer to a specific date (Everard and Henry, 2002; Comet and Pizarro, 2011; Gambini *et al.*, 2012), while others, although focused within a limited geographical context, examine the evolution over time of firm networks (Heemskerk, 2007). Finally, additional studies propose analyses comparing the interlocking directorate networks in different countries (Windolf and Beyer, 1996; Santella *et al.*, 2008; van Veen and Kratzer, 2011) or examine the evolution of the network of personal ties between companies operating in distinct nations (international network) (Carroll *et al*., 2010; Heemskerk, 2013).

The second stream (point B) includes studies, referring to the aforementioned theoretical models (particularly that of cooptation and monitoring), that aim to measure the effects of interlocking on decision-making, on the effectiveness of governance mechanisms and on value creation. In relation to the latter point, the extreme variety of empirical results is noteworthy and based thereon the literature has affirmed that interlocking positively (Phan *et al*., 2003; Elouaer Mrizak, 2009; Silva *et al.*, 2006; Di Pietra *et al*., 2008; Li *et al.*, 2013) or negatively (Non and Franses, 2007; Croci and Grassi, 2010; Drago *et al.*, 2011) affects firm performance and business value. Remaining on the theme of performance, the study of Khanna and Thomas (2009) demonstrates a possible synchrony of results between companies linked by interlocking directorate.

Another part of literature instead focuses on particular circumstances that indirectly affect firm performance and business value.

First, we recall the studies that indicate a weakening of control mechanisms due to the excessive number of multiple appointments undertaken by interlocked directors who, with limited time and resources, often fail to effectively fulfil their duties of control over the actions of executive directors (Beasley, 1996; Fich and Shivdasani, 2006). Falling into this category are also studies that demonstrate that interlocks are negatively related to persistence and balance sheet value relevance (Arena, 2012).

In addition, according to some authors, interlocking directorate also has repercussions on the management of extraordinary (or non-recurring) operations. According to Stuart and Yim (2010), for example, listed companies with interlocked directors are more likely to be acquired by private equity firms. However, other authors have pointed out that the attitudes of firms facing a takeover attempt are varyingly affected by the intensity and type of ties that exist between the acquiring firm and the target entity (D'Aveni and Kesner, 1993).

Beyond the firm perspective, the interlocking directorate phenomenon is also shown to have significant effects in the personal sphere of shared directors (studies included in point C).

According to Fich and White (2005), for example, the reciprocal sharing of CEOs among different enterprises is an instrument that primarily promotes the pursuit of the private interests of those involved, rather than as a governance mechanism for the benefit of the firms. With this in mind, the empirical evidence reported by Hallock (1997) is unsurprising, according to which the sharing of directors determines a significant increase in the remuneration of interlocked directors.

It is quite evident that the benefits enjoyed by directors who participate in interpersonal networks between companies are not exclusively limited to the economic aspect. Some authors have thus focused on the relative stability of the interlocking directorate network, attempting to investigate the factors that enable some directors to permanently occupy several different positions on the boards of large firms. In this sphere, we recall the aforementioned studies according to which, on one hand, this implies a gradual reduction of the density of the interlocking network in individual European contexts with a simultaneous dissolution of the director elite shared at national level (Heemskerk, 2007); on the other hand, implying the rapid spread of interpersonal ties between companies operating in different European countries, which enables identifying a new elite of more influential and internationally active directors (Carroll *et al.*, 2010; van Veen and Elbertsen, 2008; Heemskerk, 2013).

Finally, the proposed classification model includes studies that have sought to examine the theme of sharing directors in terms of the proper functioning of markets (point D perspective). Indeed, the primary source of interest on the interlocking theme historically originates in the legislative measures taken in the United States (first and foremost the Clayton Act) to limit the phenomenon of common directors among competitor firms and to discourage the adoption of collusive behaviours. This line of research, although of primary importance, has recorded limited results in terms of empirical evidence due to the extreme difficulty of proving (in statistical terms) the causal link between interlocking and market concentration.

The studies of Pennings (1980) and Burt (1983), while empirically demonstrating a relationship between the degree of market concentration and the presence of interlocking directors, were unable to verify the existence of a causal link between the two observed phenomena. In subsequent years, literature proposed some insights (Santella *et al.*, 2008; Windolf and Beyer, 1996) that through the analysis of network characteristics (density, multiple ties between companies, etc.) outlined two main interlocking directorate models. On one side, those of a cooperative nature (present, for example, in Germany, Italy and France), which due to their structure induce hypothesizing agreements and collusion between firms; on the other hand, those of a competitive nature (observable in the British context) where the limited presence of interlocks between firms and the characteristics of the associated entities appear to respond better to the paradigm, based on resource dependence theory, which qualifies personal ties as a means of acquiring and sharing resources essential to the survival and development of the enterprises involved.

## 4. Theoretical framework and explanation of the research aims

According to the literature review proposed in the previous section, the present research is ideally

positioning within the framework of studies that aim to examine the interlocking network structure from an evolutionary perspective in a given geographical context.

Compared to the studies carried out in recent years, our study has some noteworthy distinctions.

We previously mentioned that some authors have in the recent past proposed a comparative analysis of the structure of networks in Italy, Germany and the UK, although capturing their essential characteristics in only a single period that coincides with the beginning of 2008 (Santella *et al.*, 2008). Other studies, while offering more complex and in-depth analyses of the evolution of the national network in the period 1998-2006, do not allow verifying whether the recent international crisis of 2008 has somehow changed the structure of the interlocking directorate network in the context of Italian listed companies. The results of the analysis conducted by Santella *et al.* (2008) describe a relatively dense interlocking network among Italian listed companies (especially in the blue chip segment), dominated in large part by an elite of directors relating, in many cases, to a small number of family controlled groups (industrial or financial).

With this in mind, our study intends to verify, from an evolutionary perspective, whether the 2006-2010 period saw significant changes in the density of ties within the overall network structure and to measure the centrality of the most influential companies in the sample examined. Hence, building on co-optation and control theory (Mizruchi, 1996), we intend to specifically examine whether the need to address the 2008 international crisis and the consequent desire to reduce environmental uncertainty in subsequent years (Schoorman *et al.*, 1981) contributed to a significant increase in the density of ties and a possible change in the degree of centrality of some enterprises, with respect to those generally observed, to create new alliances and consequently share distinctive competencies and resources (Dooley, 1969; Pfeffer, 1972; Allen, 1974; Pfeffer and Salancik, 1978).

## 5. The evolution of the network based on sharing directors between large Italian listed companies in 2006-2010

### *5.1. The data and the methodology adopted*

To construct the database used in this research, reference was made to listed companies in the FTSE MIB segment of the Italian Stock Exchange in the years 2006, 2008 and 2010. From the original sample – composed of forty companies for each year of observation – we excluded two entities under foreign law: STMicroelectrics and Tenaris[20].

The choice of the overall time period examined (2006-2010) is closely linked to the purpose of our study, namely, to investigate whether the sudden spread of the systemic crisis that has recently affected the world's leading economies (including Italy) has had a significant impact on the structure of personal ties between major Italian listed companies.

The further methodological choice to perform the analysis on a biennial (2006, 2008 and 2010) rather than annual basis, is aimed at facilitating the next phase of discussing and interpreting the results obtained, enabling focusing on three distinct periods each characterized by different economic and market conditions (i.e., the apparent stability of the economy in 2006, the emergence of the financial crisis in 2008, the consolidation of the conditions of instability and uncertainty in 2010).

The study of interpersonal ties among firms in the sample was conducted by examining the composition of their governing bodies – the board of directors when adopting a traditional or monistic governance model and the management board when adopting a two-tier model – as resulting on 31 December of each year (2006, 2008 and 2010) in the summary documents published periodically by Consob (Italian Securities and Exchange Commission).

The in-depth analyses foreseen in this research were implemented through identifying changes in key indicators used in literature in the Social Network Analysis framework (Wellman and Berkowitz, 1988; Wasserman and Faust, 1994; Freeman, 2004; Carrington *et al.*, 2005; Scott, 2013). We thus examined, also in evolutionary terms, the level of cohesion of the network (density, geodesic distance), the degree of centrality of the network as a whole and from the perspective of firms that are more involved in personal network relations (Freeman's degree, closeness, betweenness). In addition to the calculation of the key synthetic network indicators, we also graphically represent the network in order to highlight, in a more immediate and direct way, the main changes that occurred in the period under investigation[21].

[20] The list of companies that constitute the survey sample of this research is given in Appendix A.

[21] The Ucinet software was used to calculate the key synthetic network indicators (Borgatti *et al.*, 2002); the graphic representation of the network was implemented with the correlated Netdraw visualization software.

**Table 7.** Distribution of multiple directorship in Italian listed company network

| N. of directorship held by 1 person | 2006 | % | 2008 | % | 2010 | % |
|---|---|---|---|---|---|---|
| **1** | 402 | 86.83% | 371 | 86.28% | 359 | 85.48% |
| **2** | 48 | 10.37% | 44 | 10.23% | 53 | 12.62% |
| **3** | 7 | 1.51% | 11 | 2.56% | 6 | 1.43% |
| **4** | 5 | 1.08% | 4 | 0.93% | 2 | 0.48% |
| **5** | 1 | 0.22% | - | - | - | - |
| **N. of directors** | **463** | | **430** | | **420** | |
| **N. of directorship** | **544** | | **508** | | **491** | |

From the operational point of view, the network of ties between companies was analyzed by first creating the so-called affiliation matrix composed of *n* columns (events) representing the firms in the sample (38 firms) and *m* rows (actors) corresponding to the respective directors in office at the end of each year observed[22].

Table 7 shows that the number of directors present in the 38 companies examined decreased from 463 (FY 2006) to 420 units (FY 2010); a significant number of these directors held multiple positions in the companies observed, up to a maximum five positions in 2006 (1 case), four positions in 2008 (4 cases) and 2010 (2 cases).

The matrix (*m x n*) resulting from the intersection of these two perspectives (affiliation matrix) was subsequently re-elaborated to generate the symmetric matrix $n \times n$, which summarizes the presence of common directors between the observed firms (adjacency matrix). All indicators subject to comment in the next section thus refer to the aforementioned adjacency matrix (*n x n*) of the 38 listed Italian companies that make up our research sample[23].

### *5.2. Results and discussion*

Table 8 illustrates the key data describing the network of personal ties between large Italian listed companies (FTSE MIB) and presents an immediate view of the evolutionary trends of the interlocking directorate at the national level between 2006 and 2010.

First to be noted is that the first component of the network (i.e., the larger subgroup) increased in size from 30 units in 2006 to 34 units of 2010; conversely, in the same period, the number of ties significantly reduced from 73 to 61 (- 16.4%).

The reduction of the number of ties between companies is reflected in the network density, which particularly decreased in the period 2008-2010, shifting from the value of 0.1038 to 0.0868 (- about 20%). The increase of companies in the first component and the reduced number of interlocks in relation to 2010 renders the network structure less dense than in 2006, resulting in an increase of the geodesic distance between enterprises: compared to an average distance of 2.4 nodes in 2006 and 2008, the corresponding value in 2010 is 2.8 nodes[24].

The companies examined are in many cases linked by sharing several directors, with the result that the number of common directors among the entities varies from one to five. The years 2006 and 2010 show, for example, cases of companies linked by five common directors: in 2006, this is observable in the context of ties between Alleanza Assicurazioni and Banca Intesa, while in 2010, the greatest sharing of directors is between Exor and FIAT. Finally, in 2008, the most intense ties, with four directors in common, are observable in the relationship between Mediaset and Mondadori (Table 9).

We hereafter focus on the measures of network centrality (Freeman, 1979), both as a whole and with reference to individual companies, to describe the evolution of the network and the different roles played by firms in the period examined.

[22] The combination of *m* columns and *n* rows originated three separate affiliation matrices (2006, 2008 and 2010) for a total of 49,932 items.

[23] The adjacency matrix initially obtained from the re-elaboration of the affiliation matrix was dichotomized as suggested by literature for the calculation of specific indicators (Prell, 2012). Thus, in some cases, regardless of the number of shared directors between firms (one, or more than one) the correlated value in the matrix examined was given an equal unitary value (presence or absence of the tie).

[24] In terms of reticular cohesion indicators, the density corresponds to the ratio between the number of ties actually existing in the network and the number of all ties potentially achievable. The geodesic distance instead represents the shortest distance (in terms of paths) between a pair of nodes: in this research, we examine the average geodesic distances between all nodes of the first component, taking into account that an increase in this indicator (greater distance between firms) corresponds to a decrease in the density of the reticular structure.

**Table 8.** Descriptive statistics of the network of Italian listed companies

| | 2006 | 2008 | 2010 |
|---|---|---|---|
| Number of companies observed | 38 | 38 | 38 |
| First Component | 30 | 32 | 34 |
| Components (minimum 2 linked nodes) | 3 | 1 | 1 |
| Isolated | 4 | 6 | 4 |
| Number of ties | 73 | 76 | 61 |
| Density | 0.1038 | 0.1081 | 0.0868 |
| Geodesic Distance (average distance) | 2.4 | 2.4 | 2.8 |

**Table 9.** Distribution of interlocks (based on number of directors in common)

| N. of directors in common | 2006 | % | 2008 | % | 2010 | % |
|---|---|---|---|---|---|---|
| 1 | 51 | 69.9% | 58 | 76.3% | 49 | 80.3% |
| 2 | 11 | 15.1% | 12 | 15.8% | 5 | 8.2% |
| 3 | 9 | 12.3% | 5 | 6.6% | 5 | 8.2% |
| 4 | 1 | 1.4% | 1 | 1.3% | 1 | 1.6% |
| 5 | 1 | 1.4% | - | - | 1 | 1.6% |

**Table 10.** Centrality measures of the network of Italian listed companies

| | 2006 | 2008 | 2010 |
|---|---|---|---|
| Degree of centralization (Freeman's degree) | 28.98% | 28.53% | 25.08% |
| Centralization closeness (main component) | 41.60% | 39.51% | 35.40% |

Table 10 shows a moderately high degree of hierarchy in the network (based on the value of Freeman's degree) throughout the period of observation, which means that, within the network, some companies have a more active role due to the higher number of direct ties with other firms. Examining the development of the centrality indicators from a dynamic perspective, we observe a reduction in the degree of hierarchy in the network: both the Freeman's degree of the whole sample observed and the average closeness indicator in relation to the first component decreased by more than 10% in the period 2008-2010[25]. These changes, although significant, indicate that in the years following the crisis, the network had a less centralized structure.

Turning to the measures of centrality of individual companies in the sample[26], we note that the

[25] The centrality indicators of the entire network (in some cases, referring to the first component) summarize the average degree of centrality assumed by each actor with respect to the remaining companies in the network and thus provide information on the network hierarchy. With this in mind, these indicators range between 0 and 1 (where not expressed as a percentage) and take values close to zero when a consistent degree of centrality exist among companies; to the contrary, when one or several companies focus the majority of their ties to a greater extent when compared to other companies, the observed indicator tends to converge towards the unitary value (Wasserman and Faust, 1994).

[26] With reference to the key centrality indicators measured in this research and referring to individual companies in the sample, the following should be clarified.
The *Freeman's degree* is the simplest and most immediate measure of centrality: it corresponds to the number of nodes (companies) with which another node is directly linked. The higher the number of direct ties, the more advantageous the company's position can be considered, while its role within the network can be considered the most central and active. Other centrality indicators (based, however, on indirect ties between companies) are closeness and betweenness. *Closeness* is the summary indicator of the proximity of a node with respect to all the others and in numerical terms corresponds to the inverse of the sum of the entire geodetic distance between a node and all the others (Sabidussi, 1966). *Betweenness* instead measures the number of paths that pass through a given node: in this perspective, a company assumes a central role as an intermediary between other nodes to the extent that it contributes to fostering indirect ties between non-adjacent firms. In this way, the firm acts as an intermediary between other businesses, able to control the exchange of information within the network (Freeman, 1977).

most relevant nodes (represented by Pirelli, Mediobanca and Autostrade/Atlantia) maintained their top position in the network during the entire period observed. Nevertheless, in accordance with that previously mentioned in reference to the network as a whole, the number of direct ties between the more centralized firms (expressed by Freeman's degree) significantly decreased especially in the period 2008-2010. Interesting to note in this context, by way of example, is that that while in 2008 the number of companies linked with at least ten other companies is equal to four (Pirelli, Mediobanca, Atlantia and Telecom Italy), in 2010, this is only found in two cases (Pirelli and Mediobanca). More generally, the number of nodes (companies) that have at least five direct ties decreased between 2006 and 2010 from 14 to 11 cases.

The reduction in the total number of direct ties within the network has a positive effect on the intermediating role played by some companies that on closer inspection acquire, in the observed period, a more important position within the network as measured in terms of *betweenness*. In essence, with fewer direct ties within the network, increasing importance is assumed by those companies that also play the role of intermediaries (so-called gatekeepers) between other businesses that are not directly linked, channelling the exchange of information and resources.

In this context, comparing for each year the list of companies with higher centrality indicators (expressed in terms of *Freeman's degree* and *betweenness*), we observe that their composition, although similar, differs with respect to certain companies. This in essence implies that some companies, despite having a lower number of direct ties than others (*Freeman's degree*), take on greater strategic importance within the network since as a gatekeepers they link - albeit indirectly - other companies that are not adjacent.

In a dynamic perspective, beyond the previously mentioned reduction in the number of direct ties (*degree*) and the correlated increase in the degree of importance of intermediation of some firms (*betweenness*), a general reduction was also observed (between 2006 and 2010) in the proximity (*closeness*) between companies. This reflects on the form and structure of the network, which as already mentioned is less dense and more extensive in 2010 than in 2006.

In further investigating the role and positioning of the companies examined, we observe that the majority of these have direct ties with other companies that play a strategic role within the network. This further amplifies the network cohesion effects and the centralization of coordination power in relation to a small group of firms and leads to the formation of numerous cliques[27] of significant size (more than four units).

Again we note, in a dynamic perspective, that the crisis of 2008 appears to have reduced the number of cliques in the timeframe examined: those equal to four units were halved between 2008 and 2010 (from 10 to 5), those with five units were present only in 2006 (2 cases) and in 2008 (3 cases). Of all companies with direct ties with other companies of higher centrality, the hegemonic role of Pirelli is noteworthy, which is present in all larger cliques in each year (those with five for 2006 and 2008, those with four for 2010).

In general terms, it can reasonably be argued that centrality summarizes the ability of firms to take an active role in the network, resulting from power of control over the flow of information and resources that are exchanged between directly related or mediated companies.

[27] The term clique refers to the subset of highly cohesive nodes within which each node has direct ties with the other members of the clique; it follows that within cliques the geodetic distances between all nodes are always equal to 1.
Herewith follows the composition of larger cliques identified in the years of observation:
year 2006 (2 cliques of five units): 1) Autogrill, Autostrade, Mediobanca, Pirelli, Telecom Italia; 2) Alleanza Assicurazione, Banca Intesa, Generali Assicurazioni, Mediobanca, Pirelli
year 2008 (3 cliques of five units): 1) Atlantia, Autogrill, Mediobanca, Pirelli, Telecom Italia; 2) Alleanza Assicurazioni, Generali Assicurazioni, Mediobanca, Pirelli, Telecom Italia; 3) Alleanza Assicurazioni, Generali Assicurazioni, Intesa San Paolo, Pirelli, Telecom Italia
year 2010 (5 cliques of four units): 1) Italcementi, Mediaset, Mediobanca, Pirelli; 2) Atlantia, Italcementi, Mediobanca, Pirelli; 3) Italcementi, Mediobanca, Pirelli, Unicredit; 4) Atlantia, Autogrill, Mediobanca, Pirelli; 5) Italcementi, Mediaset, Parmalat, Pirelli.

**Table 11.** Centrality measures (*Freeman's degree*) of Italian listed companies (companies with a Freeman's degree above 5)

| Company | 2006 | Company | 2008 | Company | 2010 |
|---|---|---|---|---|---|
| Pirelli | 14 | Pirelli | 14 | Pirelli | 12 |
| Mediobanca | 13 | Mediobanca | 12 | Mediobanca | 11 |
| Autostrade | 9 | Atlantia | 11 | Atlantia | 8 |
| Autogrill | 8 | Telecom Italia | 10 | Luxottica | 8 |
| Telecom Italia | 8 | Generali | 9 | Italcementi | 8 |
| Capitalia | 6 | Italcementi | 8 | Generali | 7 |
| Italcementi | 6 | Mediaset | 7 | Autogrill | 6 |
| Mediaset | 6 | Luxottica | 7 | Mediaset | 6 |
| Generali | 5 | Alleanza | 7 | Parmalat | 6 |
| Banc. Pop. Un. | 5 | Autogrill | 7 | Fiat | 5 |
| Alleanza | 5 | Parmalat | 6 | Eni | 5 |
| Fiat | 5 | Fiat | 5 | | |
| Parmalat | 5 | Eni | 5 | | |
| Luxottica | 5 | Intesa | 5 | | |
| | | Unicredit | 5 | | |

**Table 12.** Centrality measures (normalized betweenness) of Italian listed companies (top ten centralized companies)

| Company | 2006 | Company | 2008 | Company | 2010 |
|---|---|---|---|---|---|
| Pirelli | 17.596 | Pirelli | 16.109 | Pirelli | 21.078 |
| Mediobanca | 13.438 | Atlantia | 14.079 | Mediobanca | 16.532 |
| Autogrill | 10.849 | Generali | 12.504 | Generali | 15.234 |
| Autostrade | 8.159 | Mediobanca | 11.579 | Luxottica | 15.018 |
| Telecom | 5.089 | Luxottica | 7.256 | Parmalat | 12.947 |
| Fiat | 4.871 | Italcementi | 6.009 | Fiat | 11.299 |
| Fondiaria-Sai | 4.334 | Telecom | 5.094 | Atlantia | 11.162 |
| Unicredito | 4.327 | Autogrill | 4.773 | Telecom | 8.213 |
| L'Espresso | 4.204 | Unicredit | 4.580 | Italcementi | 7.596 |
| Parmalat | 3.442 | M.P.S. | 4.505 | Tod's | 6.269 |

**Table 13.** Centrality measures (normalized closeness) of Italian listed companies (top ten centralized companies)

| Company | 2006 | Company | 2008 | Company | 2010 |
|---|---|---|---|---|---|
| Pirelli | 63.043 | Pirelli | 62.000 | Pirelli | 54.098 |
| Mediobanca | 61.702 | Mediobanca | 59.615 | Mediobanca | 52.381 |
| Autostrada | 54.717 | Telecom | 56.364 | Generali | 47.826 |
| Telecom | 53.704 | Atlantia | 55.357 | Parmalat | 47.143 |
| Autogrill | 52.727 | Generali | 52.542 | Italcementi | 46.479 |
| Italcementi | 49.153 | Italcementi | 50.820 | Atlantia | 46.479 |
| Parmalat | 49.153 | Autogrill | 50.000 | Luxottica | 44.595 |
| Mediaset | 47.541 | Luxottica | 48.438 | Autogrill | 44.000 |
| Capitalia | 45.313 | Alleanza | 48.438 | Mediaset | 42.857 |
| Fondiaria-Sai | 44.615 | Parmalat | 48.438 | Eni | 42.308 |

**Table 14.** Cliques in the Italian listed company network

| Minimum set size | 2006 | 2008 | 2010 |
|---|---|---|---|
| **4** | 7 | 10 | 5 |
| **5** | 2 | 3 | 0 |

The graphic representation of the network, obtained using the Netdraw software, allows visually perceiving the evolution of the network structure that, as already mentioned, is progressively less dense and more extensive in its meshes.

Beyond the positioning of individual companies, amongst which the central role of Pirelli is also graphically evident, it is interesting to note the increasing number of cut-off points (represented with triangles) that increased by less than 5 units (6 to 11)

from 2006 to 2010. This refers to those particular nodes whose eventual removal would result in the exclusion of one or more firms from the first component and, for this reason, are particularly significant in the network. The increase in cut-off points could be explained by the reduction in the total number of ties between the firms observed (recalling that direct ties decreased from 73 in 2006 to 61 in 2010). In this context, each tie takes on increasing importance and its absence is likely to interrupt the chain of indirect ties in the network.

In graphic terms, the reduction of direct ties is also reflected in the structure of the network, which as mentioned, in the comparison between 2006 and 2010, is more extensive and less dense towards the centre.

**Figure 1.** Interlocking directorship network among Italian listed companies in the FTSE MIB (year 2006)

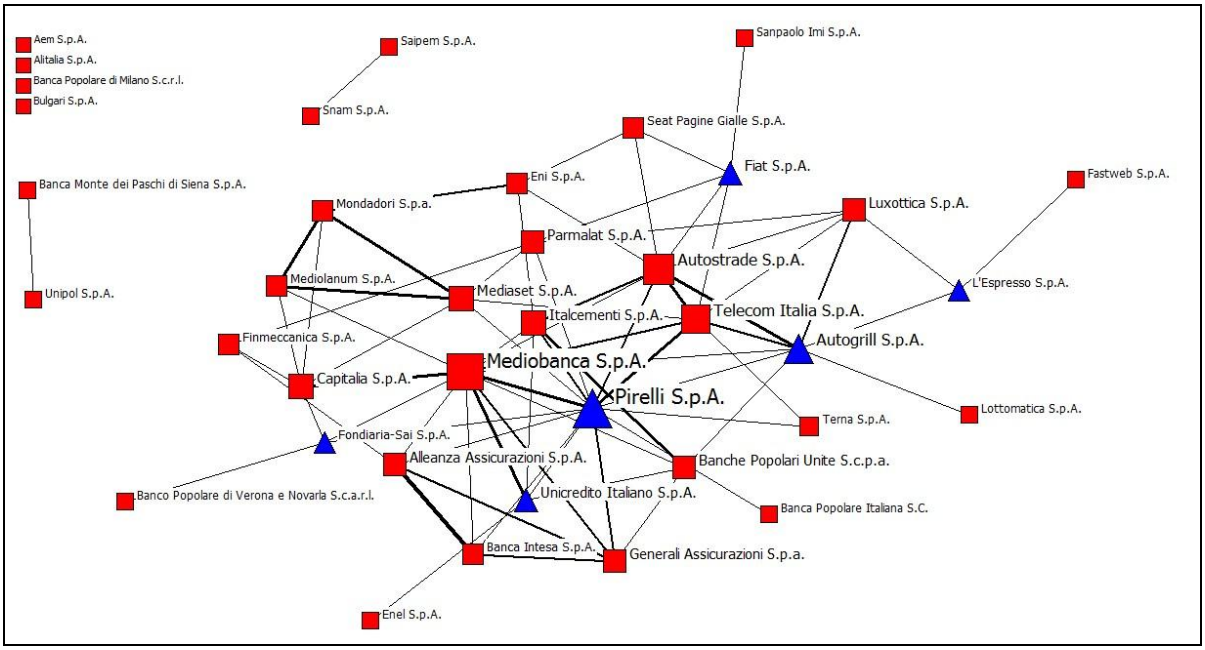



**Figure 2.** Interlocking directorship network among Italian listed companies in the FTSE MIB (year 2008)

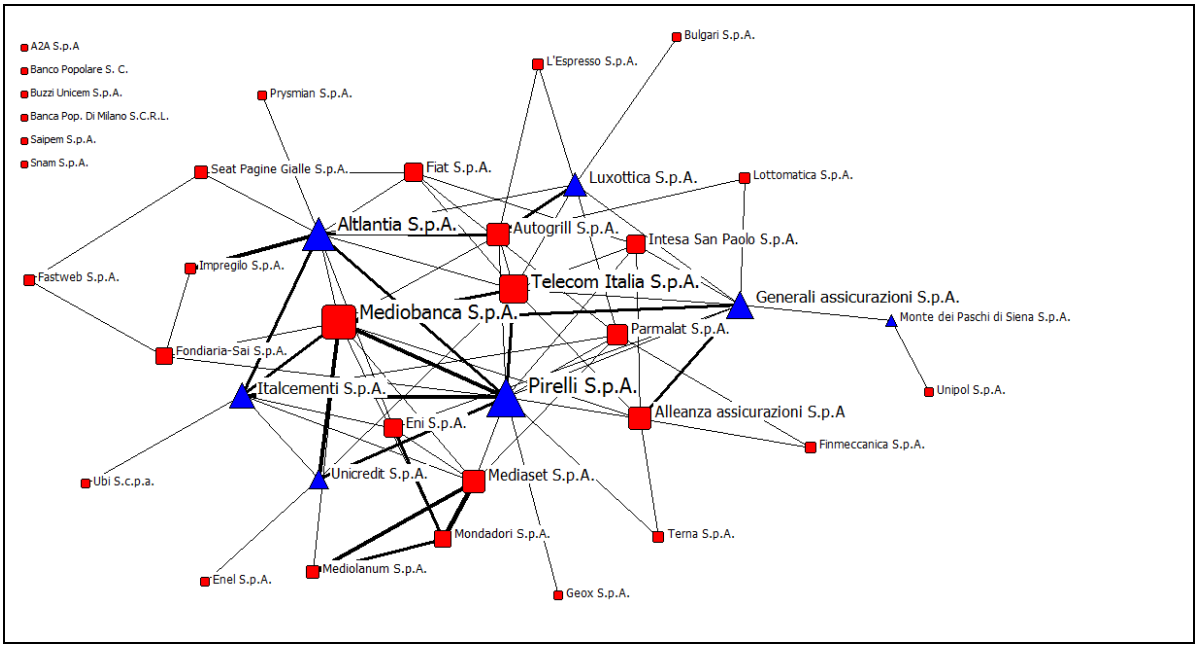
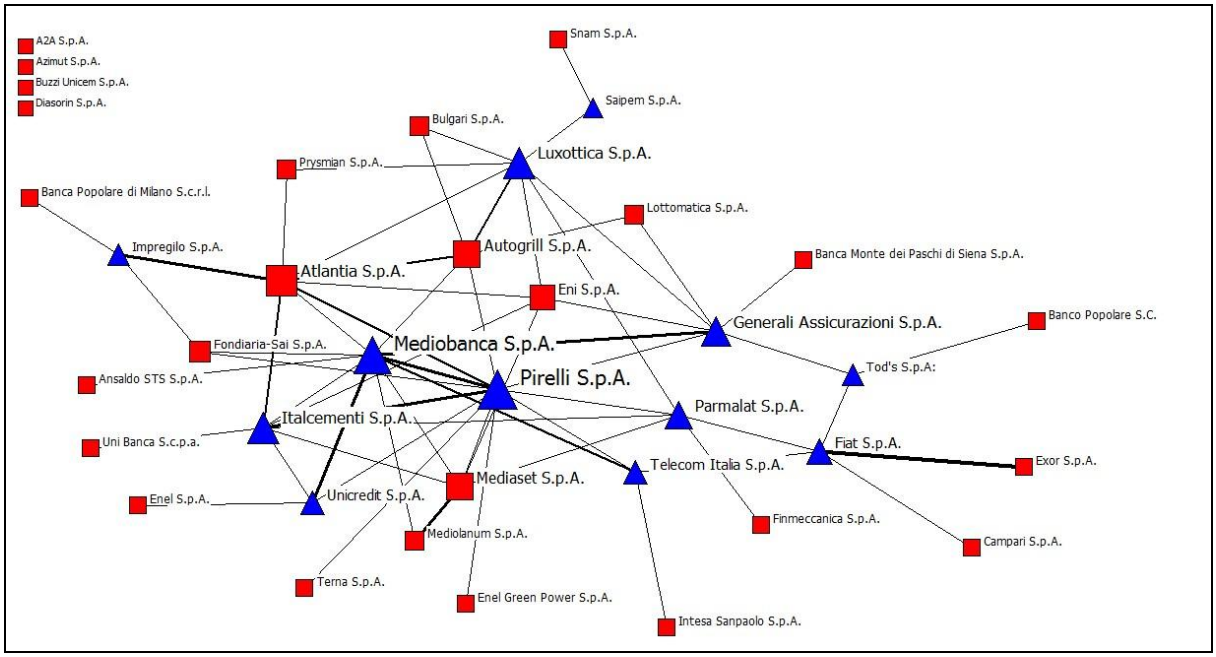


**Figure 3.** Interlocking directorship network among Italian listed companies in the FTSE MIB (year 2010)




## 6. Conclusions

The analyses reported in the previous sections lead us to develop some brief concluding remarks.

First, there is no doubt that during the observation period of this study, significant changes took place in the personal ties amongst large companies listed on the regulated Italian market. Indeed, all summary indicators examined show considerable changes, especially in the period 2008-2010.

A first analysis of the results obtained, which deserve to be further explored and validated through expanding the data collected, would seem to refute the hypothesis that the sharing of directors between large companies could find wider dissemination concurrently with the periods of general crisis on a national and international level. Therefore, the results obtained contradict, from a certain perspective, some previous studies that consider interlocking directorate as the effect of strategies adopted by companies to reduce environmental uncertainty (Schoorman *et al.*, 1981). According to this perspective, one would have expected that in a period of crisis the response of firms would be to intensify their relations with other entities.

It should be added, however, that several recent studies, while confirming the gradual reduction of the phenomenon of sharing directors in national contexts, report a significant increase in interlocking directorate at the international level (Heemskerk, 2013). It would thus be interesting to ascertain as a further future development of this research whether the reduction of personal ties, in the context of companies under Italian law, has been partially offset by the creation of new ties with foreign firms. This would be unsurprising, especially in light of the aforementioned studies that consider international networks as an instrument adopted by firms to acquire new distinct competencies and resources that are needed to initiate the revitalization and recovery of economic activities.

Contrary to what one might have expected, in this research we observe that in the period 2008-2010 – i.e., in the period immediately following the spread of the crisis in the context of the real economy and in international finance – the personal ties between the main listed companies on the regulated Italian market have significantly decreased. In a dynamic perspective, the interlocking directorate network between the firms under observation has evolved in terms of the lower density of ties, the greater distance between firms and the lower degree of hierarchy in the network.

Personal ties, although present to a significant extent between Italian listed companies – to the degree of enabling identifying cliques characterized by a high degree of centrality and stability – significantly decreased, especially in the period 2008-2010. This evidence, which warrants further study using a larger sample of companies and extending the time period of observation, provides new scenarios to investigate the effects of the crisis on relationships between companies.

A possible interpretation of the observed trends could be found in the need for some companies to renew, at least partially, the composition of their governance bodies to signal discontinuity to the market and manage the international economic crisis with renewed strategies. In this perspective, it is conceivable that a change in top management has caused (perhaps only temporarily) the rupturing of some of the personal interrelations built over the years

by the companies under study. In short, the crisis to some extent seems to be a destabilizing factor of interlocking ties: the turnover of directors that generally follows the emergence of a crisis and the need to reconsider some alliances could be relevant factors that limit – at least temporarily – the phenomenon in question. If this were the case, future research could also usefully examine whether the new crisis condition, now ongoing since 2008, has over the years enabled the gradual formation of new ties between major Italian listed companies.

These conclusions lead to resuming a key issue previously identified in other studies (Heemskerk, 2013). Remaining to be assessed is whether the evolution of the interlocking network (in this case, its reduction in national contexts) is the result of a choice adopted by companies or whether, to the contrary, the changes of the network of personal ties between companies remains largely the result of a complex process of co-optation between a few directors who represent an elite within the business system. The relative high degree of network density and the presence of redundant ties between associated companies, although reducing as a result of the crisis, suggest that the significant drive towards the creation of a personal network between companies is attributable to the volition of these directors to enhance their status and their ability to indirectly govern national and international economic levers.

## References


1. Aaronovitch, S. (1961), *A Study of British Finance Capital*, Laurence and Wishart, London.
2. Allen, M. P. (1974), "The Structure of Interoganizational Elite Co-optation: Interlocking Corporate Directorates", *American Sociological Review, 39* (3), 393-406.
3. Andersen, O. (1993), "On the Internationalization Process of Firms - a Critical Analysis", *Journal of International Business Studies, 24* (2), 209-231.
4. Arena, C. (2012), "Professione amministratori: interlocking directorship e qualità degli utili nelle imprese italiane quotate", *Financial Reporting* (2), 81-109.
5. Arthaud-Day, M. L., Certo, S. T., Dalton, C. M., and Dalton, D. R. (2006), "A changing of the guard: Executive and directors turnover following corporate financial restatements", *Academic Management Journal, 49* (6), 1119-1136.
6. Beasley, M. S. (1996), "An empirical analysis of the relation between the board of director composition and financial statement fraud", *Accounting Review*, 443-465.
7. Booth, J. R., and Deli, D. N. (1996), "Factors affecting the number of outside directorships held by CEOs", *Journal of Financial Economics, 40* (1), 81-104.
8. Borgatti, S. P., Everett, M. G., and Freeman, L. C. (2002), Ucinet for Windows: Software for social network analysis.
9. Burt, R. S. (1983), *Corporate Profits and Cooptation*, Academic, New York.
10. Carrington, P. J., Scott, J., and Wasserman, S. (2005), *Models and methods in social network analysis*, Cambridge university press.
11. Carroll, W. K., Fennema, M., and Heemskerk, E. M. (2010), "Constituting Corporate Europe: A Study of Elite Social Organization", *Antipode, 42* (4), 811-843.
12. Cheit, E. F. (1964), *The Business Establishment*. John Wiley and Sons Inc., New York.
13. Coles, J. L., Daniel, N. D., and Naveen, L. (2008), "Boards: Does one size fit all?", *Journal of Financial Economics, 87* (2), 329-356.
14. Comet, C., and Pizarro, N. (2011), "The cohesion of intercorporate networks in France", *Procedia Social and Behavioral Sciences, 10*, 52-61.
15. Croci, E., and Grassi, R. (2010), "The economic effect of interlocking directorates in Italy: new evidence using centrality measures", *Computational and Mathematical Organization Theory*, 1-24.
16. D'Aveni, R. A., and Kesner, I. F. (1993), "Top managerial prestige, power and tender offer response: A study of elite social networks and target firm cooperation during takeovers", *Organization Science, 4* (2), 123-151.
17. Dahl, R. A., Haire, M., and Lazarfeld, P. (1959). *Social Science Research on Business*, Columbia University Press, New York.
18. Dalton, D. R., Daily, C. M., Johnson, J. L., and Ellstrand, A. E. (1999), "Number of directors and financial performance: A meta-analysis", *Academy of Management Journal, 42* (6), 674-686.
19. Di Pietra, R., Grambovas, C. A., Raonic, I., and Riccaboni, A. (2008), "The effects of board size and 'busy'directors on the market value of Italian companies", *Journal of Management & Governance, 12* (1), 73-91.
20. DiMaggio, P. J., and Powell, W. W. (1983), "The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields", *American Sociological Review*, 147-160.
21. Dively, G. (1972), *The Power of Professional Management*, American Management Association Inc., New York.
22. Domhoff, G. W. (1967), *Who Rules America?*, Prentice-Hall, Englewood Cliffs.
23. Dooley, P. (1969), "The Interlocking Directorate", *American Economic Review, 59* (3), 314-323.
24. Drago, C., Millo, F., Ricciuti, R., and Santella, P. (2011), "Corporate governance reforms, interlocking directorship networks and company value in Italy (1998-2007)", CESifo working paper, Industrial Organisation.
25. Eisenberg, T., Sundgren, S., and Wells, M. T. (1998), "Larger board size and decreasing firm value in small firms", *Journal of Financial Economics, 48* (1), 35-54.
26. Elouaer Mrizak, S. (2009), "Interlocking Directorates and Firm Performance: Evidence from French Companies", *available at SSRN 1589663*.
27. Erkens, D. H., Hung, M., and Matos, P. (2012), "Corporate governance in the 2007-2008 financial crisis: Evidence from financial institutions worldwide", *Journal of Corporate Finance, 18*, 389-411.
28. Everard, A., and Henry, R. (2002), "A social network analysis of interlocked directorates in electronic commerce firms", *Electronic Commerce Research and Applications, 1* (2), 225-234.

29. Fahlenbrach, R., Low, A., and Stulz, R. M. (2010), "The dark side of outside directors: Do they quit when they are most needed?", *Finance Working Paper - European Corporate Governance Institute (ECGI), 281*.
30. Fennema, M., and Schijf, H. (1979), "Analysing interlocking directorates: theory and methods", *Social Networks, 1* (4), 297-332.
31. Fich, E. M., and Shivdasani, A. (2006), "Are busy boards effective monitors?", *The Journal of Finance, 61* (2), 689-724.
32. Fich, E. M., and White, L. J. (2005), "Why do CEOs reciprocally sit on each other's boards?", *Journal of Corporate Finance, 11* (1), 175-195.
33. Finklestein, S., Hambrick, D. C., and Cannella Jr., A. A. (2009), *Strategic Leadership: Theory and Research on Executives, Top Management Teams, and Boards*, Oxford University Press, Oxford.
34. Freeman, L. C. (1977), "A set of measures of centrality based on betweenness", *Sociometry*, 35-41.
35. Freeman, L. C. (1979), "Centrality in social networks conceptual clarification", *Social Networks, 1* (3), 215-239.
36. Freeman, L. C. (2004), *The development of social network analysis*, Empirical Press Vancouver.
37. Gambini, A., Sarno, E., and Zazzaro, A. (2012), "Composizione e struttura di rete tra le societa'quotate in Italia", Money and Finance Research group (Mo. Fi. R.) - Univ. Politecnica Marche-Dept. Economic and Social Sciences.
38. Hallock, K. F. (1997), "Reciprocally interlocking boards of directors and executive compensation", *Journal of Financial and Quantitative Analysis, 32* (3), 331-344.
39. Heemskerk, E. M. (2007), *Decline of the corporate community: Network dynamics of the Dutch business elite*, Amsterdam University Press.
40. Heemskerk, E. M. (2013), "The rise of the European corporate elite: evidence from the network of interlocking directorates in 2005 and 2010", *Economy and Society, 42* (1), 74-101.
41. Hermalin, B. E., and Weisbach, M. S. (1988). "The determinants of board composition", *RAND Journal of Economics, 19* (4), 589-606.
42. Holden, P., Fish, L., and Smith, H. (1941), *Top-Management Organization and Control*. Stanford University Press, Stanford University, CA.
43. Houle, C. O. (1990), "Who should be on your Board?", *Nonprofit World, 8* (1), 33-35.
44. Huse, M., Nielsen, S. T., and Hagen, I. M. (2009), "Women and Employee-Elected Board Members, and Their Contributions to Board Control Tasks", *Journal of Business Ethics, 89* (4), 581-597.
45. Jensen, M. C. (1993), "The Modern Industrial-Revolution, Exit, and the Failure of Internal Control-Systems", *Journal of Finance, 48* (3), 831-880.
46. Khanna, T., and Thomas, C. (2009), "Synchronicity and firm interlocks in an emerging market", *Journal of Financial Economics, 92* (2), 182-204.
47. Koening, T., Gogel, R., and Sonquist, J. (1979), "Models of the Significance of Interlocking Corporate Directorates" *American Journal of Economics and Sociology, 38* (2), 173-186.
48. Li, L., Tian, G., and Yan, W. (2013), "The Network Of Interlocking Directorates And Firm Performance In Transition Economies: Evidence From China", *Journal of Applied Business Research, 29* (2), 607-620.
49. Lipton, M., and Lorsch, J. W. (1992), "A Modest Proposal for Improved Corporate Governance", *Business Lawyer, 48* (1), 59-77.
50. Luo, Y. (2005). How does globalization affect corporate governance and accountability? A perspective from MNEs. *Journal of International Management, 11*, 19-41.
51. Mace, M. L. (1971), *Directors: Myth and reality*, Division of Research, Graduate School of Business Administration, Harvard University Cambridge, MA.
52. MacLean, M., Harvey, C., and Press, J. (2006), *Business elites and corporate governance in France and the UK*, Palgrave Macmillan, Hampshire.
53. Mills, C. W. (1956), *The Power Elite*, Oxford University Press, New York.
54. Mizruchi, M. S. (1996), "What do interlocks do? An analysis, Critique, and Assessment of Research on Interlocking Directorates", *Annual Review of Sociology, 22*, 271-298.
55. Nielsen, S., and Huse, M. (2010a), "The Contribution of Women on Boards of Directors: Going beyond the Surface", *Corporate Governance-an International Review, 18* (2), 136-148.
56. Nielsen, S., and Huse, M. (2010b). "Women directors' contribution to board decision-making and strategic involvement: The role of equality perception", *European Management Review, 7* (1), 16-29.
57. Non, M., and Franses, P. (2007), "Interlocking boards and firm performance: evidence from a new panel database", *available at SSRN 978189*.
58. Pennings, J. M. (1980), *Interlocking Directorates*. Jossey-Bass, San Francisco.
59. Perlo, V. (1957), *The Empire of High Finance*, International Publishers Co. Inc., New York.
60. Pfeffer, J. (1972), "Size and Composition of Corporate Boards of Directors: The Organization and its Environment", *Administrative Science Quarterly, 17*, 218-229.
61. Pfeffer, J., and Salancik, G. R. (1978), *The External Control of Organisations: A Resource Dependence Perspective*, Harper & Row, New York.
62. Phan, P. H., Lee, S. H., and Lau, S. C. (2003), "The performance impact of interlocking directorates: the case of Singapore", *Journal of Managerial Issues*, 338-352.
63. Platt, H., and Platt, M. (2012), "Corporate board attributes and bankruptcy" *Journal of Business Research, 65* (8), 1139-1143.
64. Prell, C. (2012), *Social Network Analysis*, SAGE Publications Ltd, London.
65. Sabidussi, G. (1966), "The centrality index of a graph", *Psychometrika, 31* (4), 581-603.
66. Sanders, W. G., and Carpenter, M. A. (1998), "Internationalization and firm governance: The roles of CEO compensation, top team composition, and board structure", *Academy of Management Journal, 41* (2), 158-178.
67. Santella, P., Drago, C., Polo, A., and Gagliardi, E. (2008), "Una comparazione tra le reti di amministratori nelle principali società quotate in Italia, Francia e Gran Bretagna", *L'industria* (2), 271-288.
68. Schoorman, F. D., Bazerman, M. H., and Atkin, R. S. (1981), "Interlocking Directorates: A Strategy for

Reducing Environmental Uncertainty", *Academy of Management Review, 6* (2), 243-251.
69. Scott, J. (2013). *Social Network Analysis*, SAGE Publications.
70. Silva, F., Majluf, N., and Paredes, R. D. (2006), "Family ties, interlocking directors and performance of business groups in emerging countries: The case of Chile", *Journal of Business Research, 59* (3), 315-321.
71. Stokman, F. N., Vanderknoop, J., and Wasseur, F. W. (1988), "Interlocks in the Netherlands - Stability and Careers in the Period 1960-1980", *Social Networks, 10* (2), 183-208.
72. Stuart, T. E., and Yim, S. (2010). Board interlocks and the propensity to be targeted in private equity transactions. *Journal of Financial Economics, 97*(1), 174-189.
73. Taylor, R. N. (1975), "Age and experience as determinants of managerial information processing and decision making performance", *Academy of Management Journal, 18* (1), 74-81.
74. Useem, M. (1979), "The social organization of the American business elite and participation of corporation directors in the governance of American institutions", *American Sociological Review*, 553-572.
75. Vafeas, N. (1999), "Board meeting frequency and firm performance". *Journal of Financial Economics, 53* (1), 113-142.
76. van Veen, K., and Elbertsen, J. (2008), "Governance Regimes and Nationality Diversity in Corporate Boards: A Comparative Study of Germany, the Netherlands and the United Kingdom", *Corporate Governance - An International Review, 16* (5), 386-399.
77. van Veen, K., and Kratzer, J. (2011), "National and international interlocking directorates within Europe: corporate networks within and among fifteen European countries", *Economy and Society, 40* (1), 1-25.
78. Waelchli, U., and Zeller, J. (2013), "Old captains at the helm: Chairman age and firm performance", *Journal of Banking & Finance, 37*, 1612-1628.
79. Wasserman, S., and Faust, K. (1994), Social Network Analysis: Methods And Applications (Structural Analysis In The Social Sciences), Cambridge University Press, New York.
80. Wellman, B., and Berkowitz, S. D. (1988), Social structures: A network approach, Cambridge University Press.
81. Windolf, P. (2002), *Corporate networks in Europe and the United States*, Oxford University Press, New York.
82. Windolf, P., and Beyer, J. (1996), "Co-operative capitalism: corporate networks in Germany and Britain", *The British Journal of Sociology, 47* (2), 205-231.
83. Withers, M. C., Corley, K. G., and Hillman, A. J. (2012), "Stay or Leave: Directors Identities and Voluntary Exit from the Board During Organizational Crisis", *Organizational Science, 23* (3), 835-850.
84. Yermack, D. (1996), "Higher market valuation of companies with a small board of directors", *Journal of Financial Economics, 40* (2), 185-211.
85. Zajac, E. J. (1988), "Interlocking Directorates as An Interorganizational Strategy: A test of Critical Assumptions", *Academy of Management Journal, 31* (2), 428-438.
86. Zeitlin, M. (1974), "Corporate Ownership and Control: The Large Corporation and the Capitalist Class", *American Journal of Sociology, 79* (5), 1073-1119.

## Appendix A –Sample composition (FTSE MIB – Borsa Italiana)

| | |
|---|---|
| Year 2006 (31/12/2006) | Aem S.p.A., Alitalia S.p.A., Alleanza Assicurazioni S.p.A., Autogrill S.p.A., Autostrade S.p.A., Banca Intesa S.p.A., Banca Monte dei Paschi di Siena S.p.A., Banca Popolare di Milano S.c.r.l., Banca Popolare Italiana S.C., Banche Popolari Unite S.c.p.a., Banco Popolare di Verona e Novarla S.c.a.r.l., Bulgari S.p.A., Capitalia S.p.A., Enel S.p.A., Eni S.p.A., Fastweb S.p.A., Fiat S.p.A., Finmeccanica S.p.A., Fondiaria-Sai S.p.A., Generali Assicurazioni S.p.a., Italcementi S.p.A., L'Espresso S.p.A., Lottomatica S.p.A., Luxottica S.p.A., Mediaset S.p.A., Mediobanca S.p.A., Mediolanum S.p.A., Mondadori S.p.a., Parmalat S.p.A., Pirelli S.p.A., Saipem S.p.A., Sanpaolo Imi S.p.A., Seat Pagine Gialle S.p.A., Snam S.p.A., Telecom Italia S.p.A., Terna S.p.A., Unicredito Italiano S.p.A., Unipol S.p.A. |
| Year 2008 (31/12/2008) | A2A S.p.A., Alleanza Assicurazioni S.p.A., Atlantia S.p.A., Autogrill S.p.A., Banco Popolare S. C., Bulgari S.p.A., Buzzi Unicem S.p.A., Enel S.p.A., Eni S.p.A., Fastweb S.p.A., Fiat S.p.A., Finmeccanica S.p.A., Fondiaria-Sai S.p.A., Generali Assicurazioni S.p.A., Geox S.p.A., Impregilo S.p.A., Intesa San Paolo S.p.A., Italcementi S.p.A., L'Espresso S.p.A., Lottomatica S.p.A., Luxottica S.p.A., Mediaset S.p.A., Mediobanca S.p.A., Mediolanum S.p.A., Mondadori S.p.A., Monte dei Paschi di Siena S.p.A., Parmalat S.p.A., Pirelli S.p.A., Banca Pop. Di Milano S.C.R.L., Prysmian S.p.A., Saipem S.p.A., Seat Pagine Gialle S.p.A., Snam S.p.A., Telecom Italia S.p.A., Terna S.p.A., Ubi S.c.p.a., Unicredit S.p.A., Unipol S.p.A. |
| Year 2010 (31/12/2010) | A2A S.p.A., Ansaldo STS S.p.A., Atlantia S.p.A., Autogrill S.p.A., Azimut S.p.A., Banco Popolare S.C., Banca Monte dei Paschi di Siena S.p.A., Banca Popolare di Milano S.c.r.l., Bulgari S.p.A., Buzzi Unicem S.p.A., Campari S.p.A., Diasorin S.p.A., Enel S.p.A., Enel Green Power S.p.A., Eni S.p.A., Exor S.p.A., Fiat S.p.A., Finmeccanica S.p.A., Fondiaria-Sai S.p.A., Generali Assicurazioni S.p.A., Impregilo S.p.A., Intesa Sanpaolo S.p.A., Italcementi S.p.A., Lottomatica S.p.A., Luxottica S.p.A., Mediaset S.p.A., Mediobanca S.p.A., Mediolanum S.p.A., Parmalat S.p.A., Pirelli S.p.A., Prysmian S.p.A., Saipem S.p.A., Snam S.p.A., Telecom Italia S.p.A., Terna S.p.A., Tod's S.p.A., Uni Banca S.c.p.a., Unicredit S.p.A. |