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Positive Freedom in Networked Capitalism: An Empirical Analysis

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Summary

The article proposes a social network analysis of the main European capitalisms and its correspondence with an index of economic freedom. The analysis relates to two kinds of economic liberties taken from the concept of freedom formulated by Isaiah Berlin. While the first kind of freedom (negative freedom) depends on the external system (e.g. the constraints on the firm defined by the regulations), the second refers to the internal obligations within the business system itself that prevent the free exercise of business (positive freedom): specifically, the social network, in which the company is embedded. After an operationalization of the two concepts of freedom, the analysis of a comprehensive database allows us to explore the relationship between the two kinds of freedom.

Keywords: Social Network Analysis, Antitrust Policies, Interlocking Directorates, Europe, Positive Freedom, Negative Freedom
JEL Classification: L4, P

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Positive Freedom in Networked Capitalism: An Empirical Analysis

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Abstract

The article proposes a social network analysis of the main European capitalisms and its correspondence with an index of economic freedom. The analysis relates to two kinds of economic liberties taken from the concept of freedom formulated by Isaiah Berlin. While the first kind of freedom (negative freedom) depends on the external system (e.g. the constraints on the firm defined by the regulations), the second refers to the internal obligations within the business system itself that prevent the free exercise of business (positive freedom): specifically, the social network, in which the company is embedded. After an operationalization of the two concepts of freedom, the analysis of a comprehensive database allows us to explore the relationship between the two kinds of freedom.

Keywords: social network analysis, antitrust policies, interlocking directorates, Europe, positive freedom, negative freedom.

Résumé

L'article propose une analyse des réseaux sociaux des principaux capitalismes européens et de sa relation avec un indice de liberté économique . L'analyse concerne deux types de libertés économiques, à partir de la notion même de la liberté d'Isaiah Berlin. Alors que le premier genre de liberté (liberté négative) dépend du système externe à l'entreprise (par exemple , les contraintes de la législation fiscale de l'entreprise), le second type désigne les contraintes internes au système d'entreprise qui empêchent le libre exercice de entreprise (liberté positive): en particulier, le réseau

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social, dans laquelle l'entreprise évolue. Après d'une opérationalisation des deux types de liberté, l'analyse d'une base de données il permet d'explorer la relation entre les deux libertés, dans les principales capitalismes européens .

Mots-clés: analyse des réseaux sociaux ; politiques antitrust; directions imbriquées; Europe; Liberté positive; Liberté négative.

1. Introduction

A network consists of companies, countries, individuals, etc. connected by ties, business relationships, friendship, etc. In the case of interlocking directorate networks, a tie occurs when two companies share an administrator: there are links interconnecting (interlocking) the two companies, because there is a seat on the boards of these companies (directorates) occupied by the same person (the director in common).

The literature has always considered this kind of bond as a market distortion element, since it creates a clear interdependence between potentially competing economic actors (Dooley, 1969 Drago et al 2011). Thus, this type of tie favors collusion, cooptation and monitoring at the inter organizational level, either by companies in the same economic sector or by companies from different sectors (Mizruchi, 1996). The company absorbs the knowledge of the elements of the external environment through interlocking directorship. At the same time the company can affect the market by creating links between economic actors.

This article aims to explore the economic meaning of freedom (through a reformulation of the successful proposal of Isaiah Berlin in 1958) by means of data analysis. More importantly, the concept of freedom is essentially contestable, as Berlin himself says (Casarin, 2008), given its polysemic nature,. In this study, the operation and the confrontation between the two freedoms arises from a reformulation of Berlin's classical definition(1958): freedom in its positive sense, is characterized by "self-control", the "be free to", whilst freedom in its negative sense is conceived of as "non-interference", "be free". In our reformulation, negative freedom depends on external agents to the field of business (government, unions, regulatory agencies, current legislation, etc.) while positive freedom depends on internal factors of the enterprise system and the company (specifically, the links created by interlocking loops).

Negative freedom is what the individual cannot do, due to external obstacles and limitations.

Negative freedom represents what an individual can or cannot do because of the constraints imposed by the Law. That is, where there are less constraints due to the regulations then there is

more freedom for the individual. In this regard the freedom is negative: less constraints (due to the regulations) increase their freedom.

In this case, the less external links the company has (for example, any tampering in the company's field of action by the State), the higher the score on the Holmes Index 2011. On the other hand positive freedom depends on the constraints defined by the agents internally. While the indexes of economic freedom in the literature only highlight the level of "external" freedom (here also called "negative freedom"), in this paper some structural statistics will be used to represent the links with the internal freedom (the enterprise system): for example, the positive freedom to act independently and freely, to achieve objectives set by the company, without the interference of shared directors with other companies.

As Eccles suggests (1981) an integrated company in its social relations system stops being an autonomous agent and becomes a "quasi firm" when networks become the economic agent. So a capitalism with fragmented ties and no links between companies represents an episode of "positive freedom". This means the company is free when interlocking is not present between it and other companies, which may affect their choices and administration. Adam Smith in Book I of *The Wealth of Nations* wrote:

"The people of the same trade seldom meet together, even if they are happy and joyful moments, but the talks end in a conspiracy against the public, or some incentive to raise prices. Indeed, it is impossible to avoid such meetings through laws that may be met and are consistent with the spirit of freedom and justice. However, while the law cannot hinder people of the same occupation to meet sometimes, nothing should be done to facilitate such meetings and much less to render them necessary."

What this article is proposing is relatively simple. From a sample of sixteen observations (the main European capitalisms), the two freedoms are operationalized and correlated with each other, in order to test the correlation between the two variables.

In the article, more space is dedicated to the analysis of positive freedom. Specifically, the social network analysis techniques allows an operationalization of the concept of network, its graphical representation –graph; the development of a set of statistics at the macro level -e.g. the network as a whole and micro level- nodes, also called vertices of the network (Wassermann and Faust, 1994; Chiesi, 1999). In the last three decades, these techniques have gained an ever-increasing number of followers. This is evidenced by the proliferation of articles and studies that use social network analysis as the main methodological support for the creation of new journals in the area, as well as international research centers such as the International Network for Social Network Analysis (INSNA). However, this interest in social network analysis is not new; the first studies occurred in

the first half of the twentieth century (Moreno, 1934); but it was from the 1960's that anthropologists from the movement of the Manchester School began to pay more attention to culturally prescribed ties, especially those which could be found to encourage the development of statistics and the formalization of the main concepts in social network analysis such as the direction of ties, the density, connectivity and reciprocity (Gluckman, 1965; Mutti, 1996). Following this, in the 1970's, Harrison White and his group of collaborators at Harvard applied a more rigorous statistical point of view, thus solving the main problems of mathematical formalization (White et al., 1976). The contribution of the Harvard group was instrumental in the development of network analysis techniques.

In this analysis perspective, the notion that companies are simple combinations of attributes (stock market indices, corporate balance sheet) is substantially rejected. The main field of social-and economic-life is that the networks, their social relations, at the same time, incorporate and transcend organizations (companies) and institutions (e.g. the market). As Granovetter (1985) states, it is not possible to understand economic organization and markets without tracing them back to the influences exercised independently by the networks of social relations within which economic actors are inserted. These bonds give rise to a complex relational system running through the internal levels of an organization (intra-organizational) and beyond its borders (inter-organizational levels).

In the present analysis social roots are viewed in structural terms and it is presumed, therefore, that the action of an economic actor is guided by the network, that is, basically influenced by networks of relationships in which the family are involved (and not by any form of institutional regulation, such as the market in the neoclassical view of the economy). When companies control each other through direct and indirect ties, the market loses its function as an economic regulator. So the stable network relationship - as in the case of interlocking - is a structure that must be reconstructed, in order to understand on the one hand the diffusion of this kind of bond which possibly affects the regulation of the market and on the other hand to assess its effects on economic behavior.

2. Interlocking and Regulation

The Clayton Act in the United States, the Antimonopoly Law in Japan, legislation on fair competition in South Korea and Indonesia, represent isolated cases of jurisdictions that have introduced legal provisions that expressly prohibited the practice of interlocking directorates between competitors.

Under Articles 81 and 82 of the EU Treaty, the Court of Justice of Europe has already considered the presence of interlocking as evidence of anti-competitive conduct, the result of an acquisition or merger being considered illegal (OECD, 2009).

According to the OECD (2009) there does not exist in Europe a legislation similar to the Clayton Act in the US. In Italy, for example, the question is somewhat contradictory. In the Italian Civil Code, specifically Article 2390, it was forbidden for the chief executive officer (CEO or Deputy Director) of a company to assume management positions in competing companies. In more recent times, the Decree-Law n°. 201, 2011, and the Law no°. 214, 2011, raised again the issue by prohibiting members of boards of directors of banks and insurance companies to assume or exercise similar positions in competing companies. The Law n° 214 intended to respond to a clear demand from the Italian Antitrust Authority as highlighted in many of its reports (AGCM, 2008; Carbonai, Di Bartolomeo, 2009). On the other hand, the Law does not provide a clear system of sanctions.

What the studies highlight is that collusion and coordination between companies also occur in the presence of an ad hoc legislation. Social network analysis demonstrates that all companies operating in the same economic sector - thus competitors - even if not directly connected, can always be coordinated through a third company of another economic sector, which joins the two by means of indirect interlocking. Therefore, it is always the network, in its general structure, which allows a better understanding of the extent of collusion.

3. The Interlocking Networks Directorates

What comparative surveys point out is that the Anglo-American system of governance shows the lowest proportion of multiple directors and the lowest accumulation of positions (Santella et al. 2009); the German system (Austria, Germany, Holland and Switzerland) occupies an intermediate position; Latin

American countries have the highest proportion of interlocking, with a greater accumulation of positions (Stokman, 1985).

The Cardenas analysis (2012) reveals the existence of two types of enterprise networks. The first type is characterized by a high number of links between large corporations, which can promote unity and articulation of common interests. Within this type of enterprise network, also called "elitist" are Italy, France Germany, Spain and Canada. The pluralistic enterprise networks are characterized by low cohesion indices; these networks are not centralized; within the corporate space structure there are several power centers, suggesting increased competition. Within this type

of enterprise network, called "pluralistic", are the United Kingdom, Japan, the United States, Australia, Switzerland, the Netherlands and Sweden.

As Windolf (2002) shows the differences between corporate networks in Europe (Germany, France, Netherlands, Switzerland, UK) and the United States depend mainly on the influence of legislation. But, as highlighted by Marques (2007), given the level of detail involved, only the implementation of many comparative studies of networks in different social situations may, in the medium term, suggest what kind of influences they exert, given the circumstances and the present cases. Unfortunately, as also Kees van Veen and Jan Kratzer (2011) point out, research is limited to reconstructing the interlocking networks in a country or an economic sector, without comparison with other cases, that is, the highlighting of the key statistics of the structure: the average numberof interlocking directors, the centrality of companies, the relationship with the market share, etc.

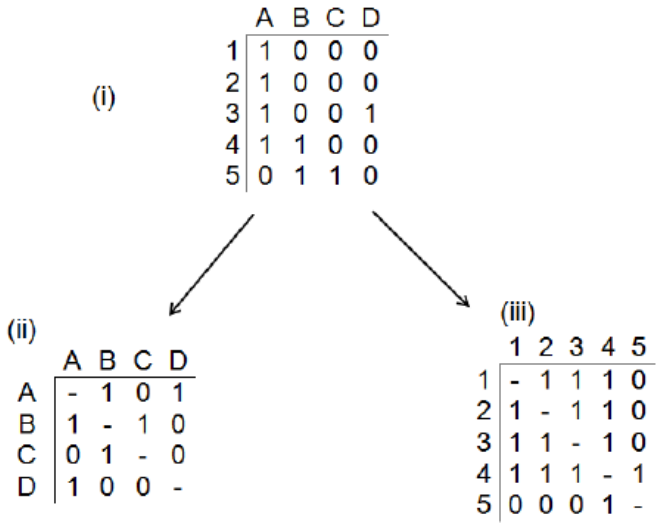
Yet, the practice of interlocking is not only applicable to the European case or to the United States but is also widespread in Brazil; for example, in 2003, 74% of 319 companies from a sample had at least one director of another company (Santos et al., 2009). Staying with Brazil, based on the data of listed companies available on the Securities and Exchange Commission (CVM), a sample of 347 firms and their advisors was obtained, observed in 2009. Of these firms, 69% had one or more members who also appeared on the board of other companies. As a result, of the 347 firms in the sample, 212 (61%) were connected to each other, directly or indirectly, by directors in common. Also with regard to the Brazilian case, boards are shown to be intertwined.

4. Research Methodology

Binary incidence matrices are commonly used in the analysis of interlocking directorates networks: the members of boards of directors are shown on the horizontal rows of the matrix, while companies (affiliations) appear in columns in the horizontal direction (Figure 1). When an administrator is present on the board of company y, the corresponding value is set to 1; otherwise the value is zero.

From this incidence matrix, we can derive two adjacent matrices, both symmetrical, shown in Figure 1. On the lines and in the columns of matrix ii are considered the different firms and the different interlocking directors in common, whilst in the adjacent matrix (iii) we consider the different interlocked directors, the boards they share in common.

Figure 1 - Rectangular Matrix "director-by-affiliation" (i) and adjacency matrices: (ii) company-by-company and (iii) director-by-director.



In this approach, also called "positional", the graphs usually originate from these two arrays of adjacency. The social network analysis - the descriptive statistics of the network - is applied to arrays of adjacency of this type. Generally, it is possible to calculate two types of network statistics: a first assembly with respect to structural properties - or macro - the network (for example, the network density, its connectivity, amplitude, etc.) and a second related to centrality of each vertex included in the network (providing a level of "micro" analysis): the degree of centrality of the node (vertex) x, the amplitude of the ego-network, its betweenness, etc. The centrality, for example, identifies the number of links (interlocking) between company x (Ego) and other companies (Alters) (Freeman, 1979). From the degree of centrality for each vertex, for example, it is possible to calculate the overall average of listed companies in a particular country.

From this approach a hypothesis about the independence of the two economic freedoms is tested. The economic freedom index prepared by the Heritage Foundation is the size of negative economic

freedom, while the three structural statistics represent the size of positive freedom: these three statistics are taken from two databases. In the case of the first and second positive freedom, the data is provided by Amadeus Bureau van Dijk Electronic Publishing system (BvDEP[2]). Data on the composition of the boards were collected in January 2010. Further details can be found in Carbonai (2011). In addition to the executive directors, the database includes the members of the supervisory board (non-executive directors). The supervisory board members are included in the database for several reasons: for example, to monitor and certify that the financial information is accurate, that financial controls and risk management are robust and defensible. Non-executive directors are responsible for determining appropriate levels of executive compensation, appointment and, if necessary, removal of positions. Depending on the type of corporate governance, the board also has supervisory power of veto over decisions of the executive board (Hopt, 2008). Finally, the supervisory board member of company x can be at the same time an executive in company y and z.
The third variable of negative freedom uses the data present in Van Keen and Kratzer (2011) while the latter variable refers to the research of Heemskerk (2011) on transnational networks in Europe. In the first two cases, sixteen observations are present, in the last two there are fourteen observations. As in most studies of this type, Heemskerk. 2011 and Keen and Kratzer (2011) analyzed a sample of listed companies. In both cases, there are few observations relating to the main national capitalisms in Europe. We however consider a non-parametric test- in particular a Spearman correlation.

5. The Paradox of Positive Freedom

The hypothesis of correlation between the two freedoms is tested as follows. Negative liberty is operationalized by Miller and Holmes (2011) in an index of freedom called the Index of Economic Freedom (IEF) by the Heritage Foundation; the index represents various dimensions of negative freedom: fiscal freedom, government size, property rights, etc. The correlation of this index with positive freedom is tested by four bivariate correlations: with four variables that represent – each one - positive freedom, all defined from four analyzes of social networks. The first two can be found in Carbonai (2011), the third in Van Veen and Kratzer(2011), the fourth in Heemskerk's research (2011).
The first structural statistic is defined as "fragmentation". The basic idea is that the more fragmented the network of a national capitalism is the greater the competition between firms is (Carbonai, 2011). An index may be calculated from the number of components, divided by the

number of vertices (amplitude graph). In social network analysis, a component is represented by the vertices (in this case each company) that can be arrived at by direct ties (the distance one) or indirect ties (greater distance than one). The higher the number of components, the greater the fragmentation; the maximum fragmentation is achieved when the number of components is equal to the number of vertices: each company is an isolated node. Considered that the amplitude of the network is different in each capitalism, here we use a version normalized for the range of variation of the fragmentation

$$F_{norm} = \frac{(F_i - F_{\min})}{(F_{\max} - F_{\min})}$$

In the formula, F_i indicates fragmentation capitalism;$F_i$is divided by the theoretical variation of that field's capitalism, which varies from a minimum $F_{\min}$ to a maximum that is always equal to 1, for each capitalism. The second variable, always from the database collected in Carbonai (2011), refers to the average number of adjacent Ego companies: the average amplitude of the ego-networks in all the different considered networks.

The third variable structure, able to represent the positive dimension of freedom, is defined from the search results of Van Veen and Keen (2011, p. 11); we use here the density of each national network in the bivariate correlation with the Heritage Foundation freedom index. In any case the density proposed by Van Veen and Keen (2011, p.11) is computed in this way:

$$D_M = \sum_{i=1}^{Z} \sum_{j=i-1}^{Z} \frac{Z_{ij}}{n(n-1)}$$

D_M density is the result of the sum of the present ties in capitalism, divided by the maximum possible ties n (n-1).

The fourth and final structure variable refers to the research of Heemskerk (2011). The statistic used for the number of companies connected by interlocking directorship is the percentage of companies linked by interlocking directorates on a sample set from the largest companies (fourteen considered capitalisms).

Considered that each network includes few observations (see Table 1), the Spearman correlation coefficient was chosen to test the bivariate correlation between the variables (Table 1).

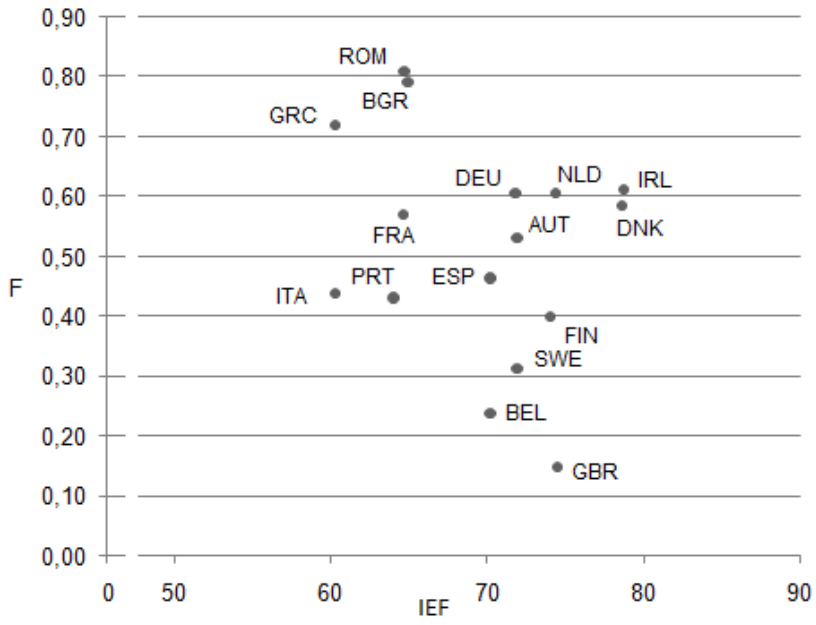
Table 1 - Bivariate correlations between freedom Index (IEF) and four statistical relational structural indicators)

Correlations Spearman's coefficient		(1)	(2)	(3)	(4)	(5)
(1)	IEF	1				
	Sig. (2-tailed)	.				
	N	16				
(2)	Fragmentation	-0,15	1			
	Sig. (2-tailed)	0,57	.			
	N	16	16			
(3)	Egonetwork	0,08	-0,92	1		
	Sig. (2-tailed)	0,75	0,00	.		
	N	16	16	16		
(4)	Density	0,03	0,17	-0,17	1	
	Sig. (2-tailed)	0,89	0,55	0,54	.	
	N	14	14	14	14	
(5)	% interlocking	0,17	-0,27	0,19	0,63	1
	Sig. (2-tailed)	0,55	0,33	0,51	0,01**	.
	N	14	14	14	14	14

** p<0.01 level (2-tailed).

The results of this analysis can be found in column 1. Briefly, there was no significant bivariate correlation in the four tests; in other words, as regards the variables chosen in the representation of positive freedom (network analysis) and negative (Index of Economic Freedom) no significant correlation was found. The case of fragmentation, in the diagram in Figure 2, can better explain this independence.

Figure 2 - economic freedom index IEF (negative freedom) and network fragmentation (positive freedom)



The diagram shows a division of Europe into four distinct groups. On the one hand, Northern Europe with high rates of negative freedom and low positive freedom (UK, Sweden, Finland, Belgium); the second group, North/Central Europe (Austria, Germany, Denmark, Ireland) with a slightly higher positive freedom index; capitalisms not as advanced such as Bulgaria, Romania and Greece, with high levels of fragmentation and low level of negative freedom; Mediterranean Europe with lower levels of negative freedom (in relation to other European countries of Northern Europe) and medium-high fragmentation. That is, positive freedom is not associated with negative freedom.

6. Conclusions

Thus, in the end, what does the analysis of interlocking networks show? First of all, also in line with other research results, the practice of interlocking is widely used in capitalisms. Although the descriptive statistics are not shown, due to the central analysis object (i.e. the correlation between negative and positive freedom) Fragmentation in Figure 2, alone, demonstrated that capitalisms are based on networks of firms and not on firms which are not characterized by absence of connections with other firms.

Secondly, in those capitalisms considered to be “liberal” they are not always free on the positive sense of freedom. We have shown this result empirically. Differently with the actual literature on the topic, which tends to consider negative freedom to be more important, the relational approach shows the other side of freedom, the positive one, freedom from the connection of the network.

Third, a methodological critique of the Heritage Foundation's freedom index exists (Miller, Holmes, 2011). The economic freedom index is usually used to represent a single economic freedom, with no distinction between the two freedoms, Berlin (1958). The index does not include this variable set from a social network analysis point of view. At the same time it could be very relevant to consider the network statistics as a way to represent the freedom for the companies from their connections. In this way we are able to obtain a more representative index of economic freedom.

References

AGCM. AUTORITÀ GARANTE DELLA CONCORRENZA E DEL MERCATO. *La corporate governance di banche e compagnie di assicurazioni*, Indagine conoscitiva, IC36, Roma, 2008.

BERLIN, I. Two Concepts of Liberty. In Isaiah Berlin (1969) *Four Essays on Liberty*. Oxford: Oxford University Press. 1958.

CARBONAI, D. Os administradores em comum: uma análise comparada dos capitalismos Europeus em rede. *Congresso Brasileiro de Sociologia (SBS)*, Curitiba, Anais do Congresso Brasileiro de Sociologia, Curitiba, 2011.

CARBONAI, D.; DI BARTOLOMEO, G. Interlocking directorates as a trust substitute: the Italian non-life insurance industry. Working paper apresentado no *Network, Power, Relations*, Milan, first NPR Workshop, Setembro, 2009.

CÁRDENAS, J. La organización en rede del poder corporativo: una tipología de redes corporativas, Revista Internacional de Sociología (RIS), Córdoba, v.70, n. 1, pp. 77-105, 2012.

CASARIN, J.C.Isaiah Berlin: afirmação e limitação da liberdade.*Rev. Sociol. Polit.*. 2008, vol.16, n.30, pp. 283-295.

CHIESI, A. M. L'élite finanziaria italiana. *Rassegna italiana di sociologia*, n. 4, 1982, pp. 571-595.

CHIESI, A. M. *L'analisi dei reticoli*, Franco Angeli: Milão, 1999.

DOOLEY, Peter C. Interlocking Directorate. *The American Economic Review*, vol. 59, n. 3, 1969, pp. 314-323.

DRAGO, C., MANESTRA, S., & SANTELLA, P. (2011). Interlocking directorships and cross-shareholdings among Italian blue chips. European Business Organization Law Review, 12(04), 619-652.

ECCLES, Robert G. The Quasi-Firm in the Construction Industry. *Journal of Economic Behaviour and Organization*, n. 2, 1981, pp. 335-357.

FREEMAN, L. Centrality in social networks: Conceptual clarification. Social Networks, New York, v.1, 1979, pp. 215-39.

GLUCKMAN, M. Politics, Law and Ritual in Tribal Society, New York: The New American Library. 1965. Tr. It. Potere, diritto e rituale nelle società tribali, Torino: Boringhieri, 1977.

GRANOVETTER, M. Economic Action and Social Structure: The Problem of Embeddedness, *American Journal of Sociology*, n. 91, 1985, pp. 481-510.

HEEMSKERK, E. M. The social field of the European corporate elite: a network analysis of interlocking directorates among Europe's largest corporate boards. *Global Networks*. 11, 4, 2011, pp. 440–60.

MARQUES, E., 2007, Os mecanismos relacionais. Rev. bras. Ci. Soc.. 2007, vol.22, n.64 , pp. 157-161.

MILLER, T,; HOLMES, K. Index of Economic Freedom, New York: The Heritage Foundation and Dow Jones & Company, Inc. 2011.

MIZRUCHI, Mark S. What Do Interlocks Do? An Analysis, Critique, and Assessment of Research on Interlocking Directorates. Annual Review of Sociology, 22, pp. 271- 98, 1996.

MORENO, J. L. Who Shall Survive? Beacon: Beacon House. 1934.

MUTTI, A. Reti sociali: tra metafore e programmi teorici, *Rassegna italiana di sociologia*, n. 1, 1996. pp. 5-30.

OECD. Policy Roundtable. Minority Shareholdings. Directorate for financial and enterprise affaires competition committee. DAF/COMP(2008)30, Antitrust issues involving minority shareholdings and interlocking directorates, 2009. 23 jun, s.l..

SANTELLA, P., DRAGO, C., POLO, A., & GAGLIARDI, E. (2009). A comparison of the director networks of the main listed companies in France, Germany, Italy, the United Kingdom, and the United States. Germany, Italy, the United Kingdom, and the United States (January 20, 2009).

SANTOS, R. L.; SILVEIRA A., AYRES, B. Board Interlocking in Brazil: Directors' Participation in Multiple Companies and its Effect on Firm Value. *Revista Brasileira de Finanças*. Vol. 5, No. 2, 2007. pp. 125-163.

SMITH, A. An Inquiry into the Nature and Causes of the Wealth of Nations. 1776. Edinburgh; trad. it. Indagine sulla ricchezza delle nazioni, 1973. Milão: Isedi.

STOCKMAN, Frans. N.; ZIEGLER, Rolf; SCOTT, John.(org.). *Networks of Corporate Power. A Comparative Analysis of Ten Countries*. Oxford: Oxford University Press, 1985.

VAN VEEN, K.; KRATZER, J. National and international interlocking directorates within Europe: corporate networks within and among fifteen European countries. *Economy and Society*, London, v. 40, n.1, pp. 1-25, 2011.

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

WHITE, H.C.; BOORMAN, S.A.; BREIGER, R.L. Social Structure from Multiple Networks: Block Models of Roles and Positions, *American Journal of Sociology*, n. 81, 1976. pp. 730-780.

WINDOLF, P. *Corporate networks in Europe and the United States*. Oxford: Oxford University Press, 2002.

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