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Winning virtuous strategy creation by interlocking interconnecting directors in boards of directors in firms in information century

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Abstract – The article presents an original research on 1) the information theory of the board of directors and 2) the strategy creation by the interlocking interconnecting directors in the boards of directors in the firms in an information century. We review the possible structures of the board of directors, and show that there are the interlocking directors networks in the boards of directors in a big number of firms. Researching the strategic governance of firms, we highlight a fact that the director makes the information sensing, filtering, processing, resonant absorption, analysis, decision making, hence it can be empirically represented as a digital signal processor with the Harvard or von Neumann director's mindset architectures. We think that the board of directors can be theoretically represented as the electronically-scanned electronically-steered phased array radar with a certain number of active antenna elements, filters banks, digital signal processors, memory chipsets in agreement with the digital signal processing and business administration sciences. Using the theoretical assumptions, we formulate the Ledenyov theory on the winning virtuous strategies creation by the interlocking interconnecting directors in the boards of directors in the firms. We suggest that 1) the transmitted information data-stream measurements, 2) the information bit error rate measurements have to be used to accurately characterize the interlocking interlinking interconnecting directors networks in addition to the well known parameters such as the director's boards seats accumulation number, centrality, Freeman degree, Betweenness. We believe that the positive and negative feedback loops can quite possibly lead to the destructive coordination among the directors by eliminating the randomness element and by introducing the greater uniformity in the pursuing business strategies. We developed the MicroID software program to compute the probability number of the additional directorship mandates issues.

JEL code: C0, G21, G24, G30, G34, L1, L4, M2 .

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Keywords: theory of firm, firm valuation, firm strategy creation, board of directors composition, interlocking directors networks, boards seats accumulation number, centrality, Freeman degree, Betweenness, information flows measurements, destructive coordination, microeconomics, Harvard/von Neumann director's mindset architectures, digital signal processing, electromagnetic signals absorption, chemical elements absorption, information absorption.

Introduction

The *foundational principles in the economics and finances* in Joseph Penso de la Vega (1668, 1996), Mortimer (1765), Bagehot (1873, 1897), von Böhm-Bawerk (1884, 1889, 1921), Hirsch (1896), Bachelier (1900), Schumpeter (1906, 1911, 1933, 1939, 1961, 1939, 1947), Slutsky (1910, 1915 1923), von Mises (1912), Hayek (1945), Ellis, Metzler (1949), Friedman (1953), Baumol (1957), Debreu (1959), Dodd (2014) created an *essential theoretical framework* for a better understanding of *environmental opportunities and limitations* towards the economic and financial agents business activities, making it possible to formulate the *modern evolutionary theory of firm* in Babbage (1832), Ueda (1904, 1937), Marshall (1923), Berle, Means (1932a, b), Ohlin (1933), Coase (1937), Barnard (1938, 1948, 1949, 1958), Solow (August 1957), Modigliani, Miller (June 1958), Baumol (1959, 1962), Penrose (1959), Marris (May 1963), Telser (1963), Williamson (1964, 1975, 1988), Cyert, March (1963, 1992), Fogel (1964), Manne (1965), Stigler (1968), Mano (1968-1969, 1970-1971, 1972-1973 1975-1976, 1978, 1980-1981, 1987, 1994, 1995), Black, Scholes (1973), Black, Cox (1976), Merton (1973, 1974), Lee (1975), Jensen, Meckling (1976), Jensen, Ruback (1983), Jensen (1986, September-October 1989, 1993, 2007), Jensen, Murphy (1990), Fama (1980), Fama, Jensen (1983, 1985), Demsetz (1983, 1997), Wernerfelt (1984, 1995), Lode Li (1986), Perrow (1986), Hart, Moore (1990), Hart (2011), Sberman (2000), Williamson (2002), Kantarelis (2007), Spulber (2009), Ledenyov D O, Ledenyov V O(2013b), where the *evolution of firm* includes the *three clearly identified stages* in Chandler (1962, 1977, 1993, 1994, 1998, 2001, 2005), Chandler, Daems (1980): 1) *Barriers to entry creation*; 2) *Strategic boundaries definition*, and 3) *Limits to growth evaluation*. The *director of firm*, who is a *Leader*, a *Catalyst*, a *Believer*, a *Visionary*, is elected or appointed to the *board of directors* to achieve the *firm's strategic business goals* during the *evolution of enterprise* in Armstrong (1977, 2006). As we know, there are the *two main conditional classifications of directors types*: 1) *Director-Leader*, who introduces the leadership attributes such as being inspirational and visionary in Covey (2004), De Vries (2006), Heyden (2006), Galunic (2006), Nicholson (2007), Rao (2007), Kirkbride (2007), Emmerik (2009), Wendt, Euwema, van Emmerik (2009), Kozłowski (2009), Eisen (2010), Pietersen (2010); 2) *Director-Manager*, who performs the management of enterprise in Dai (2007), Fryer (2009). In the *numerous founded firms* in the *competitive industrial clusters* in Porter (2008), there are the *one- and two-tier directors' boards systems* in Postma, van Ees (2001) with the *interlocking interlinking interconnecting directors' networks* in Dooley (1969), Mariolis (1975), Bunting (1976), Burt (1980), Pennings (1980), Mintz, Schwartz (1981), Schoorman, Bazerman, Atkin

(1981), Palmer (1983), Ornstein (1984), Meeusen, Cuyvers (1985), Stearns, Mizruchi (1986), Mizruchi, Stearns (1988), Mizruchi (1996), Postma, van Ees (2001) Rommens, Cuyvers, Deloof (November 2007), Santella, Drago, Polo, Gagliardi (2009), Uddin (2012). In this empirical condensed essay, the authors would like to do the following things: 1) to review the interconnecting interlocking directors networks configurations in the boards of directors of publicly traded and non-traded firms, and 2) to research the strategy creation problem by the interlocking interconnecting directors in the boards of directors of publicly traded and non-traded firms during the strategic governance of firms in the challenging time, when the innovation breakthrough processes originate an appearance of the creative innovative disruptions during the capitalism evolution in Schumpeter (1911, 1939, 1947), Christensen (Christensen (June 16, 1977; Fall, 1992a, b; 1997; 1998; December, 1998; April, 1999a, b, c; 1999a, b; Summer, 2001; June, 2002; 2003; March, April, 2003; January, 2006), Bower, Christensen (January, February, 1995; 1997; 1999), Christensen, Armstrong (Spring, 1998), Christensen, Cape (December, 1998), Christensen, Dann (June, 1999), Christensen, Tedlow (January, February, 2000), Christensen, Donovan (March, 2000; May, 2010), Christensen, Overdorf (March, April, 2000), Christensen, Bohmer, Kenagy (September, October, 2000), Christensen, Craig, Hart (March, April, 2001), Christensen, Milunovich (March, 2002), Bass, Christensen (April, 2002), Anthony, Roth, Christensen (April, 2002), Kenagy, Christensen (May, 2002; 2002), Christensen, Johnson, Rigby (Spring, 2002), Hart, Christensen (Fall, 2002), Christensen, Verlinden, Westerman (November, 2002), Shah, Brennan, Christensen (April, 2003), Christensen, Raynor (2003), Burgelman, Christensen, Wheelwright (2003), Christensen, Anthony (January, February, 2004), Christensen, Anthony, Roth (2004), Christensen, Baumann, Ruggles, Sadtler (December, 2006), Christensen, Horn, Johnson (2008), Christensen, Grossman, Hwang (2009), Dyer, Gregersen, Christensen (December, 2009; 2011), Christensen, Talukdar, Alton, Horn (Spring, 2011), Christensen, Wang, van Bever (October, 2013)). The authors will apply the sophisticated econometrical econophysical techniques with the purpose to accurately characterize the firm's financial economical performance, achieving the strategic research goals in Schumpeter (1906, 1933), Bowley (1924), Fogel (1964), Box, Jenkins (1970), Grangel, Newbold (1977), Van Horne (1984), Taylor S (1986), Tong (1986, 1990), Judge, Hill, Griffiths, Lee, Lutkepol (1988), Hardle (1990), Grangel, Teräsvirta (1993), Pesaran, Potter (1993), Banerjee, Dolado, Galbraith, Hendry (1993), Hamilton (1994), Karatzas, Shreve (1995), Campbell, Lo, MacKinlay (1997), Rogers, Talay (1997), Hayashi (2000), Durbin, Koopman (2000, 2002, 2012), Ilinski (2001), Greene (2003), Koop (2003), Davidson, MacKinnon (2004), Cameron, Trivedi (2005), Vialar, Goergen (2009).

Review on the structures of boards of directors and the interlocking directors networks configurations in boards of directors in firms

The *authors* believe that *a group of elected appointed directors (institutional agents), who control all the business activities by the management team (corporate agents) toward the firm's business development, constitute a board of directors*. The standard board of directors in the firm can be represented as a matrix in Drago, Polo (November 11 2007), Cai, Garner, Walkling (2009), Whitehead (December 2014), hence the *authors* can write the following empirical expression

$$\mathbf{Board\ of\ Directors} = \begin{vmatrix} \mathbf{d}_{1,1} & \mathbf{d}_{1,2} & \mathbf{d}_{1,j} \\ \mathbf{d}_{2,1} & \mathbf{d}_{2,2} & \mathbf{d}_{2,j} \\ \mathbf{d}_{i,1} & \mathbf{d}_{i,2} & \mathbf{d}_{i,j} \end{vmatrix},$$

where $\mathbf{d}_{i,j}$ is the position of a director's seat in the matrix, which describes the standard board of directors in the firm.

The composition of the board of directors changes over the time. The *board of directors composition dynamics* over the time can be described by the generalized formula as in Santella, Drago, Polo (November 11 2007)

$$\mathbf{board}_{c,t} = \mathbf{board}_{c,t-1} + \int_t^{t+1} (\mathbf{en} - \mathbf{ex}) dt,$$

where

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

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

$\mathbf{en}(t)$ is the number of directors entrants at time t_i ,

$\mathbf{ex}(t)$ is the number of directors exits at time t_i ,

$\mathbf{board}_{c,t}$ is the board of directors size at time t_i ,

c is the company,

i is the director.

In general, the three *main functional tasks by the board of directors* are

1. Corporate governance;
2. Human capital management;
3. Accounting standards compliance revision.

The *broad functional tasks by the boards of directors* may include in Wikipedia (2015)

1. *“Governing the organization by establishing broad policies and objectives;*
2. *Selecting, appointing, supporting and reviewing the performance of the chief executive;*
3. *Ensuring the availability of adequate financial resources;*
4. *Approving annual budgets;*
5. *Accounting to the stakeholders for the organization's performance;*
6. *Setting the salaries and compensation of company management.”*

Let the *authors* highlight some *structural features* of the *board of directors*, namely the fact of presence of the *two types* of the *board of directors*: 1) a ***one-tier board type*** and 2) a ***two-tier board type*** in Wikipedia (2015): “In some *European and Asian countries*, there are *two separate boards*, an ***executive board*** for day-to-day business and a ***supervisory board*** (elected by the shareholders and employees) for supervising the *executive board*. In these countries, the ***CEO*** (*chief executive or managing director*) presides over the *executive board* and the ***chairman*** presides over the *supervisory board*, and these *two roles will always be held by different people*. This ensures a distinction between *management by the executive board* and *governance by the supervisory board* and allows for clear lines of authority. *The aim is to prevent a conflict of interest and too much power being concentrated in the hands of one person*. There is a strong parallel here with the structure of government, which tends to separate the political cabinet from the management civil service. In the *United States*, the *board of directors* (elected by the shareholders) is often equivalent to the *supervisory board*, while the *executive board* may often be known as the *executive committee* (*operating committee* or *executive council*), composed of the *CEO* and their direct reports (*other C-level officers, division/subsidiary heads*).”

The fact that, there are 1) a ***one-tier board type*** and 2) a ***two-tier board type***, depending on the *board internal structure*, is well explained in the academic literature in Postma, van Ees (2001): “In corporate governance systems *boards* perform *three functions*: the *interlocking function* (from a resource-dependency and network perspective), a *monitoring function* (from an agency perspective), and a *strategic function* (from a strategic choice perspective). In a *one-tier board* the *board of directors* incorporates ***non-executive directors*** (outsiders, they sometimes represent the interests of key-stakeholders) and ***executive directors*** (top management) of the firm. In a *two-tier board* there is a clear distinction between the *directors* as members of a *supervisory board* and the *top management team*. The *board* serves in this respect as a ***supervisory board*** vis à vis the ***management board***.”

Prinz (2006) highlights the existing differences between the traditional *Anglo-Saxon one-board-system* and the *German dual board system*, in which the nature of personal ties can be more complex.

Fig. 1 shows the *one-tier board* and *two-tier board* schematic representation in Postma, van Ees (2001).

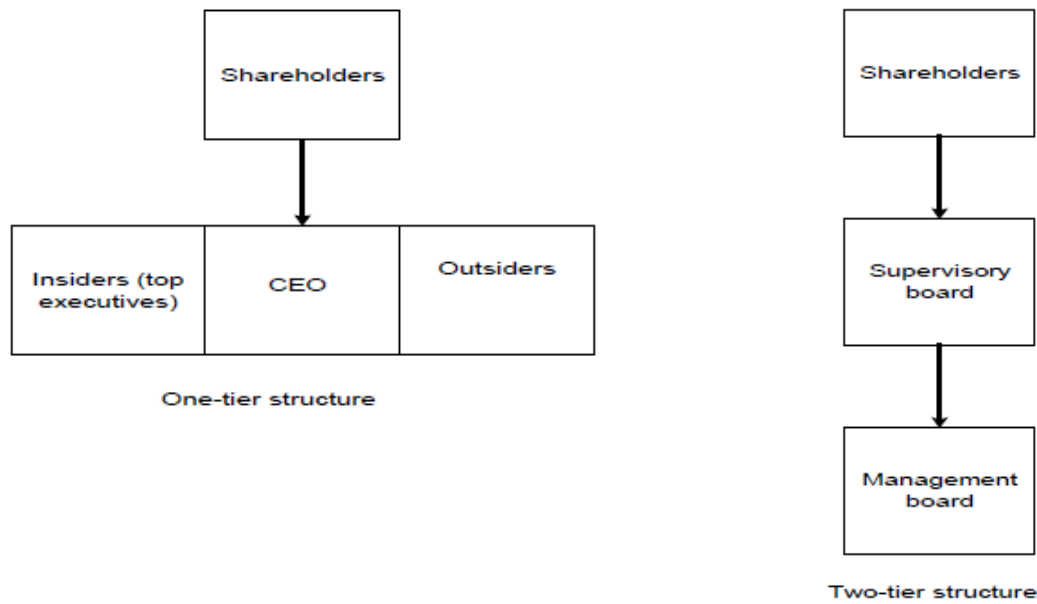


Fig. 1. One-tier board and two-tier board schematic representations (after Postma, van Ees (2001)).

Fig. 2 presents some information on the *operationalization of board functions* in Postma, van Ees (2001).

Board Functions: theoretical perspectives	Relevant aspects	Indicators
Interlocking function: - Resource dependency - Social networking	Interlocking Trust	Size of board Insiders/outside Background directors Reputation
Monitoring function: - Agency theory	Monitoring	Board compensation Board committees Insiders/outside CEO-duality
Strategic Function: - Strategic choice	Strategic discretion	Initiation of strategic dec. Evaluation/ratification

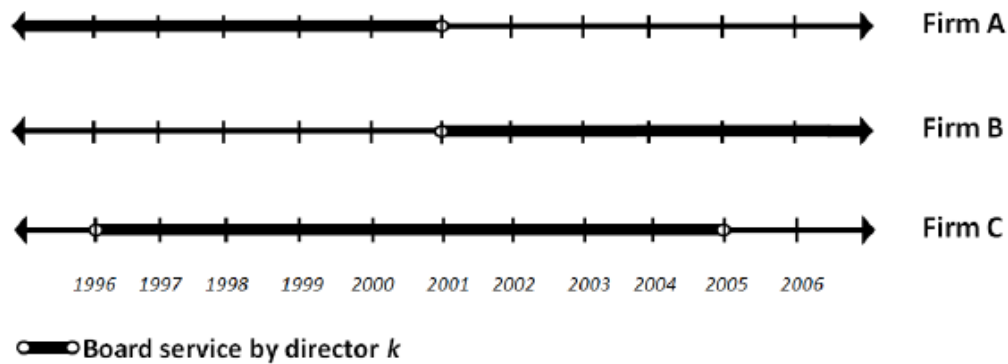
Fig. 2. Operationalization of board functions (after Postma, van Ees (2001)).

The *board of directors performs the governance of firm by formulating the business strategy to create, capture, deliver, sustain the value to the customers by designing the optimal business model and by linking the firm's business resources and capabilities to the competitive environment* in agreement with the research findings in Andrews (1971a, b, 1980, 1981a, b,

1984), Alexander, Goold, Collis, Campbell, Lieberthal, Montgomery, Palepu, Prahalad, Stalk, Khanna, Hart, Shulman, Evans (1992, 1995, 1996, 1997, 1998, 1999), Johnson, Scholes (1997), Johnson, Scholes, Whittington (1998, 2002, 2003), Fernandez (2007), Gavetti, Levinthal (2004), Gavetti, Rivkin (2007), Sull (2007a, b, c, d, 2008), Jacobides (2007), Kirkbride (2007), Murphy, Galunic (2007), Vermuelen (2008).

The *directors* can be elected or appointed to a *number of the boards of directors* in the *firms*, creating the ***interlocking interconnecting interlinking directors networks in the boards of directors in the firms***, which can be classified as a type of ***social networks*** in Malloy (2007), Ibara (2007), Ledenyov (2007).

Fig. 3 illustrates the *historical and contemporaneous directors interlocks* in the *boards of directors* in the *firms* in Rousseau, Stroup (2011).



Ordered pair	Historical Interlock	Contemporaneous Interlock
A to B	none	none
A to C	none	1997-2000
B to A	2003-	none
B to C	none	2002-2004
C to A	2003-2005	1997-2000
C to B	none	2002-2004

Fig. 3. *Historical and contemporaneous directors interlocks in boards of directors in firms* (after Rousseau, Stroup (2011)).

Let us review the *exact definitions* of the *interlocking interconnecting directors' networks* in the *boards of directors in the firms* as in the *academic literature*.

Postma, van Ees (2001) state: “The *interlocking function* of the *supervisory board* refers to the *institutional function of board structure*, indicating that *by increasing size and diversity of boards*, links to the external environment can be established and critical resources be secured, including prestige and legitimacy (Goodstein et al., 1994). Also from a *transaction cost*

economics point of view the board is reserved for those stakeholders who supply or finance firm specific assets (Williamson, 1996)."

Non, Franses (2007) state: "A director can hold several directorships in different firms. Such a director constitutes a link between the firms. Firms that are linked in this way are interlocked."

Rommens, Cuyvers, Deloof (November 2007) explain: "The resource dependence model sees interlocks as an organizational mechanism to co-opt other companies in an uncertain environment, so that each company depends on the other for resources. Information asymmetries and other uncertainties make corporate environments highly unpredictable, and interlocks may facilitate information flows between companies (e.g. Schoorman et al., 1981; Haunschild and Beckman, 1998, Gulati and Westphal, 1999). This information may include collusive information about competitors: interlocking directorates between competitors could therefore provide a means to distort competition, as competing firms may have common directors in order to strengthen collusive deals (e.g. Dooley, 1969; Schoorman et al., 1981; Gulati and Westphal, 1999). Interlocks may also be facilitators of information flows between companies and financial institutions and monitoring by financial institutions. Interlocks could thereby improve access to finance and lower the cost of finance (e.g. Richardson, 1987; Mizruchi and Stearns, 1994; Kroszner and Strahan, 2001; Santos and Rumble, 2006). However, financial institutions could abuse the control they exercise through interlocks by subordinating the interests of the company to their own interests (e.g. Richardson, 1987; Kroszner and Strahan, 2001)."

Santella, Drago, Polo, Gagliardi (2009) write: "There are several theories on the function of interlocking directorships. Mizruchi's (1997) comprehensive review on the topic illustrates three main reasons for the formation of interlocks: collusion, cooptation and monitoring, and legitimacy, career advancement, and social cohesion."

Pawlak M 2012 write: "Many executive (inside) directors and non-executive (outside) directors hold only one directorship, but others, particularly outside directors, hold more than one directorship. The situation in which one inside or outside director serves at the same time in two corporations is called an 'interlocking directorship', and this director is called an 'interlocking director'. Interlocking directorships (directorates) are more common in groups of outside directors, as they include a number of public and political figures who are recruited from other companies, and especially from the banking, insurance, and investment sectors (Scott John, 1991)."

Uddin (2012) writes: "Interlocking directorate is a loosely coupled inter-firm relationship. A direct interlock occurs when an executive or director of one firm sits on the

board of another firm, and an *indirect interlock* occurs when *two firms* have *directors* or *executives* who sit on the *board* of a *third firm*. Sharing innovation new idea, new approach, tacit knowledge, and overall cooperation are the motives behind joining in an *interlocking directorate*.”

Baccini, Marroni (September 2013): “An *interlocking directorates (ID)* occurs when a person sitting on the *board of directors* of a *firm* also sits on the *board of another firm*. According to Louis Brandeis (1933) “*the practice of interlocking directorates is the root of many evils. It offends laws human and divine. Applied to rival corporations, it tends to the suppression of competition*”. Others suggest that *ID* can be explained as the result of a strategic decision of *firms*, in view for example of monitoring sources of *environmental uncertainty*, and that the lack of direct evidence of *real anticompetitive effects* makes it difficult to elaborate a regulation (ABA, 1984; Schoorman et al., 1981). Indeed, the main trait of *ID* is ambiguity (Gerber, 2007). From a *competition policy perspective*, competing firms have to take their *business decisions* independently to avoid collusion and anticompetitive behaviour; *ID* may reduce or eliminate *competition* and facilitate collusion through the exchange of information (Gonzalez Diaz, 2012). Moreover, a same director sitting on the boards of competing firms may have an incentive to lessen competitive pressure amongst them (OFT, 2010; OECD, 2008). In contrast from a company perspective, *ID* can generate efficiencies, in terms of improving *business decisions* and, in some circumstances, *consumer and social welfare* (OFT, 2010; Mizruchi, 1996). In particular, *vertical interlocks* can facilitate *tying arrangements*, *vertical integration*, and *reciprocal or exclusive dealing* (OECD, 2008). As a consequence, *vertical ID* are considered benign for consumers, except in cases where *rivals* can be foreclosed, and therefore competition intervention scrutinizes *horizontal collusive ID* only (Gabrielsen et al. 2011).”

Let us provide the examples of *interlocking interconnecting directors’ networks in the board of directors in the firms* in Europe, North America and Asia as in the academic literature. Investigating the ***composition of the boards of directors in European firms***, it makes sense to note the observation in Loderer, Peyer (September 5 2001, 2002): “It is possible that *board overlap* occurs in part as a means for banks to *obtain new business* or *consolidate the existing one*. There is also evidence that *board overlap* occurs unintentionally as a consequence of the fact that *good directors* attract many mandates.” The *board of directors overlap problem* in the *Swiss firms* has been researched in Loderer, Martin (1997), Loderer, Peyer (September 5 2001, 2002), Perry, Peyer (September 2002, January 2005).

Fig. 4 shows a schematic illustration of the boards of directors overlap between the two firms, which is a number of directors they have in common, in *Loderer, Peyer (September 5 2001, 2002)*.

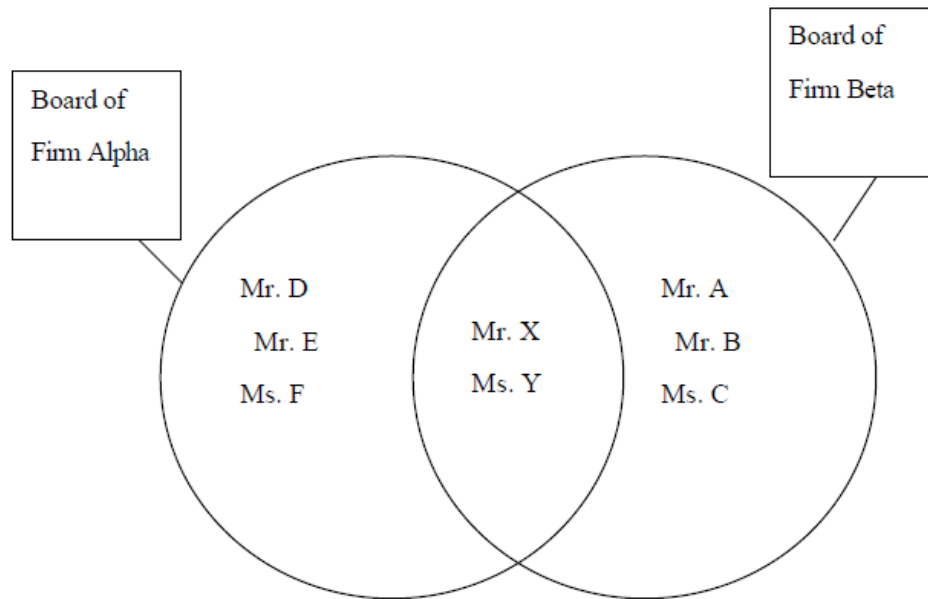


Fig. 4. Schematic illustration of boards of directors overlap (after *Loderer, Peyer (September 5 2001, 2002)*).

Tab. 1 Provides the examples of boards of directors overlaps in Switzerland in *Loderer, Peyer (September 5 2001, 2002)*.

	Rainer E. Gut COB of Credit Suisse Holding	Helmut Maucher COB of Nestlé	Pierre Borgeaud COB of Sulzer AG	Nikolaus Senn COB of Union Bank of Switzerland	Peter Spälti COB of Winterthur Versicherungen
Credit Suisse Holding	*	*			
Nestlé	*	*			
Sulzer AG			*		*
Union Bank of Switzerland				*	*
Winterthur Versicherungen			*	*	*

Tab. 1. Examples of boards of directors overlaps in Switzerland (after *Loderer, Peyer (September 5 2001, 2002)*).

Tab. 2 demonstrates the descriptive statistics of *Swiss* firms listed on the *Zurich Stock Exchange* in *Loderer, Peyer (September 5 2001, 2002)*.

	1980	1985	1990	1995
Panel A: All sample firms				
Number of firms	92	102	162	169
Median market value of equity (millions of Swiss francs)	121	285	326	439
Median board size	9	8	8	7
Average board size	10.5	10.1	9.5	8.5
Mean comparison test, t-statistics		-0.49	-0.95	-1.94
Average board overlap	9.7	9.6	9.2	6.4
Mean comparison test, t-statistics		-0.03	-0.31	-2.90
Average fraction of outside directors per firm	79.4%	78.6%	73.6%	76.5%
Panel B: Surviving firms (66)				
Median market value of equity (millions of Swiss francs)	181	267	529	632
Average board size	10.1	9.9	10.2	9.3
Mean comparison test, t-statistics		-0.2	0.27	-0.97
Average board overlap	11.2	11.5	13.4	9.5
Mean comparison test, t-statistics		0.14	0.92	-2.07
Average fraction of outside directors per firm	77.5%	76.9%	74.6%	76.1%

Tab. 2. *Descriptive statistics of Swiss firms listed on the Zurich Stock Exchange. Panel A displays statistics for all sample firms. Panel B contains only the 66 firms that are listed in all four sample years (surviving firms) (after Loderer, Peyer (September 5 2001, 2002)).*

Tab. 3 depicts the board of directors overlap in the 25 largest and the 25 smallest firms in *Loderer, Peyer (September 5 2001, 2002)*.

	1980	1985	1990	1995
Panel A: Largest firms (25)				
Median market value of equity (millions of Swiss francs)	1,292	1,871	4,150	5,803
Average board size	14.2	14.1	13.1	11.3
Average board overlap with other large firms	14.5	12.6	10.8	4.7
Average board overlap with sample firms in general	23.5	23.0	25.6	18.5
Panel B: Smallest firms (25)				
Median market value of equity (millions of Swiss francs)	36	41	53	44
Average board size	8.0	7.7	6.6	6.2
Average board overlap with other small firms	0.92	0.32	0.56	0.08
Average board overlap with sample firms in general	4.48	3.68	4.76	2.84

Tab. 3. *Board overlap in the 25 largest and the 25 smallest firms. Panel A contains statistics on the 25 largest firms listed on the Zurich Stock exchange in each of the four sample years. Panel B contains statistics on the 25 smallest firms listed on the Zurich Stock exchange in each of the four sample years (after Loderer, Peyer (September 5 2001, 2002)).*

Tab. 4 reports the board overlap statistics in the internationally vs. domestically oriented firms in Loderer, Peyer (September 5 2001, 2002)).

	1990	1995
Panel A: Internationally oriented firms		
Number of firms	88	98
Median market value of equity (millions of SFr.)	513	677
Average board size	9.6	8.6
Average board overlap	11.7	7.8
Panel B: Domestically oriented firms		
Number of firms	74	71
Median market value of equity (millions of SFr.)	130	153
Average board size	9.3	8.3
Average board overlap	6.3	4.4
Comparison tests internationally oriented vs. domestically oriented: t-statistics		
Board size	0.30	0.39
Board overlap	3.36	3.02

Tab. 4. Board overlap in internationally vs. domestically oriented firms. Internationally oriented firms have sales outside Switzerland that exceed 20% of total sales.
(after Loderer, Peyer (September 5 2001, 2002)).

Tab. 5 provides the information on the banks and the boards of directors overlap for the firms listed on the Zurich Stock Exchange in Switzerland.

	Banks	Total sample	
	(1)	(2)	(1)/(2)
1980			
Directors	203	714	28.4%
Board overlap	300	445	67.4%
1985			
Directors	214	761	28.1%
Board overlap	328	491	66.8%
1990			
Directors	321	1,111	28.9%
Board overlap	424	747	56.8%
1995			
Directors	227	1,093	20.1%
Board overlap	208	539	38.6%

Tab. 5. Banks and board overlap. Descriptive statistics for firms listed on the Zurich Stock Exchange. Columns (1) and (2) show number of directors and board overlap observed in the subsample of banks and in the total sample, respectively. The last column shows the ratio of the numbers in columns (1) and (2) (after Loderer, Peyer (September 5 2001, 2002)).

It is necessary to mention that there are multiple evidences of presence of the *board of directors overlaps* in the *Swiss firms*. For example, discussing the *Swatch Group* in the *Swiss watch industry*, Donzé (2011) writes: “In 1983, the various companies were grouped together into three sub-holdings, depending on their type of activity (complete watches; movements and parts; other), and initially characterized by rationalization. This policy was directed by a four-member *Executive Management Board*. Chaired by *Pierre Arnold*, CEO of the *Migros* chain store and a *member of several Boards of Directors (CFF, Swissair)*, it also included three division managers from both merged companies (*Ernest Thomke* for watch production, *Andor Helti* for high-tech and *Carl M. Meyer* for finances). This *board* worked under the supervision of *Nicolas G. Hayek*, who was engaged until 1986 as a special adviser to the *Board of Directors*, and went on to become the real seat of power within *SG*.” Therefore, it can be evidently seen that the practice, when the *directors take a number of seats in the boards of directors in the Swiss firms* is well spread.

The *interlocking directorships* in the *Italian listed companies in Italy in 1998 – 2006* have been researched in *Santella, Drago, Polo (November 11 2007)*, where it was shown that a high percentage of the *Italian listed companies* are connected with each other through an *interlinking networks of directors*. The highest level of connectivity among the *interlocking directors* is observed in the *boards of directors* in the *Italian Blue Chips*. *Santella, Drago, Polo (November 11 2007)* demonstrate that all the financial *Italian Blue Chips* are continuously connected with each other through an *interlinking network of directors* in the researched period of time from 1998 to 2006.

Santella, Drago, Polo (November 11 2007) highlight the following reasons for the *interlocking directors networks* formation: *collusion, cooptation, monitoring, legitimacy, career advancement, and social cohesion*. *Santella, Drago, Polo (November 11 2007)* write: “The *idea* is that *firms* invite on their *board* representatives of the various resources they depend on to reduce environmental uncertainty and maintaining their position in the market. For this reason companies have on their boards bankers, suppliers, clients (*Pfeffer e Salancik, 1978*). As regards monitoring, information theories hold that there are *information asymmetries between creditors and debtors, since creditors*, that is banks, know less about the quality of debtors. *Interlocking* is one of those institutions that can help surmount *information asymmetry (Mariolis, 1975)*. Its function is to monitor debtors by offering access to internal information. Through membership in directorates and boards banks are able to keep the company management under their influence. *Dooley (1969)* finds that less solvent firms are likely to be interlocked with banks. Later studies also report that firms with high debt-to-equity ratios (*Pfeffer, 1972*) or organizations with an

increased demand for capital (*Mizruchi and Stearns, 1988*) have a higher tendency to interlock their boards. The quest for legitimacy is a further source of interlocking (*Selznick, 1957*). In order to better their reputation firms invite on their boards individuals with ties to important organizations.”

In addition, *Santella, Drago, Polo (November 11 2007)* explain: “Moving from a *firm perspective* to an *individual director perspective*, that is from a *demand perspective* to a *supply perspective*, *Zajac (1988)* states that one reason for *interlocks* is the fact that *individuals join boards for financial remuneration, prestige, and contacts that may prove useful in securing subsequent employment opportunities*. Furthermore, according to *Useem (1984)*, *interlocks* are a tool to promote upper-class cohesion creating a *business elite*. Such incentives for *directors* to assume *multiple directorships* might have negative consequences. According to *Ferris et al. (2003)* and *Fich and Shivdasani (2006)*, *multiple directorships place an excessive burden on directors with a negative impact on their ability to monitor and influence managers* (business hypothesis).”

As far as the interlocking directors networks in the firms in *Italy* is concerned, *Santella, Drago, Polo (November 11 2007)* make the following conclusions: “We find that about 94% of all sampled *directors* sit on *one or two boards* in every one of the nine years considered. We observe that it is difficult for such *directors* to move to *three or more directorships*. We then explore the features of those *directors* who have more than *two directorships* at any given year and therefore ensure the bulk of the connectivity among the *Italian listed companies*. We find a group of 75 directors out of a total of 4270 directors who over the nine years considered have at least 23 directorships (on average about 2.5 every year). We define them for brevity the *Lords of the Italian stock market*. They are overwhelmingly male (just three female directors among the 75 *Lords*) and in an important number of cases they are *Chairmen* or *CEOs*; one third of them are also significant *shareholders* in one or more listed companies. Starting from the observation that *Lords* tend to belong to *families of directors*, we find 53 *families* that add up at least to 23 *directorships* in *nine* years. The *first five families* have more than 100 *directorships* and the *first ten* have a *higher number of directorships* than the first *Lord*.”

Tab. 6 shows a review of literature on the *interlocking directors* in the *board of directors* in the *firms* in Santella, Drago, Polo (November 11 2007).

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

Tab. 6. *The function of interlocks. Review of the empirical evidence (after Santella, Drago, Polo (November 11 2007)).*

Tab. 7 informs on the positive and negative impacts of *interlocking directors* in the *board of directors* in the *firms* in Santella, Drago, Polo (November 11 2007).

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

Tab. 7. *Positive and negative impacts of interlocking directors in the board of directors in the firms (after Santella, Drago, Polo (November 11 2007)).*

Tab. 8 shows the literature on *interlocking directors* in *Santella, Drago, Polo (Nov 2007)*.

Country/year	Author	Results	Methodology
Australia (1976/1996)	Malcolm (2003)	"The interpersonal network of 1996 is broader, more cohesive and more densely connected than that of 1976. However, there is only minimal change in the density of intercorporate linkages over these two decades."	Network analysis (directors)
Canada	Ornstein (2003)	"The Canadian network is neither unusually sparse nor fragmented; there is no pronounced cleavage between, or subordination of, non-financial corporations to financial corporations; nor do the foreign-controlled corporations constitute an alternative centre or fragment of the network. It resembles the networks of countries such as Germany and France"	
Europe (2000/2001/2002/2003)	Guieu Meschi (2006)	"La base de regroupement reste largement nationale, les liens internationaux n'ayant aucunement de caractère systématique. Si liens internationaux il y a, ces liens restent sporadiques, centrés sur quelques individus. Un administrateur peut être international (comme c'est le cas par exemple de B. Collomb, de M. Treschow ou d'A. Bertheim), les réseaux le sont peu"	Network analysis, Descriptives
Europe/Various countries	Rodriguez, Cárdenas, Oltra (2003)	"Existe claramente una Europa de poder económico multinacional y un espacio económico multinacional que son el resultado de la acción de un reducido grupo de propietarios internacionales."	
Europe/ Various countries	Rodriguez, Cárdenas, Oltra (2003)	"We can point to some different models of class and power"	
France (1996/2000)	Chabi, Maati (2005)	Existence of a Small world.	Matching Small World phenomenon
France (1996/2005)	Elouaer (2005)	Centrality of financial institutions. Big companies tend to be more central. "Less dense network in 2005".	Network analysis (directors and companies)
FTSE 100 (2005)	Maati (2007)	Existence of a Small world	Matching Small World phenomenon
Germany (1989/2001)	Heinze (2004)	"Qualitative dissolution of interlocking directorates"... This process of quantitative erosion did not yet affect considerably structural properties of the networks". Centrality of financial institutions.	Network analysis
Ireland	Mac Canna, Brennan, O'Higgins (1998)	"Network of interlocking directorates is in some way structured, and not the result of random processes... Irish boards were found to have a relatively loosely connected network structure which is sparser and less dense than those of other countries. This is reflected in the relatively low percentage of multiple directors and the relatively fewer number of directorships per multiple director. In general, indigenous Irish public companies tended to be central in the network, while a disproportionately large number of foreign and private companies were isolated on the periphery. However, a number of foreign-owned companies were central to the network"	Matching Small World phenomenon
Italy (1952/1960/1972)	Rinaldi Vasta (2005)	"In 1952 and 1960, the system, centred on the larger electrical companies, showed the highest degree of cohesion. This centre dissolved after the nationalisation of the electricity industry in 1962 and was replaced by a new and less cohesive one, hinged on financial intermediaries: banks, insurance and finance companies. More generally, contrary to conventional wisdom, we argue that banks maintained an important role throughout the period investigated"	Descriptives

Italy (1970/1990)	Aguilera (2006)	Overall static structure (1970-1990). Existence of a small world	Network analysis Matching Small World phenomenon.
Italy (1983/1998)	Barbi (2000)	"A decreasing trend in overlapping membership in order to support block-holders is given by a decrease in density as well as by an increase in the asymmetry of links distribution"	Network analysis/Concentration analysis
Italy (1990/2000)	Corrado Zollo (2006)	"Stability of Small World coefficients". Fragmentation of the system. Relative stability of the key players.	Network analysis (Ownership network)
Italy (2004)	Carbonai Di Bartolomeo (2006)	"The Italian insurance industry is characterized by a low degree of competition. This paper provides some evidence to the idea that the absence of competition is due to a violation of a basic assumption"	Graph Theory, Principal Component Analysis (interlocking directors Insurance companies)
Italy (1999/2000/2001/2002/2003/2004)	Bertoni Randone (2006)	Existence of a Small World	Matching Small World phenomenon (Company and Ownership networks)
Italy (2004)	Casaleggio (2004)	Existence of a Small World	
Italy (2006)	Murgia (2006)	Higher level of companies isolates. Higher percentages of multiple directorships.	Network analysis (IT directors companies in Lazio)
Netherlands (1960/1964/1969/1972/1976/1980)	Stokman et al (1990)	Reducing interlocks per multiple director. Increasing the density of the network.	Network descriptive statistics
New Zealand (2004)	Stablein et. al. (2004)	Existence of a Small World	Matching Small World phenomenon
Singapore (1997)	Ong, Chin Huat, Wan, David and Ong, Kee-Sing (2003)	Firm size correlated with interlocking directorships. Financial companies share an higher level of interlocks with not financial companies	Network explorative analysis
Singapore (2005)	Conyon Muldoon (2006)	Existence of a Small World	Matching Small World phenomenon
Spain (1970/1990)	Aguilera (2006)	Large changes over the time (1970-1990). Existence of a small world	Network analysis. Matching Small World phenomenon
USA	Davis Yoo et Baker (2002)		
USA (1982,1990,1999)	Davis Yoo et Baker (2003)	Stability of the aggregate connectivity. Existence of a small world	Network analysis. Matching Small World phenomenon
USA (1990,2001)	Davis Yoo et Vast (2003)	Existence of a small world in 1990 and 2001)	Matching Small World phenomenon

Tab. 8: Detailed information on published literature on interlocking directors in board of directors in firms in various countries (after Santella, Drago, Polo (November 11 2007)).

Tab. 9 gives some data on a *number of directorships* by a *director* in the *board of directors* in the *Italian listed firms* in 1998-2006 in Santella, Drago, Polo (November 11 2007).

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

Tab. 9. A number of directorships by director in board of directors in Italian listed firms in 1998-2006 (after Santella, Drago, Polo (November 11 2007)).

Tab. 10 shows the *directors* with more than 23 *directorships* in the *board of directors* in the *Italian listed firms* in nine years (1998-2006) in Santella, Drago, Polo (November 11 2007).

COGNOME NOME	1998	1999	2000	2001	2002	2003	2004	2005	2006	Total
GRANDE STEVENS FRANZO	7	8	8	8	7	8	7	6	4	63
EREDE SERGIO	8	10	9	5	5	5	5	6	7	60
PESENTI GIAMPIERO	8	7	7	6	6	6	6	5	4	55
BENETTON GILBERTO	3	3	4	8	9	8	7	6	6	54
DE BENEDETTI CARLO	5	7	7	6	6	6	6	6	4	53
TRONCHETTI PROVERA MARCO	6	9	8	9	6	4	4	4	3	53
MION GIANNI	3	3	3	8	9	7	8	5	5	51
PESENTI CARLO	3	5	6	4	6	6	6	6	6	48
GUATRI LUIGI	4	4	4	5	6	6	6	6	5	46
BUORA CARLO	2	3	3	6	9	7	7	6	2	45
CARLEVARIS CARLO	5	5	5	5	5	5	5	5	5	45
GALATERI DI GENOLA E SUNIGLIA GABRIELE	6	6	6	5	3	4	4	6	5	45
GIRARD FRANCO ROBERTO	5	5	5	5	5	5	5	5	4	44
DELFINI MARIO	4	3	5	5	5	5	5	5	5	42
PURI NEGRI CARLO ALESSANDRO	3	4	3	5	7	6	5	5	4	42
ROCCA GIANFELICE	4	4	5	4	5	5	5	5	4	41
DE BENEDETTI RODOLFO	4	5	4	4	4	4	5	5	4	39
PIRELLI ALBERTO	4	3	4	5	6	4	4	4	4	38
BAZOLI GIOVANNI	5	4	4	4	4	4	4	4	4	37
BENETTON ALESSANDRO	3	5	6	4	4	4	4	4	2	36
COLOMBO UMBERTO	4	5	5	5	5	5	4	3		36
FALCK ALBERTO	8	8	8	6	6					36
GRECO MARIO	1	1	3	5	6	6	5	3	5	35
SEGRE MASSIMO	2	3	3	3	4	4	4	6	6	35
LIGRESTI JONELLA	2	2	2	3	3	5	6	6	5	34
LUCCHINI GIUSEPPE	5	5	4	4	4	4	4	2	2	34
MOLINARI AMATO LUIGI	3	3	2	3	4	5	5	6	3	34
RUOZI ROBERTO	2	3	3	3	4	4	4	6	5	34
GUTTY GIANFRANCO	7	7	7	6	2	2		1	1	33
PECCI ALBERTO	5	6	5	4	2	2	3	3	3	33
VITALE MARCO	2	2	3	4	5	5	4	4	4	33
SAVIOTTI PIERFRANCESCO	4		3	5	5	4	4	3	4	32
COLANINNO ROBERTO	3	6	6	2	1	3	3	3	4	31
D'URSO CARLO	3	3	3	3	4	4	3	4	4	31
FERRERO PIERLUIGI	2	3	3	4	4	4	4	4	3	31
CEFIS GIORGIO CAMILLO MARCELLO	4	5	5	4	4	2	2	2	2	30
ORLANDO LUIGI	6	5	5	5	5	3	1			30
TAMBURINI MATTEO		2	4	3	3	4	4	5	5	30
ZANON DI VALGIURATA LUCIO IGINO	4	4	4	3	3	3	3	3	2	29
FABRIZI PIER LUIGI	2	3	3	5	5	3	3	3	1	28
LIGRESTI GIULIA MARIA	1	1	1	2	3	5	5	5	5	28
BERLUSCONI MARINA ELVIRA	3	3	3	3	3	3	3	3	3	27
CATTANEO MARIO	2	3	3	3	3	4	4	3	2	27
CLO' ALBERTO	1	2	2	2	2	3	5	5	5	27
DALLOCCIO MAURIZIO	1	1	2	3	3	4	5	6	2	27
MARZOTTO PIETRO	6	5	4	4	4	3	1			27
ACUTIS CARLO	2	2	2	2	2	3	4	4	5	26
BERNHEIM ANTOINE	2	2	2	2	2	3	3	4	4	26
CALTAGIRONE FRANCESCO	4	3	2	2	2	3	3	3	4	26
LIGRESTI GIOACCHINO PAOLO	1	1	1	2	2	7	4	4	4	26
PERISSINOTTO GIOVANNI		1	1	2	3	4	5	5	5	26
SOZZANI VINCENZO	6	4	3	2	3	3	3	2		26
GAZZONI FRASCARA GIUSEPPE	6	5	4	3	1	1	2	2	1	25
MAJORE ALBINO	2	2	3	3	3	3	3	3	3	25
MINUCCI ALDO	1	2	3	3	3	3	3	3	4	25
NATTINO GIAMPIETRO	3	2	1	3	4	3	3	3	3	25
REBOA MARCO	1	2	2	2	2	4	4	4	4	25
BIANCHI TANCREDI	3	4	5	5	2	2	1	1	1	24
BONDI ENRICO	5	6	4	4	3			1	1	24
CIPOLLETTA INNOCENZO	3	3	2	4	3	2	3	2	2	24
FAVRIN ANTONIO	1	1	1	2	3	4	4	5	3	24
GERONZI CESARE	2	3	3	3	3	2	3	3	2	24
MARTINELLI FELICE	1	2	3	3	3	3	3	3	3	24
RIPA DI MEANA VITTORIO	3	3	3	3	5	2	2	2	1	24
ROSA UMBERTO	3	3	1	1	2	2	4	4	4	24
SCIUME' PAOLO	3	3	3	3	3	3	2	2	2	24
TEODORANI FABBRI PIO	2	2	2	3	3	3	3	3	3	24
ARCELLI MARIO	4	4	4	4	4	3				23
BRUNETTI GIORGIO	2	2	2	3	3	3	2	3	3	23
CALTAGIRONE FRANCESCO GAETANO	1	1	2	3	3	4	3	3	3	23
FERRERO CESARE	1	1	1	4	4	4	3	3	2	23
MARAMOTTI ACHILLE	3	3	3	5	3	3	3			23
MARCHIO' ANGELO	6	6	7	2	1	1				23
PININFARINA ANDREA	3	3	2	2	3	2	3	3	2	23
RONDELLI LUCIO	4	4	5	2	2	1	1	2	2	23

Tab. 10. Directors with more than 23 directorships in board of directors in Italian listed firms in nine years (1998-2006) (after Santella, Drago, Polo (November 11 2007)).

Tab. 11 displays the characteristics of *interlocking directorship network of top 100 companies in Italy in 2010 in Baccini, Marroni (September 2013)*.

Label	Company	Degree	All Closeness centrality	Normalized all degree	Betweenness centrality
1	A2A	6	0,350	0,061	0,015
2	Acea	4	0,345	0,040	0,003
3	Amplifon	5	0,327	0,051	0,015
4	Ansaldo Sts	4	0,337	0,040	0,023
5	Ascopiave	4	0,291	0,040	0,004
6	Astaldi	1	0,249	0,010	-
7	Atlantia	19	0,458	0,192	0,062
8	Autogrill	11	0,412	0,111	0,015
9	Autostrada TO-MI	7	0,345	0,071	0,010
10	Azmut Holding	2	0,292	0,020	-
11	Banca Carige	4	0,346	0,040	0,004
12	Banca Generali	8	0,387	0,081	0,010
13	Banca Intermobiliare	2	0,284	0,020	0,002
14	Banca MPS	3	0,336	0,030	0,001
15	Banca Popolare di Sondrio	3	0,319	0,030	0,002
16	Banca Popolare Emilia Romagna	3	0,257	0,030	0,003
17	Banca Popolare Milano	9	0,356	0,091	0,025
18	Banco di Desio e Brianza	1	0,289	0,010	-
19	Banco Popolare	7	0,346	0,071	0,024
20	Benetton Group	8	0,395	0,081	0,003
21	Beni stabili	6	0,375	0,061	0,008
22	Buzzi Unicem	3	0,313	0,030	0,002
23	Cairo Communication	0	-	-	-
24	Campari	3	0,299	0,030	0,003
25	Cattolica Assicurazioni	2	0,304	0,020	0,000
26	Cementir Holding	3	0,312	0,030	0,001
27	Cir	10	0,383	0,101	0,025
28	Cofide	8	0,380	0,081	0,014
29	Credito Artigiano	5	0,360	0,051	0,020
30	Credito Bergamasco	1	0,254	0,010	-
31	Credito Emiliano	2	0,287	0,020	0,001
32	Credito Valtellinese	5	0,313	0,051	0,006
33	Danieli & Co.	3	0,326	0,030	0,003
34	Datalogic	5	0,312	0,051	0,032
35	De' Longhi	11	0,390	0,111	0,062
36	Dea Capital	8	0,390	0,081	0,021
37	Diasorin	2	0,263	0,020	-
38	Edison	4	0,307	0,040	0,004
39	Enel	2	0,290	0,020	0,001
40	Enel Green Power	1	0,312	0,010	-
41	Engineering	2	0,316	0,020	0,000
42	Eni	12	0,421	0,121	0,020
43	Erg	0	-	-	-
44	Exor	7	0,369	0,071	0,023
45	Falck Renewables	5	0,324	0,051	0,012
46	Fiat	10	0,399	0,101	0,043
47	Fiat Industrial	9	0,406	0,091	0,010
48	Fondiana-Sai	12	0,417	0,121	0,021
49	Gas Plus	3	0,319	0,030	0,005
50	Gemina	9	0,392	0,091	0,027
51	Generali	19	0,451	0,192	0,064
52	GEOX	1	0,312	0,010	-
53	Gruppo Ed. L'Espresso	13	0,408	0,131	0,034
54	Hera	3	0,249	0,030	0,000
55	IGD	3	0,276	0,030	0,005
56	IMA	2	0,251	0,020	0,002
57	Impregilo	8	0,372	0,081	0,024
58	Indesit Company	5	0,353	0,051	0,001
59	Interpump Group	10	0,393	0,101	0,033
60	Intesa San Paolo	11	0,415	0,111	0,032
61	Iren	6	0,333	0,061	0,007
62	Italcementi	14	0,440	0,141	0,051
63	Italmobiliare	12	0,413	0,121	0,028
64	Lottomatica	4	0,331	0,040	0,005
65	Luxottica Group	19	0,453	0,192	0,097
66	Maire Tecnimont	2	0,312	0,020	-
67	Marcolin	5	0,356	0,051	0,003
68	Marr	3	0,297	0,030	0,009
69	Mediaset	9	0,402	0,091	0,011
70	Mediobanca	22	0,483	0,222	0,103
71	Mediolanum	7	0,382	0,071	0,035
72	Milano Assicurazioni	8	0,397	0,081	0,012
73	Mondadori Editore	12	0,408	0,121	0,030
74	Nice	2	0,281	0,020	-
75	Parmalat	13	0,431	0,131	0,053
76	Piaggio & Co.	9	0,369	0,091	0,016
77	Pirelli & Co.	25	0,463	0,253	0,116
78	Prysmian	7	0,393	0,071	0,011
79	RCS Mediagroup	19	0,458	0,192	0,058
80	Recordati	0	-	-	-
81	Safilo Group	0	-	-	-
82	Saipem	5	0,343	0,051	0,023
83	Salvatore Ferragamo	1	0,298	0,010	-
84	Saras	6	0,378	0,061	0,003
85	Save	0	-	-	-
86	Sias	2	0,286	0,020	-
87	Snam rete gas	1	0,253	0,010	-
88	Sogefi	3	0,311	0,030	-
89	Sol	2	0,271	0,020	-
90	Sorin	6	0,360	0,061	0,022
91	Telecom	17	0,456	0,172	0,071
92	Telecom Italia Media	4	0,326	0,040	0,003
93	Terna	6	0,359	0,061	0,008
94	Tod's	7	0,364	0,071	0,012
95	Trevi Fin Industriale	3	0,285	0,030	0,007
96	UBI Banca	8	0,393	0,081	0,017
97	Unicredit	8	0,397	0,081	0,032
98	Unipol	4	0,318	0,040	0,029
99	Yoox	1	0,236	0,010	-
100	Zignago Vetro	5	0,330	0,051	0,008

Tab. 11. The characteristics of *interlocking directorship network of top 100 companies in Italy in 2010 (after Baccini, Marroni (September 2013))*.

Fig. 5 shows the *interlocking directorship network* of the *top 100 companies in Italy* in 2010 in *Baccini, Marroni (September 2013)*.

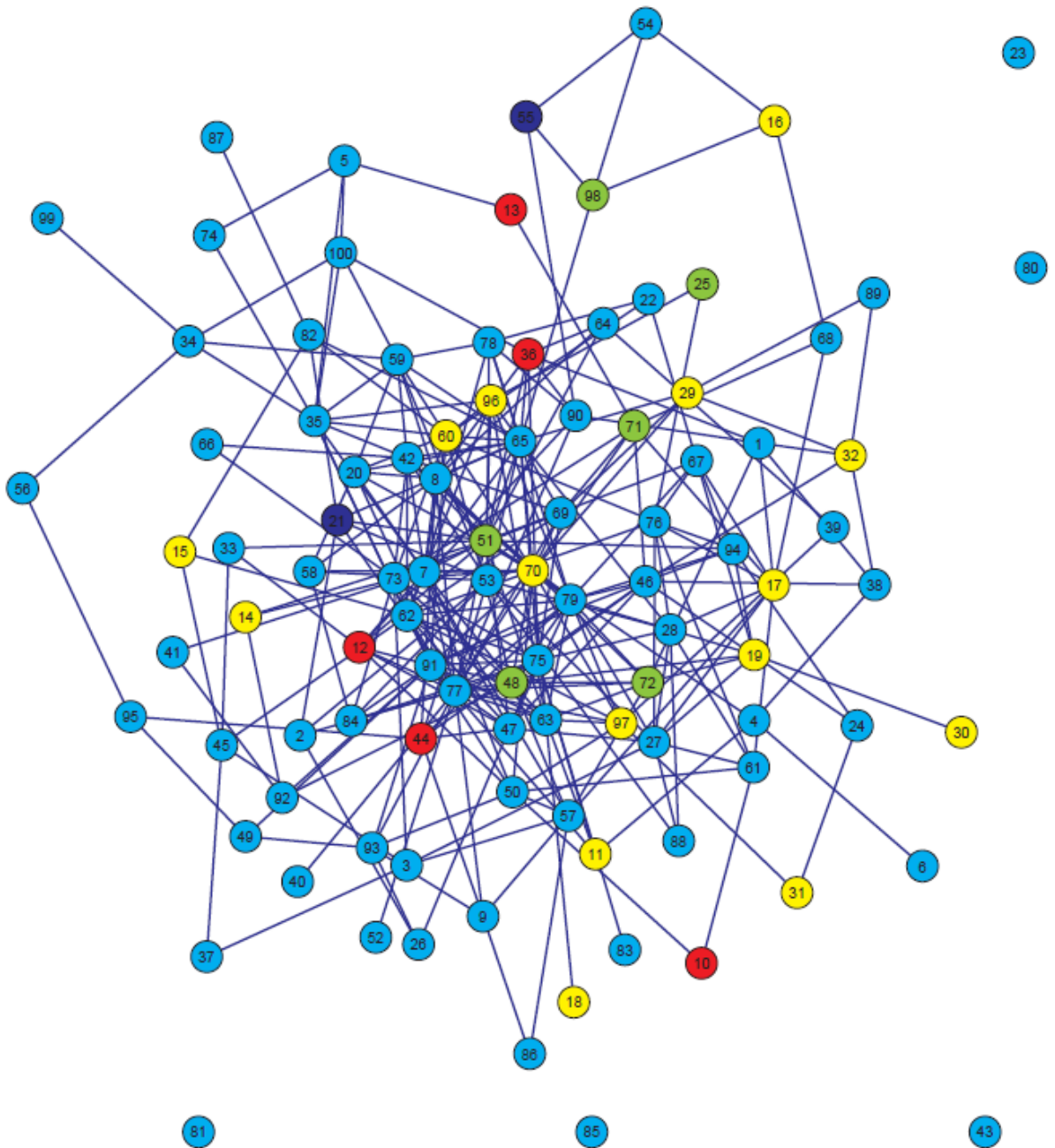


Fig. 5. *The interlocking directorship network of the top 100 companies in Italy in 2010. Yellow color denotes the directorships from financial industry (after Baccini, Marroni (September 2013)).*

Analyzing the *composition of the boards of directors in the North American firms*, we would like to attract an attention to the research on the *interlocking directorship network of the top 100 companies in the USA in Baccini, Marroni (September 2013)*.

Baccini, Marroni (September 2013) explain: “Concerns regarding *monopoly* and *big companies* were widespread at the beginning of the twentieth of century in the *U.S.* and as a consequence *ID* became a hot political issue. In *1908* the *Democratic Party platform* proposed a law to prohibit it, and in *1912* the platforms of all three national parties called for *ID legislation* to supplement the *Sherman Act*. In the build-up of the legislation, two committees investigated and documented the extent of *interlocking directorates*. *Brandeis*, an influential advisor to *President Woodrow Wilson*, published articles highly critical of the practice (*1915*). The issues raised by these committees and commentators were broader: they concerned *collusion*, *information exchange* and *conflicts of interest*. Policy proposals were directed toward the prohibition of almost any kind of interlock (*Travers, 1968*). Congress approached the problem of *ID* selectively, limiting both the classes of corporations and the kinds of *ID* subject to regulation (*ABA, 1984*); and in fact *Section 8* of the *Clayton Act*, enacted in *1914* and still effective today, prohibits *ID* for competing corporations larger than a certain size (*Waller, 2011*). *Congress* also decided to leave the regulation of conflict of interest of the *boards of directors* and other concerns to state fiduciary duty laws, the securities laws of the *1930s*, and to other legislation. Revisions to *Section 8* followed quickly upon the statute's *1914* passage, but the most significant changes took place in the last quarter of the *XXth* century. In *1978* *Congress* enacted the *Depository Institution Management Interlocks Act (1978)* to discipline *bank interlocks* and expanded the role of agencies to grant exemption. The exclusion of *banks* represented a significant break in the history of *Section 8*: substantial portions of earlier versions of *Section 8* had dealt with *banking interlocks*, and many of the early amendments to the *Section* focused exclusively on modifying the banking provisions of the act. In *1990* a modification excluded relatively small companies from coverage under the law. Current wording of this rule prohibits any person from serving as a director and officer “*in any two corporations (...) that are (...) by virtue of their business and location of operation, competitors, so that the elimination of competition by agreement between them would constitute a violation of any of the antitrust law*” (*United States Code, 2013*).”

Tab. 12 demonstrates the characteristics of *interlocking directorship network* of *top 100 companies* in the *USA* in *2011* in *Baccini, Marroni (September 2013)*.

Label	Company	Degree	All Closeness centrality	Normalized all degree	Betweenness centrality
1	3M Co.	8	0,324	0,081	0,054
2	Abbott Laboratories	6	0,273	0,061	0,041
3	Altria Group Inc.	0	-	-	-
4	Amazon.com Inc.	1	0,193	0,010	-
5	American Express Company	6	0,302	0,061	0,039
6	American International Group, Inc.	3	0,239	0,030	0,004
7	Amgen Inc.	4	0,273	0,040	0,004
8	Anadarko Petroleum Corporation	1	0,163	0,010	-
9	Apache Corp.	0	-	-	-
10	Apple Inc.	4	0,268	0,040	0,005
11	AT&T, Inc.	4	0,255	0,040	0,072
12	Baker Hughes Incorporated	3	0,234	0,030	0,052
13	Bank of America Corporation	2	0,240	0,020	0,001
14	Baxter International Inc.	0	-	-	-
15	Berkshire Hathaway Inc.	5	0,255	0,051	0,029
16	BlackRock Inc.	3	0,221	0,030	0,019
17	Boeing Co.	10	0,337	0,101	0,091
18	Bristol-Myers Squibb Company	0	-	-	-
19	Carnival Corporation	0	-	-	-
20	Caterpillar Inc.	4	0,283	0,040	0,014
21	Chevron Corporation	8	0,296	0,081	0,051
22	Cisco Systems, Inc.	2	0,213	0,020	0,004
23	Citigroup Inc.	4	0,265	0,040	0,031
24	Colgate-Palmolive Co.	2	0,221	0,020	0,007
25	Comcast Corporation	2	0,223	0,020	0,005
26	ConocoPhillips	5	0,279	0,051	0,031
27	Coming Inc.	4	0,248	0,040	0,029
28	Costco Wholesale Corporation	2	0,216	0,020	-
29	CVS Caremark Corporation	0	-	-	-
30	Danaher Corp.	0	-	-	-
31	Deere & Company	5	0,289	0,051	0,028
32	Dell Inc.	4	0,252	0,040	0,009
33	Devon Energy Corporation	1	0,185	0,010	-
34	DIRECTV	2	0,241	0,020	-
35	eBay Inc.	4	0,249	0,040	0,012
36	El DuPont de Nemours & Co.	4	0,247	0,040	0,011
37	Eli Lilly & Co.	7	0,290	0,071	0,040
38	EMC Corporation	1	0,186	0,010	-
39	Emerson Electric Co.	1	0,198	0,010	-
40	Express Scripts Inc.	1	0,215	0,010	-
41	Exxon Mobil Corporation	6	0,298	0,061	0,042
42	Ford Motor Co.	4	0,251	0,040	0,025
43	Freeport-McMoRan Copper & Gold Inc.	3	0,200	0,030	0,035
44	General Electric Co.	7	0,302	0,071	0,056
45	Gilead Sciences Inc.	2	0,250	0,020	0,004
46	Google Inc.	2	0,198	0,020	0,001
47	Halliburton Company	1	0,153	0,010	-
48	Hewlett-Packard Company	3	0,249	0,030	0,004
49	Honeywell International Inc.	6	0,284	0,061	0,063
50	Intel Corporation	5	0,249	0,051	0,032
51	International Business Machines Corp.	12	0,351	0,121	0,142
52	Johnson & Johnson	4	0,259	0,040	0,005
53	JPMorgan Chase & Co.	7	0,277	0,071	0,038
54	Kraft Foods Inc.	5	0,255	0,051	0,027
55	Lowe's Companies Inc.	1	0,212	0,010	-
56	Marathon Oil Corporation	9	0,310	0,091	0,125
57	Mastercard Incorporated	1	0,198	0,010	-
58	McDonald's Corp.	6	0,278	0,061	0,030
59	Medtronic Inc.	4	0,297	0,040	0,026
60	Merck & Co. Inc.	5	0,282	0,051	0,041
61	MetLife, Inc.	3	0,253	0,030	0,011
62	Microsoft Corporation	2	0,232	0,020	0,006
63	Monsanto Co.	0	-	-	-
64	Morgan Stanley	5	0,295	0,051	0,072
65	News Corp.	1	0,195	0,010	-
66	Nike Inc.	3	0,256	0,030	0,008
67	Occidental Petroleum Corporation	1	0,204	0,010	-
68	Oracle Corp.	1	0,223	0,010	-
69	PepsiCo, Inc.	6	0,271	0,061	0,041
70	Pfizer Inc.	8	0,279	0,081	0,034
71	Philip Morris International, Inc.	1	0,177	0,010	-
72	PNC Financial Services Group Inc.	2	0,232	0,020	0,007
73	Praxair Inc.	2	0,186	0,020	0,018
74	Procter & Gamble Co.	8	0,292	0,081	0,047
75	Prudential Financial Inc.	5	0,253	0,051	0,006
76	QUALCOMM Incorporated	0	-	-	-
77	Schlumberger Limited	0	-	-	-
78	Simon Property Group Inc.	1	0,218	0,010	-
79	Southern Company	1	0,217	0,010	-
80	Target Corp.	7	0,302	0,071	0,038
81	Texas Instruments Inc.	1	0,207	0,010	-
82	The Bank of New York Mellon Corporation	5	0,235	0,051	0,031
83	The Coca-Cola Company	3	0,260	0,030	0,009
84	The Dow Chemical Company	3	0,277	0,030	0,010
85	The Goldman Sachs Group, Inc.	5	0,273	0,051	0,022
86	The Home Depot, Inc.	1	0,221	0,010	-
87	Time Warner Inc.	0	-	-	-
88	U.S. Bancorp	1	0,244	0,010	-
89	Union Pacific Corporation	1	0,163	0,010	-
90	United Parcel Service, Inc.	5	0,296	0,051	0,035
91	United Technologies Corp.	6	0,271	0,061	0,037
92	Unitedhealth Group, Inc.	0	-	-	-
93	Verizon Communications Inc.	5	0,291	0,051	0,060
94	Viacom	0	-	-	-
95	Visa, Inc.	3	0,246	0,030	0,004
96	Walgreen Co.	1	0,211	0,010	-
97	Wal-Mart Stores Inc.	5	0,272	0,051	0,032
98	Walt Disney Co.	7	0,293	0,071	0,043
99	Well Point Inc.	1	0,219	0,010	-
100	Wells Fargo & Company	8	0,288	0,081	0,051

Tab. 12. the characteristics of interlocking directorship network of top 100 companies in the USA in 2011 (after Baccini, Marroni (September 2013)).

Fig. 6 displays the *interlocking directorship network* of the *top 100 companies in the USA in 2011* in *Baccini, Marroni (September 2013)*.

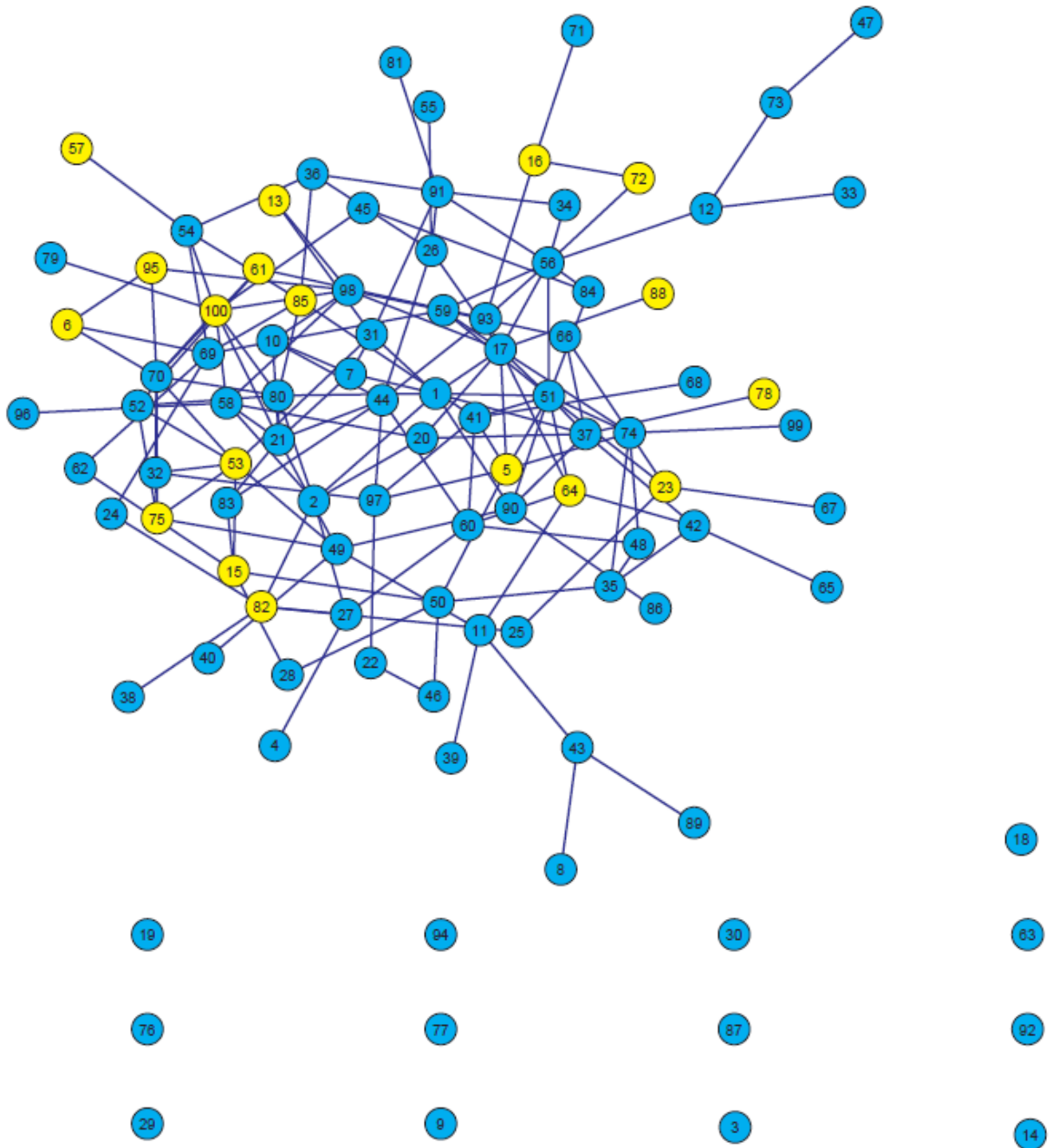


Fig. 6. *The interlocking directorship network of the top 100 companies in the USA in 2011. Yellow color denotes the directorships from financial industry (after Baccini, Marroni (September 2013)).*

The *interlocking interconnecting directors networks in the Canadian firms* have been described in *Ornstein (1984), Rowley (1997, 1998, 2000), Elms, Berman, Rowley (2000), Rowley (June 3, 2005), Rowley, Baum (2008), Carroll, Malcolm (August 1999)*. The second author had a wonderful opportunity to get the *complete information* on the *interlocking interconnecting directors networks* and discuss the *research problem* on the *boards' of directors overlap* in the *Canadian firms* in *Rowley (June 3, 2005)*. The *Canadian boards of directors*, which have the strong influences on the *public opinion* or the *business and political processes* in *Canada*, are mainly governed / chaired by the *elected (appointed) directors* from the *USA*. For example, the *board of director* at the *Torstar Corporation* in *Toronto, Canada* is governed by a *professor* from *Fuqua Business School at Duke University, North Carolina, USA*, because the *Torstar Corporation* is frequently used by the *US authorities* to control the *Canadian officials* in the *Canada*.

Researching the *composition of the boards of directors in Asian firms*, *Humphry Hung (July 2003)* writes: “The *model* proposes that a *board of directors* can be regarded as a *strategic device of a corporation* to influence and obtain resources through the *business and interpersonal networks of directors*. The choice of networks is therefore critical for the interlocking to be effective. The selection of *inbound directors* and *external corporations for outbound directors* can be used to achieve the *strategic goals of the organizations*.”

Humphry Hung (July 2003) continues to explain: “A *board of directors* can be a powerful tool in the *strategic management process*. *Hung (1998)* identified *six roles of board of directors: link, coordinate, control, strategize, maintain and support*. These roles serve to assist the organizations to achieve their corporate objectives. *Directors' resource endowment* will be imperative for their *governing boards* to fulfill their roles effectively (*Burt, 1997; Stuart, 1998; Gulati & Garguilo, 1999*). With an appropriate mix of *directors*, an organization can maximize the utilization of the *networks* it embeds or intends to penetrate. *Board composition* can be used as a device to enhance *competitive advantages* through acquiring *comparative advantages of resource endowment by interlocking directorates*. A *board of director* is actually a low-cost reservoir of resources and also channels for the corporation to gain access to relevant *organizational networks* and senior executives of the organization to reach appropriate *corporate elites' networks*.”

Humphry Hung (July 2003) concludes: “The need for strategic analysis of the resource endowment of the incumbent organization is a prerequisite condition for a *strategic use of boards*. A careful selection of both *organizational and corporate elites' interpersonal networks* may pave the way for an appropriate choice of *inbound directors*. Based on the model, *board*

effectiveness should be measured by the extent the governing board has contributed toward the response of the organization in meeting the challenge of the environment. An appropriate board composition can provide considerable contributions to the performance of the organization.”

The measurements on the extent and implications of director interlocking in the pre-war Japanese banking industry in Asia have been conducted in Okazaki, Yokoyama (October 2001).

The interlocking interconnecting directors networks in the boards of directors in the publicly traded and non-traded firms and the related scientific topics have been researched (in a chronological order) in Brandeis (1915, 1933), Luce, Perry (1949), Selznick (1949, 1957), Ford, Fulkerson (1956), Hopkins (1964), Milgram (1967), Travers (1968), Vance (1968), Dooley (1969), Harary (1969), Bunting, Barbour (Autumn 1971), Bunting (1976), Mace (1971), Pfeffer (1972, 1973, 1981, 1983), Pfeffer, Salancik (1978), Blumberg (1973), Bron, Kerbosch (1973), Granovetter (1973), Allen (1974), Doreian (1974), Zeitlin (1974), Mariolis (1975), Buchmann (1976), Burt (1976, 1983), Cuyvers, Meeusen (1976, 1985), Wilson (1976), Hughes, John, Mackenzie (1977), Tukey (1977), Pfeffer, Salancik (1978), Freeman (1979a, b), Koenig, Gogel, Sonquist (1979), Mokken (1979), Burt (1980, 1997), Pennings (1980), Radcliff (1980), Boje, Whetten (1981), Mintz, Schwartz (1981, 1985), Mizruchi, Bunting (1981), Mizruchi (1982, 1992, 1996), Stearns, Mizruchi (1986), Mizruchi, Schwartz (editors) (1987), Mizruchi, Stearns (1988, 1994), Byrd, Mizruchi (2005), Schoorman, Bazerman, Atkin (1981), Mariolis, Jones (1982), Barnes (1983), Burt (1983), Dodd, Warner (1983), Palmer (1983), Roy (1983), Vance (1983), American Bar Association (1984, 2011), Lease, McConnell, Mikkelson (1984), Ornstein (1984), Scott, Griff (1984), Useem (1984), Ziegler (1984), Baysinger, Butler (1985), Bearden, Mintz (1985), Galaskiewicz, Wasserman, Rauschenbach, Bielefeld, Mullaney (1985), Demsetz, Lehn (1985), Meeusen, Cuyvers (1985), Stokman, Wasseur (1985), Stokman, van der Knoop, Wasseur (1990), Mace (1986), Glatthard (1987), Richardson (1987), Hermalin, Weisbach (1988, 1998), Kesner (1988), Weisbach (1988), Hill C W L, Snell (1988), Zajac (1988, 1996), Fosberg (1989), Lorsch, MacIver (1989), Nelson (1989), Singh, Harianto (1989), Zahra, Pearce (1989), Pearce, Zahra (1992), Baysinger, Hoskisson (1990), Gilson (1990), Glaus (1990), Kaplan, Reishus (1990), Kaplan, Minton (1994), Powell (1990), Rosenstein, Wyatt (1990, 1994, 1997), Burris (1991), Davis (1991), Davis, Greve (1997), Davis, Yoo, Baker (2002, 2003), Davis, Yoo, Vast (2003), Goodstein, Boeker (1991), Hermalin, Weisbach (1991, 2001), Byrd, Hickman (1992), Demb, Neubauer (1992), Fligstein, Brantley (1992), Gerlach (1992), Judge, Zeithaml (1992), Lee, Rosenstein, Rangan, Davidson (1992), Lincoln, Gerlach, Takahashi (1992), Lipton, Lorsch (1992), Mallette, Fowler (1992), Milgrom, Roberts (1992), Pettigrew (1992), Smith, Watts (1992), Daily, Dalton (1993), Haunschild (1993), Haunschild, Beckman (1998), Jensen (1993),

Johnson, Hoskisson, Hitt (1993), Kester (1993), Millstein (1993), Shivdasani (1993), Shivdasani, Yermack (1999), Barnhart, Marr, Rosenstein (1994), Brickley, Coles, Terry (1994), Brickley, Coles, Linck (1999), Daily, Dalton (1994, 1997), Dalton, Daily, Ellstrand, Johnson (1998), Dalton, Daily, Johnson, Ellstrand (1999), Goodstein, Gautam, Boeker (1994), Huse (1994), Krackhardt (1994), Tricker (1994), Wasserman, Faust (1994), Wassermann, Faust, Iacobucci (1994), Wasserman, Galaskiewicz (1994), Benassi (1995), Fligstein (1995), Hallock (January 1995), Hill S (1995), Kini, Kracaw, Mian (1995), Klein (1995), Lorsch (January - February 1995), Moerland (1995, 1997, 1999), Monks, Minow (1995), O'Neal, Thomas (1995), Pfannschmidt (1995), Wunderer (1995), Agrawal, Knoeber (1996), Beasley (1996), Bhagat, Black (May 10-11 1996, 1998), Booth, Deli (1996, 1999), Borokhovich, Parrino, Trapani (1996), De Cecco, Ferri (1996), Doz (1996), Park, Rozeff (1996), Sundaramurthy (1996), Sundaramurthy, Mahoney, Mahoney (1997), Miller (March 26 1997), Yermack (1996), West (1996), Williamson (1996), Bianco, Pagnoni (1997), Cotter, Shivdasani, Zenner (1997), Davies, Gower (1997), Hallock (1997), John, Senbet (1997), Loderer, Martin (1997), Uzzi (1997), Loderer, Peyer (September 5 2001, 2002, June 3, 2005), Podolny, Baron (1997), Rosenstein, Wyatt (1997), Rowley (1997, 1998), Elms, Berman, Rowley (2000), Rowley, Behrens, Krackhardt (2000), Rowley, Baum (2008), Shleifer, Vishny (1997), Tufano, Sevick (1997), Bollobas (1998), Charan (1998), Collin (1998), Denis, Sarin (1998), Eisenberg, Sundgren, Wells (1998), Everett, Borgatti (1998), Fried, Bruton, Hisrich (1998), Gulati (1998, 1999), Gulati, Singh (1998), Khanna, Gulati, Nohria (1998), Gulati, Garguilo (1999), Gulati, Westphal (1999), Gargiulo, Gulati (January 2000), Haunschild, Beckman (1998), Hermalin, Weisbach (1998, 2003), Hopt (1998), Hopt, Kanada, Roe, Wymeersch, Prigge (editors) (1998), Hopt, Leyens (2004), Hung (1998), Klein (1998a, b), La Porta, Lopez de Silanes, Shleifer, Vishny (1998), Mac Canna, Brennan, O'Higgins (1998), Sanders, Carpenter (1998), Stuart (1998), Spencer (1998), Watts, Strogatz (1998), Wagner, Stimpert, Fubara (1998), Watts, Strogatz (1998), Watts (1999a, b, c), Barabasi, Albert (1999), Barabasi (2002), Bhagat, Black (1999, 2002), Borgatti, Everett (1999), Borgatti, Everett, Freeman (2002), Borgatti (2002, 2005, 2006), Borgatti, Foster (2003), Carroll, Malcolm (August 1999), Core, Holthausen, Larcker (1999), Davies A (1999), Fohlin (1999), Forbes, Milliken (1999), Maassen (1999), MacAvoy, Millstein (1999), Maman (1999, 2001), Postma, van Ees, Garretsen, Sterken (1999), Shivdasani, Yermack (1999), Vafeas (1999), Van Manen, Hooghiemstra (1999), Adams (2000), Barbi (2000), Blackhurst (2000), Dyer, Noboeka (2000), Fich (2000), Gulik, Gedajlovic, Maassen, van den Bosch, Volberda (July 8-11 2000), Kracaw, Zenner (2000), Miwa, Ramseyer (2000), Robert III, Evans, Honemann, Balch (October 1 2000), Scott (2000), Sterman (2000), Ward (2000), Ferris, Masciandaro, Messori

(2001), Ferris, Jagannathan (2001), Ferris, Jagannathan, Pritchard (2002, 2003), Heracleous, Murray (2001), Kroszner, Strahan (2001a, b), Newman, Strogatz, Okazaki, Yokoyama (October 2001), Watts (2001), Newman (2003, 2007), Snijders (2001, 2003), Tomka (2001), Bainbridge (2002), Becht, Bolton, Roell (October 2002), Bianchi, Bianco, Enriques (2002), Bianchi, Bianco, Giacomelli, Paccos, Trento (2005), Bianchi, Bianco (2006), Carver (2002), Everard, Henry (2002), Faccio, Lang (2002), Perry, Peyer (September 2002, August 12 2005), Volpin (2002), Dann, Del Guercio, Partch (2003), De (2003), Gillette, Noe, Rebello (2003), Fich, White (2003, 2005), Fich, Shivdasani (2006), Hermalin, Weisbach (2003), Humphry Hung (July 2003), Malcolm (2003), Ong, Wan, Ong (October 2003), Ornstein (2003), Phan, Lee, Lau (2003), Rodriguez, Cardenas, Oltra (2003), Bebchuk, Cohen, Ferrell (2004), Bebchuk, Cohen (2005), Bebchuk, Grinstein, Peyer (2006a, b), Bebchuk, Cremers, Peyer (2007), Battiston, Catanzaro (2004), Caldarelli, Catanzaro (2004), Hakansson, Lind (2004), Heinze (2004), Hopt (2004), Levine (April 2004), OECD (2004), O'Hagan, Green (2004), Rinaldi (June 25-26 2004), Rinaldi, Vasta (2005), Robins, Alexander (2004), Stablein, Cleland, Mackie, Reid (2004), Attig, Morck (2005), Carrington, Scott, Wasserman (2005), Chabi, Maati (2005), Charan (2005), De Nooy, Mrvar, Batagelj (2005), Hanneman, Riddle (2005), Raheja (2005), Rinaldi, Vasta (2005), Aguilera (2006), Batagelj, Mrvar (2006), Barucci (2006), Bertoni, Randone (2006), Bizjak, Lemmon, Whitby (2006), Carbonai, Di Bartolomeo (2006), Carretta, Farina, Schwizzer (2006), Chhaochharia, Grinstein (2006a, b, 2007), Conyon, Muldoon (2006a, b), Corrado, Zollo (2006), Elouaer (2006), Ferrarini (2006), Flores (2006), Guieu, Meschi (2006), Jackson (2006), Kramarz, Thesmar (2006), Kiel, Nicholson (2006), Morresi (2006), Murgia (2006), Prinz (2006), Silva, Majluf, Paredes (2006), Soon Moon Kang (May 23 2006), Adams, Ferreira (2007), Adams, Hermalin, Weisbach (2010), Ciocca (2007), Deloof, Vermoesen (December 2011), Enriques, Volpin (Winter 2007), Gerber (2007), Murray (2007), Non, Franses (2007), Provan, Fish, Sydow (2007), Rommens, Cuyvers, Deloof (November 2007), Santella, Drago, Polo (November 11 2007), Uzzi, Amaral, Reed-Tsochas (2007), Bowen (2008), Farina (2008), Harris, Raviv (2008), Milaković, Alfarano, Lux (2008), Milaković, Raddant, Birg (2009), Alfarano, Milaković (2009), Tutelman (2008), Alvarez, Marin, Fonfria (2009), Bizjak, Lemmon, Whitby (2009), Cai, Garner, Walkling (2009, 2010), Santella, Drago, Polo, Gagliardi (2009), Rosch (2009), Schonlau, Singh (2009), Baccini, Barabesi (2010), Baccini, Marroni (September 2013), Stuart, Yim (2010), Black, Kim (2011), Donzé (2011), Gabrielsen, Hjelmeng, Sorgard (2011), Rousseau, Stroup (2011), Chu (2012), Ghezzi (2012), Gonzalez Diaz (2012), Pawlak (2012), Schifeling, Mizruchi (August 27 - 28 2012), Uddin (2012), Anderson, Sawyer (2014),

Whitehead (December 2014), Ferreira (January 15 2015), Wikipedia (January 15 2015), Blood, Wisniewska (January 22 2015).

Winning virtuous strategies creation by interlocking interconnecting directors in boards of directors during strategic governance of firms

Going from the *information theory* and *information communication theory* in Shannon (1948), Yaglom A M, Yaglom I M (1983), we know that the *information* can be transmitted in the *analogue and digital formats* in the *XI century*. Therefore, the *authors* would like to formulate the *theory of the board of directors* as well as the *interlocking interconnecting directors' networks in the boards of directors in the firms*, going from the *information theory* and *information communication theory perspectives* in Shannon (1948), Yaglom A M, Yaglom I M (1983). The *authors* make a logical assumption that the **director works with the information in the firm**, performing various kinds of manipulations with the *information* to form his *opinions* and make his decisions on the *business related issues* in the *firm*.

Let us focus on a possible representation of the **director** in terms of the *information communication theory*. In the *proposed theoretical framework*, the *authors* come up with a *research idea* that the **director** works to make the *decisions* on the a *number of different business related tasks in the firm* by doing the following things

1. the *information sensing and detection*,
2. the *information filtering*,
3. the *information processing*,
4. the *information resonant absorption*,
5. the *information analysis*,
6. the *decision making, using the available information*.

Speaking about the **information sensing**, we can conditionally imagine that the *director* is a *sensing and detecting device* with the *embedded optical, sound, chemical sensors and detectors*, which can gather the *information data streams* in the *information fields*.

Considering the **information filtering**, it would be interesting to say that every *director* has the *accumulated knowledge base, subject oriented skills developed during his education at university, professional experiences obtained in the process of work*, can allow the *director* to *tune into the selected information data streams at certain frequencies* and to *filter out the undesired information streams*, working at the *board of directors* in the *firm*. The *filtered information* by every *director* is different, but some correlations may occur. Moreover, the

filtered information can be distorted during the *information filtering process*, because of various factors such as the *existing imperfections* in the *director's professional education, professional experiences*, and problems with the *data communication channels*.

Discussing the ***information processing***, we would like to make a *theoretical proposition* that the ***director can be represented as an information processing element*** with the ***Harvard director's mindset architecture*** or the ***von Neumann director's mindset architecture*** or some other possible *director's mindset architectures* in agreement with the *digital signal processing* and *business administration sciences*. Let us suppose that the classical *von Neumann director's mindset architecture* has a *single memory* to store the *data* and *program instructions*; and the *Harvard director's mindset architecture* has the *two separate memories* to keep the *data* and *program instructions*, achieving a *high degree of concurrency* in Hwang, Briggs (1984), Anceau (1986), Fountain (1987), Chen (editor) (1988), Van de Goor (1989), Prisch (1998), Wanhammar (1999). Thus, we firmly believe that the *director's mindset architecture* may have the *multiple distinctive impacts* on the *information processing volume, quality and time*, resulting in an appearance of the *different professional director's characteristics*. In other words, the *nature of the director's mindset architecture* can partly explain an observation of variations in the *functional performance of the board of directors*, resulting in the *different paths of enterprises evolution*.

Focusing on the ***information resonant absorption***, the *authors* want to note that the *director's resonant absorptive capacity* in respect to the *information*, that is his ability to obtain and store the *knowledge and information* from the *external environment*, is defined by the *director's professional education, professional experiences*, etc. The *absorption phenomena* with an emphasis on the *knowledge creation and accumulation* in the *organization* in the *economics* has been researched in Cohen, Levinthal (1989, 1990), Nonaka (1994), Kumar, Nti (1998), Lane, Lubatkin (1998), Farina (2008). The *director's resonant absorptive capacity in respect to the information* is to some degree analogous to the *resonant absorption phenomena* in the *condensed matter* and *soft condensed matter* in the *physics* and *chemistry*, which has been researched by the *authors* early:

1. The ***absorption of the different radioactive chemical elements and their isotopes in the soft condensed matter (the coal granules of different geometric shapes, the coal dust particles of micro- and nano- sizes) at the sound frequencies*** have been researched in the *nuclear physics* in Neklyudov, Dovbnaya, Dikiy, Ledenyov O P, Lyashko (2014), Ledenyov O P, Neklyudov (2013), Neklyudov, Dovbnaya, Dikiy, Ledenyov O P, Lyashko (2013), Neklyudov, Ledenyov O P, Fedorova, Poltinin (2013a, b), Neklyudov, Fedorova, Poltinin, Ledenyov O P (2013), Ledenyov

O P, Neklyudov, Poltinin, Fedorova (2012a, b), Neklyudov, Ledenyov O P, Fedorova, Poltinin (2012), etc.

2. The **absorption of the electromagnetic signals in the condensed matter (the high pure metals and superconductors) at the ultrasonic frequencies** has been investigated in the *solid state physics* at the in *Ledenyov O P (2012a, b, c), Ledenyov V O, Ledenyov D O, Ledenyov O P, Tikhonovsky (2012), Ledenyov O P, Fursa V P (2012), Shepelev, Ledenyov O P, Filimonov (2012a, b, c, d, e), etc.*

3. The **absorption of the electromagnetic signals in the sub-surface layers in the condensed matter (the high temperature superconducting ceramics and dielectrics) at the ultra high frequencies** has been studied in the *solid state physics* in *Ledenyov D O, Mazierska, Allen, Jacob (2012), Leong, Mazierska, Jacob, Ledenyov D O, Batt (2012), Mazierska, Ledenyov D O, Jacob, Krupka (2012), Jacob, Mazierska, Ledenyov D O, Krupka (2012), Mazierska, Krupka, Jacob, Ledenyov D O (2012), Jacob, Mazierska, Leong, Ledenyov D O, Krupka (2012), Jacob, Mazierska, Krupka, Ledenyov D O, Takeuchi (2012), Mazierska, Jacob, Ledenyov D O, Krupka (2012), Ledenyov D O (2013), Ledenyov D O, Ledenyov V O (2014), Mazierska, Leong, Ledenyov, Rains, Zuchowski, Krupka (2014), etc.*

Going to the topics of the **information analysis and subsequent decision making** by the *director in the board of directors in the firm*, let us focus on a possible representation of the **board of directors** in terms of the *information communication theory*. In the *predefined set of coordinates*, the **board of directors** with a *certain number of elected appointed directors* can be theoretically represented as

1. An **electronically scanned electronically steered phased array radar** with a certain number of active elements (*directors*), which can sense the information and tune into the selected *information carrier frequencies bands* in the *information fields*;

2. A **filters bank** with a certain number of *information filters*, which tunes into the *certain data streams frequencies* and reject the *unnecessary information streams* in the *adjacent channels* over all the *frequencies range*;

3. An **array of digital signal processors** with the *Harvard / von Neumann architectures*, which process the *digitized data streams*, using the *predefined information processing algorithms*, which can be implemented in the *hardware* or the *software*;

4. A **memory chipset** with the *ultra fast short and long term memories*, which store the *absorbed information* and provides a fast access to the *absorbed information*.

Now, let the *authors* formulate the **Ledenyov theory** on the *winning virtuous business strategies creation* by the *directors* at the *resonant absorption of discrete information* in the

diffusion - type financial economic systems with the induced nonlinearities. The Ledenyov theory postulates that the director with the highest information absorption capacity, who experience the phenomenon of resonant - type absorption of information, is able to create the winning virtuous strategies through the decision making process on the available business choices in the diffusion - type financial economic system with the induced nonlinearities, applying the econophysical econometrical analysis techniques in Schumpeter (1906, 1933), Bowley (1924), Box, Jenkins (1970), Grangel, Newbold (1977), Van Horne (1984), Taylor S (1986), Tong (1986, 1990), Judge, Hill, Griffiths, Lee, Lutkepol (1988), Hardle (1990), Grangel, Teräsvirta (1993), Pesaran, Potter (1993), Banerjee, Dolado, Galbraith, Hendry (1993), Hamilton (1994), Karatzas, Shreve (1995), Campbell, Lo, MacKinlay (1997), Rogers, Talay (1997), Hayashi (2000), Durbin, Koopman (2000, 2002, 2012), Ilinski (2001), Greene (2003), Koop (2003), Davidson, MacKinnon (2004), Campbell, Lo, MacKinlay (1996), Vialar, Goergen (2009) and using the creative imperative integrative intelligent conceptual co-lateral adaptive logarithmic thinking process with the use of the inductive, deductive and abductive logics in Martin (1998-1999, 2005-2006) in the frames of the strategic choice structuring process, that is the winning through the distinctive choices process in Porter (1979, 1980, 1982a, b, 1983, 1985, 1987a, b, 1991, 1994a, b, 1996a, b, 1997, 2001a, b, 2008, 2013), Porter, Harrigan (1981), Porter, Salter (1982), Montgomery, Porter (1991), Porter, Rivkin (2000), Porter, Sakakibara (2004), Anand, Bradley, Ghemawat, Khanna, Montgomery, Porter, Rivkin, Rukstad, Wells, Yoffie (2005), Porter, Kramer (2006), Hill, Jones (1998, 2004), Martin (1998-1999b, 2004, 2005-2006a, b, 2009), Moldoveanu, Martin (2001), Lafley, Martin (2013), Grant (2001), Choo, Bontis (2002), Drejer (2002), Sadler (2003), Roney (2004), Ireland, Hoskisson, Hitt (2006), Besanko, Shanley, Dranove (2007), Hitt, Ireland, Hoskisson (2007), Gavetti, Rivkin (2007), Teece, Winter (2007), aiming both to get an increased business valuation (a return premium) and to make a positive social impact in the local community and society in the frames of the socially responsible investment (SRI) process that integrates social, environmental, and ethical considerations into investment decision making in the real sector of economy in Waddock, Graves, (1994), Arora, Gangopadhyay (1995), Sparkes (1998, 2004, 2008), Johnson, Greening (1999), Lydenburg (2002), Cox, Brammer, Millington (2004), Kotler, Lee (2005), Louche, Lydenberg (2006), McWilliams, Siegel, Wright (2006), Scholtens (2006), Cespa, Cestone (2007), Cumming, Johan (2007), Williams (2007), Hull, Rothenberg (2008), Reinhardt, Stavins, Vietor (2008), Renneboog, Horst, Zhang (2008), Arjalies (2010), Crifo, Mottis (2010), Morrell, Clark (2010), Baron, Harjoto, Jo (2011), Crifo, Forget (February, 2012).

Let us add a few *important research remarks*, which should be considered during an ***accurate characterization of the overlapping interconnecting interlocking directors networks in the boards of directors in the firms*** in the frames of the *presented corporate governance research*.

Continuing the *discussion* on the *accurate characterization* of the *overlapping interconnecting interlocking directors networks in the boards of directors in the firms*, the authors would like to note that the *wireline information communication networks (ADSL)*, *wireless information communication networks (GSM, WCDMA, UMTS)*, the *optical information communication networks (SONET, ATM, all optical CDMA)* can be accurately characterized by 1) the *transmitted data stream measurements*, and 2) the *existing bit error rate measurements (BER)*, using the *eye diagram* and the *special measurement equipment*, in accordance with the *US Federal Communication Commission (FCC)* technical requirements. We would like to add that 1) the *director's boards seats accumulation number*, 2) the *overlapping interconnecting interlocking directors networks configuration*, and 3) the *director's centrality (the Freeman Degree [the potentiality to act or communicate with a specified number of directors] in Freeman (1979a, b) and Betweenness Centralization [the number of paths that pass through a node] as the measures of connections density of a director in the core network)* in the *overlapping interconnecting interlocking directors networks in the boards of directors in the firms* are the *only parameters*, which describe the *overlapping interconnecting interlocking directors networks performance* in the *business administration science literature* so far. ***The authors propose to use both 1) the transmitted information data-stream measurements, and 2) the existing bit error rate measurements (BER) in the overlapping interconnecting interlocking directors networks in the boards of directors in the firms to accurately characterize the overlapping interconnecting interlocking directors networks performance and the director's competence and effectiveness.*** In other words, the *authors* suggest that the *information*, which is *generated, transmitted and received* by the *director* in the *overlapping interconnecting interlocking directors networks in the boards of directors in the firms* can accurately characterize the *overlapping interconnecting interlocking directors networks performance*, and tell the true story about the *director's competence and effectiveness*, impacting the *involved firms' valuations*. Let us highlight the existing differences between the *presently used parameters* such as the 1) the *director's boards seats accumulation number*, 2) the *overlapping interconnecting interlocking directors networks configuration*, and 3) the *director's centrality (the Freeman Degree and Betweenness)* on one side and the proposed parameters such as 1) the *transmitted data stream measurements*, and 2) the *existing bit error rate measurements*

(*BER*) on another side of the coin. We would like to explain that the *director* can have a *big director's boards seats accumulation number*, an *advanced overlapping interconnecting interlocking director's professional networks configuration*, a *high degree of centrality*, however, at the same time, the *director* can *generate, transmit, receive the low information data streams (the information data flows)* in the *advanced overlapping interconnecting interlocking director's professional networks*, behaving as a *passive observer* and making the little or no useful contributions to the *boards of directors work* in the *considered firms*. In other words, let the *authors* repeat that, in our opinion, the *information*, which is *generated, transmitted and received* by the *director* in the *overlapping interconnecting interlocking directors networks* in the *boards of directors* in the *firms* is the *only important parameter*, which can *accurately characterize the director's competence, efficiency and effectiveness* during his/her work assignments in the *boards of directors* in the *firms*. In any *firm*, the *work performance*, shown by *every director*, will ultimately impact the *work performance*, demonstrated by the *board of directors*, which will certainly be reflected in the *firm's valuation* in *Carretta, Farina, Schwizer (2006), Black, Kim (2011)*.

We propose to introduce the Quality of Service measurements scale for the directors' competence and effectiveness measurements during their work performance evaluation in the boards of directors in the firms, going from the accurate characterization of the generated, transmitted and received information streams by the director in the boards of directors in the firms over a certain period of time.

We do believe that the generated, transmitted, and received information data streams in the interlocking interlinking interconnecting directors' networks have a highly asymmetric nature, because of some reasons. In our opinion, *every director* has the different education, professional experience, accumulated knowledge base and can allocate the different amounts of time to work at the *boards of directors* in the *firms*, hence the *director* will *generate, transmit, receive the various information data streams (the information data flows)*, resulting in the *asymmetric information data streams appearance* in the *interlocking interlinking interconnecting directors' networks* in the *boards of directors* in the *firms*.

Speaking about the *accurate characterization* of the *overlapping interconnecting interlocking directors networks* in the *boards of directors* in the *firms*, *we would like to emphasis that the conducted empirical research reveals another interesting fact that the positive and negative feedback loops, which can be created by the interlocking directors networks in the boards of directors in the firms, can quite possibly lead to the destructive coordination among the directors in the boards of directors in the firms by eliminating the*

randomness element and introducing the greater uniformity in the pursuing business strategies (the *destructive coordination* term is well described in Whitehead (2011, 2014)).

We think that the stability of interlocking interconnecting directors' network depends on the nature of stochastic dynamic processes in the interlocking interconnecting directors' network, hence it can be impacted by the election / appointment / introduction of a new directors into the overlapping interconnecting interlocking directors networks in the boards of directors in the firms in the time domain in Anishenko, Vadivasova, Astakhov (1999), Kuznetsov (2001). The stability is an important parameter in all types of modern networks in the economics, finances, electronics, energy sector, and information communication industry in Page, Wooders, Kamat (2005). For example, it is a well known fact that a fast random addition of the energy consumers to the energy distribution networks may result in a shift of the energy distribution networks out of a stable state, because of the origination of the stochastic dynamic resonance. The same processes can have place in the case of the electronic circuits with the interconnected networks of electronic components, hence the stability of electronic circuits is considered as an important parameter. The stability of wireless communications networks with the millions of active users is assumed to be quite important parameter as well.

Making the concluding comments on the strategy creation issue, the authors think that the different levels of the information sensing, information filtering, information processing, information absorption, information analysis and decision making with the obtained information by the director may have the certain positive or negative impacts on the director's winning virtuous strategy creation ability in the overlapping interconnecting interlocking directors networks in the boards of directors in the firms. Of course, the most complicated task for every wise director is to adjust to the optimal levels of the information sensing, information filtering, information processing, information absorption, information analysis, decision making, which can allow the winning virtuous strategy creation in the overlapping interconnecting interlocking directors networks in the boards of directors in the firms. We would like to mention that the excessive or insufficient levels of the information sensing, information filtering, information processing, information absorption, information analysis by the director may result in the bifurcations and chaos appearances in the frames of a decision making process on the winning virtuous strategy creation in the case of presence of the considered overlapping interconnecting interlocking directors networks in the boards of directors in the firms.

Using the knowledge base in the probability theory in De Laplace (1812), Bunyakovsky (1846), Chebyshev (1846, 1867, 1891), Markov (1890, 1899, 1900, 1906, 1907, 1908, 1910, 1911, 1912, 1913), Kolmogorov (1938, 1985, 1986), Wiener (1949), Brush (1968, 1977),

Shiryayev (1974, 1988, 1995), Pugachev (1979), the authors derived the appropriate universal formula to compute the probability number of the additional directorship mandates issues, depending on a set of already existing directorship mandates in the case of the interconnecting interlocking directors' networks in the boards of directors in the firms, $P(b + 1/b)$, in Milaković, Raddant, Birg (2009), Alfarano, Milaković (2009); and developed the **MicroID software program**, which makes the actual probabilistic prediction toward the director's election / appointment in the boards of directors in the firms, taking to the consideration both the director's technical characteristics and the interconnecting interlocking director's network parameters. We tested the MicroID software program, improved the computing recursive algorithm, and evaluated the accuracy of developed prediction models, comparing the obtained computing results with the real-world director's election / appointment numbers in the boards of directors in the firms in the considered cases of research interest.

Conclusion

The article presented an original research on the strategy creation by the interlocking interconnecting directors in the boards of directors in the firms in an information century. We reviewed the possible structures of the board of directors, and show that there are the interlocking directors networks in the boards of directors in a big number of firms. Researching the strategic governance of firms, we highlight a fact that the director makes the information sensing, filtering, processing, resonant absorption, analysis, decision making, hence it can be empirically represented as a digital signal processor with the Harvard or von Neumann director's mindset architectures. We think that the board of directors can be theoretically represented as the electronically-scanned electronically-steered phased array radar with a certain number of active antenna elements, filters banks, digital signal processors, memory chipsets in agreement with the digital signal processing and business administration sciences. Using the above theoretical assumptions, we formulate the Ledenyov theory on the winning virtuous strategies creation by the interlocking interconnecting directors in the boards of directors in the firms, which make the businesses in the conditions of the diffusion - type financial economic systems with the induced nonlinearities. We suggest that 1) the transmitted/received data stream measurements, 2) the bit error rate measurements have to be used to accurately characterize the interlocking interlinking interconnecting directors networks in addition to the well known parameters such as the director's boards seats accumulation number, centrality, Freeman degree, Betweenness and network configuration. We believe that

the *generated, transmitted, and received information data streams* in the *interlocking interlinking interconnecting directors' networks* have a *highly asymmetric nature*, because of some reasons. We think that the *positive and negative feedback loops*, which can be created by the *interlocking directors networks* in the *boards of directors* in the *firms*, can quite possibly lead to the *destructive coordination* among the *directors* by eliminating the *randomness element* and by introducing the *greater uniformity* in the *pursuing business strategies*. We derived the *appropriate universal formula* and developed the *MicroID software program* to compute the *probability number* of the *additional directorship mandates issues*, depending on a set of *already existing directorship mandates* in the case of the *interconnecting interlocking directors' networks* in the *boards of directors* in the *firms*. We applied the *accumulated knowledge bases* in the *nuclear physics, condensed matter physics, space physics, mathematical physics, econophysics* and *software engineering* to achieve our *main innovative advanced research goal*, namely to improve our *understanding* on the *winning virtuous strategies creation* by the *interlocking interconnecting directors* in the *boards of directors* in the *firms* in the *information century*.

Acknowledgement

The *directors* in the *boards of directors* in the *firms* face a number of business challenges as a result of *appearing disruptions* in the *economics* in an *information age*. In this *introductory condensed research article*, the *authors* use an original research approach in an attempt to find a *possible solution* for the *strategy creation problem*, which has to be solved by the *directors* in the *boards of directors* during the *strategic governance* of *firms*. The *international students* prepared the *brief abstracts of our invited lectures* at the *leading universities* around the *World* over the last two decade, and then the *authors* combined our *lecture notes* with the *brief abstracts of our invited lectures*, aiming to write a *research article*. We also decided to include *some our thoughts*, expressed during the *Q&A sessions* after the presented lectures and kindly recorded by our students. In addition, the *authors* included the *most interesting comments, professional advises, private opinions* on the *research subject* by the *directors of firms*, recorded during a few thousands of *business meetings* in *Europe, North America* and *Asia*. In our opinion, the *presented research findings* may be in the scope of interest by the *MBA students, professors in the business administration, management, finances, economics sciences, directors in the boards of directors, chairmen of the boards of directors, subject experts, and business leaders*, who

would like to stay up to the date on the recent developments in the *business administration science*.

The *first author's* knowledge on the *origins of the nonlinearities* in the *complex systems* in the *electrical, electronic, computer and financial engineering* has been obtained during the intensive innovative scientific collaboration with *Prof. Janina E. Mazierska, Personal Chair, Electrical and Computer Engineering Department, James Cook University, Townsville, Australia* and *former Dean, Electrical and Computer Engineering Department, James Cook University, Townsville, Australia, and former IEEE Director Region 10 in Australia, and IEEE Fellow*. The first author would like to acknowledge *Prof. Janina E. Mazierska* by expressing his sincere gratitude for the kind scientific advices on how to develop the *logical mathematical analysis skills, the scientific problems analytic solving ability and the abstract scientific thinking* to tackle the complex scientific problems on *the nonlinearities in the microwave superconductivity* as well as on *the nonlinearities in the economics*, applying the interdisciplinary scientific knowledge together with the advanced computer modeling techniques in the course of the cutting-edge highly innovative research projects at *James Cook University in Townsville in Queensland in Australia in 2000 – 2014* after the graduation from *V. N. Karazyn Kharkov National University in Kharkov in Ukraine in 1994 – 1999*.

There would be appropriate to say that, in an *information age*, the *first author's* special efforts have been primarily directed towards the *scientific information gathering, systematization and detailed analysis* in the frames of this research project on the *business strategy creation* by the *directors in the boards of directors in the firms*; hence, the *first author* would like to thank the professional staff at the *central library at James Cook University in Townsville, Queensland, Australia* for providing the *first author* with all the necessary technical support in relation to the literature search on the subjects of his *multidisciplinary research interest* in the *electronic research databases* at *Australian universities*, replying to the numerous chaotic research requests timely, and making everything possible to assist with the completion of the highly innovative advanced research on the *business strategy creation* by the *directors in the boards of directors in the firms*, which has been conducted at the *James Cook University in Townsville, Queensland in Australia in 2000 – 2015*.

The *first author* would like to comment that the *informative scientific discussions* on the *business strategy creation* by the *directors in the boards of directors in the firms*, which have been conducted by the *first author* with the *M.Sc. students, Ph.D. candidates, professors, visiting scientists and other faculty members* during the *numerous scientific seminars and brain storm research meetings* at *James Cook University in Townsville in Queensland in Australia*, are

generously appreciated, because these *valuable scientific opinions exchanges* encouraged the *first author* to generate the new original scientific ideas and make the *creative imperative integrative intelligent conceptual co-lateral adaptive logarithmic thinking* with the application of the *inductive, deductive and abductive logics analysis* as far as the *business strategy creation by the directors in the boards of directors in the firms*, is concerned.

A certain part of an *introductory condensed research article* has been written during the *first author's* *yachting* with the *Australian friends* in *Melbourne, Victoria, Australia* and in *Brisbane, Queensland, Australia*, when a number of the *creative research ideas* and *important research findings* on the *business strategy creation by the directors in the boards of directors in the firms*, came to his mind. Most of the ideas have been discussed with the *Australian friends*, when on the *yachts*. Sometimes, the thoughtful discussions have been further conducted during the “*numerous meetings without the ties*” with the great *Australian philosophers, professors, scientists, businessmen, lawyers, governmental officials and political leaders* in the relaxing trusted mutual-respect atmosphere, characterized by the *pluralism of research opinions* on the topics of interest, during the *Yarra valley* and *Mornington-Peninsula limo tours* (www.yarravalleylimowinetours.com.au). All these exchanges of opinions fascinated the *first author's mind*, stimulated the *abstract thinking on the presented assumptions*, and inspired to *work consistently* to complete the writing of this *highly innovative condensed research article* on the *business strategy creation by the directors in the boards of directors in the firms*, at *James Cook University* in *Townsville, Brisbane, and Gold Coast* in *Queensland* in *Australia* in *2015*.

The *first author* would like to thank cordially all the *European universities rectors, universities deans, distinguished professors, world renowned financiers, reputable economists* and *well respected businessmen* for *many tens of highly creative and productive business meetings* during the *first author's global intellectual journey* over the *European capitals*, including: *Warsaw, Poland; Berlin, Germany; Amsterdam, The Netherlands; Brussels, Belgium; Luxemburg, Luxemburg; Paris, France; Barcelona, Madrid, Spain; and Coimbra, Lisbon, Porto, Portugal* in *October, 2014*. It was nice to meet and discuss all the *problems of mutual research interest* with the *old European Friends*, coming from *Brisbane, Australia*.

It is not possible to underestimate an influence by the *classic music* on the development of *strategic thinking skills*, hence a visit by the *first author* to the *City of Vienna* in *Austria* in *Europe* during the *Christmas and New Year festivities* in *December 2014- January 2015* had a quite positive overall impact on the completion of *research article writing*.

After the graduation from *V. N. Karazyn Kharkov National University* in *Kharkov* in *Ukraine* in *1993*, the *second author* worked on the *research programs* in a number of

universities and institutions around the *World*. Thinking about this *research paper*, the *second author* would like to kindly acknowledge the numerous private communications with the participants of the *V. Ya. Bunyakovsky international conference* with the special focus on the *V. Ya. Bunyakovsky's research contributions to the mathematical theory of probability* and its modern applications in the *econophysics* and *econometrics*, which had place during a tour to the *Town of Bar, Vinnytsya Region, State of Ukraine* in the time of the conference, organized by the *Institute of Mathematics of National Academy of Sciences of Ukraine (NASU), Kyiv, Ukraine* on *August 20 – 21, 2004*. Absorbing the *brilliant research ideas* during a fruitful exchange by the *scientific opinions* among the conference attendees, the *second author* came up with a remarkable conclusion that the foundations of the *mathematical theory of probability* by *V. Ya. Bunyakovsky* enable us to perform a more accurate scientific analysis and characterization of the complex research problems on the *business strategy creation by the directors in the boards of directors in the firms*. The *first author* has been worked on the *research article*, discussing the *points of mutual research interest* with the *second author*, during his regular visits to the *Town of Bar, Vinnytsya Region, State of Ukraine* over the recent years.

It is a real tremendous pleasure to comment that some fundamental issues on the *business strategy creation by the directors in the boards of directors in the firms* have been researched by the *second author* during his *intensive research assignments* at the *Rotman School of Management, University of Toronto, Canada* in *1998 – 1999* and *2005 – 2006*. The *second author* met with many hundreds of *North American Corporations Presidents, Board of Directors Chairmen, Chief Executive Officers (CEOs), Chief Information Officers (CIOs), Chief Operating Officers (COOs)* and visited the *Research Triangle Park high-tech cluster near Durham in North Caroline* in the *USA* as well as the *Kanata high-tech cluster near Ottawa in Ontario*; the *Calgary high-tech cluster* in *Calgary in Alberta*; the *Richmond high-tech cluster near Vancouver in British Columbia* in the *North America* in *1998 – 2006*, the *Montreal high-tech cluster* in *Montreal in Quebec*, making his *innovative research* on the *business strategy creation by the directors in the boards of directors in the firms*. The obtained information has been researched and analyzed by the *second author* at the *Rotman School of Management, University of Toronto, Canada*, which was a *global hub of innovative scientific thinking* in the *economics* and *finances* mainly due to the *high level organizational and personal efforts* by *Prof. Roger L. Martin, former Dean, Rotman School of Management, University of Toronto, Canada*, who strongly supported and facilitated the *initiation of innovative research* and the *creation of intensive business education courses* in *Canada* on that time. It is important to underline the fact that the *Prof. Roger L. Martin, former Dean, Rotman School of Management, University of Toronto*,

Canada took a right decision to support our *innovative research* by all the available resources at *Rotman School of Management, University of Toronto, Canada*, including the *library, computer laboratory* and professional management consulting. Indeed, the *Rotman School of Management, University of Toronto, Canada* was a *global financial and economic center of gravity* on that time, where the *highly innovative research work* has been conducted by the *second author* from the early morning hours until the deep night, being occasionally interrupted by the *thoughtful long hours scientific discussions* on a variety of *research problems* in the *finances* with *Profs. John C. Hull and Roger L. Martin, Rotman School of Management, University of Toronto, Canada* in 1998 – 1999 and in 2005 - 2006. It makes sense to note that, in some cases, the *intensive research discussions* and *numerous consultations* have been continued during our *frequent meetings* at the *Economic Club of Toronto, Empire Club of Canada and Canadian Club* in *Toronto, Canada* outside the *U of T* in 2005 – 2006. Using every free minute in our busy research schedules, we discussed all the *scientific problems of mutual research interest*, aiming to find the *possible solutions* for the *challenging research problems* in the *time of globalization*.

The *second author* would like to thank *Prof. Roger L. Martin, former Dean at the Rotman School of Management* for a kind invitation to attend a day-long seminar, which has been organized by the *Rotman School of Management, University of Toronto, Toronto, Canada* at the *Canadian room* at the *Fairmont Royal York Hotel* in *Toronto, Canada* on *June 3, 2005*. The *second author* has been particularly interested in an announced presentation of research on the *complex interlocking directors networks in the boards of directors* within the *Canadian corporations* by *Tim Rowley, Professor, Rotman School of Management, Toronto, Canada*; *visiting Professor, INSEAD, France*.

The *second author* would like to thank *Prof. Roger L. Martin, former Dean at the Rotman School of Management* for a *cordial personal invitation* to attend a day-long seminar: “*Creativity: 21st Century Capital*,” which has been organized by the *Rotman School of Management, Toronto, Canada* at the *Fairmont Royal York Hotel* on *June 2, 2006*. It was a nice opportunity to discuss an *increasing role of creativity in the business opportunities widening in the XXI century* with *Mr. Thomas Stewart, former Editor-in-Chief, Harvard Business Review, Boston, USA*; *Prof. Jonathan Feinstein, Yale University, USA*; and *Prof. Richard Florida, Rotman School of Management, Canada*. It is necessary to especially highlight a long polemic on the numerous examples of *creativity in the field of econophysics*, which has been conducted with *Prof. Jonathan Feinstein, Yale University, USA*. It makes sense to mention an interesting thoughtful conversation on the *strategic governance in North America*, which has been

conducted with *Prof. Roger L. Martin* and cheered by a *friendly toast* with the *two glasses of young white wine* from the *Niagara Fall region in Ontario, Canada*.

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References:

Economics Science, Finance Science, Economic History Science:

1. Joseph Penso de la Vega 1668, 1996 *Confusión de Confusiones* re-published by *John Wiley and Sons Inc* USA.
2. Mortimer Th 1765 *Every man his own broker 4th edition* London UK.
3. Bagehot W 1873, 1897 *Lombard Street: A description of the money market Charles Scribner's Sons* New York USA.
4. von Böhm-Bawerk E 1884, 1889, 1921 *Capital and interest: History and critique of interest theories, positive theory of capital, further essays on capital and interest Austria; 1890 Macmillan and Co Smart W A (translator)* London UK
http://files.libertyfund.org/files/284/0188_Bk.pdf .
5. Hirsch M 1896 *Economic principles: A manual of political economy The Russkin Press Pty Ltd* 123 Latrobe Street Melbourne Australia.
6. Bachelier L 1900 *Theorie de la speculation Annales de l'Ecole Normale Superieure* Paris France vol **17** pp 21 – 86.
7. Schumpeter J A 1906 *Über die mathematische methode der theoretischen ökonomie ZfVSV* Austria.
8. Schumpeter J A 1933 *The common sense of econometrics Econometrica*.
9. Schumpeter J A 1911; 1939, 1961 *Theorie der wirtschaftlichen entwicklung; The theory of economic development: An inquiry into profits, capital, credit, interest and the business cycle* Redvers Opie (translator) *OUP* New York USA.
10. Schumpeter J A 1939 *Business cycle McGraw-Hill* New York USA.
11. Schumpeter J A 1947 *The creative response in economic history Journal of Economic History* vol **7** pp 149 – 159.
12. Slutsky E E 1910 *Theory of marginal utility M Sc Thesis Vernadsky National Library* Kiev Ukraine.
13. Slutsky E E 1915 *Sulla teoria sel bilancio del consumatore Giornale degli economisti e rivista di statistica* **51** no 1 pp 1 – 26 Italy.
14. Slutsky E E 1923 *On calculation of state revenue from emission of paper money Local Economy* **2** pp 39 – 62 Kiev Ukraine.
15. von Mises L 1912 *The theory of money and credit Ludwig von Mises Institute* Auburn Alabama USA
http://mises.org/books/Theory_Money_Credit/Contents.aspx .

16. Morris W (editor) 1913, 1982, 1985 *The American heritage dictionary* ISBN 0-395-32943-4 pp 1 – 1568.
17. Hayek F 1945 The use of knowledge in society *American Economic Review* **35** pp 519 – 530.
18. Ellis H, Metzler L (editors) 1949 *Readings in the theory of international trade* *Blakiston Philadelphia USA*.
19. Friedman M (editor) 1953 *Essays in positive economics* *Chicago University Press Chicago USA*.
20. Baumol W 1957 Speculation, profitability, and stability *Review of Economics and Statistics* **39** pp 263 – 271.
21. Debreu G 1959 *Theory of value* *Cowles Foundation Monograph vol 17 John Wiley & Sons Inc New York USA*.
22. Dodd N 2014 *The social life of money* *Princeton University Press NJ USA* ISBN: 9780691141428 pp 1 – 456.

Firm Theory Science, Business Administration Science:

23. Babbage Ch 1832 *On the economy of machinery and manufacturers* *Charles Knight 13 Pall Mall East London UK*.
24. Ueda 1904 *Shogyo Dai Jiten (The dictionary of commerce)* Japan.
25. Ueda 1937 *Keieikeizaigaku Saran (The science of business administration, Allgemeine Betriebswirtschaftslehre)* Japan.
26. Marshall A 1923 *Money, credit, and commerce* *Prometheus Books Amherst New York USA* ISBN 13: 9781591020363.
27. Berle A, Means G 1932a *The modern corporation and private property* *The Commerce Clearing House New York USA*.
28. Berle A A, Means G 1932b *The modern corporation* *MacMillan New York USA*.
29. Ohlin B 1933 *Interregional and international trade* *Harvard University Press Cambridge Massachusetts USA*.
30. Coase R H 1937 The nature of the firm *Economica* vol **4** (16) pp 386 – 405 doi:10.1111/j.1468-0335.1937.tb00002.x year=1937.
31. Barnard C I 1938 *The functions of the executive* *Harvard University Press Cambridge MA USA* pp 241 – 244.
32. Barnard C I 1948 *Organization and management: Selected papers* *Harvard University Press Cambridge MA USA*.
33. Barnard C I 1949 *The entrepreneur and formal organization* *Change and the Entrepreneur. Harvard University Press Cambridge MA USA*.

34. Barnard C I 1958 Elementary conditions of business morale *California Management Review* vol 1 no 1.
35. Solow R M August 1957 Technical changes and the aggregate production function *Review of Economics and Statistics* **39** pp 214 – 231.
36. Modigliani F, Miller M June 1958 The cost of capital, corporation finance, and the theory of investment *American Economic Review* pp 261 – 297.
37. Baumol W 1959 Business behaviour, value and growth.
38. Baumol W 1962 The theory of expansion of the firm *American Economic Review*.
39. Penrose E T 1959 The theory of the growth of the firm *Oxford University Press* Oxford UK, *John Wiley and Sons Inc* New York USA.
40. Marris R May 1963 A model of the managerial enterprise *Quarterly Journal of Economics* **77** pp 185 – 209.
41. Telser L 1963 Cutthroat competition and the long purse *Journal of Law and Economics* **9** pp 259 – 277.
42. Williamson O E 1964 The economics of discretionary behavior: Managerial objectives in a theory of the firm *Prentice-Hall* Englewood Cliffs NJ USA.
43. Williamson O E 1975 Markets and hierarchies: Analysis and antitrust implications *Free Press* New York USA.
44. Williamson O E 1988 Corporate finance and corporate governance *Journal of Finance* **43** pp 567 – 591.
45. Cyert R, March J G 1963, 1992 A behavioral theory of the firm *Wiley-Blackwell* 2nd edition ISBN 0-631-17451-6.
46. Fogel R 1964 Railroads and American economic growth: Essays in econometric history *Johns Hopkins Press* Baltimore USA.
47. Manne H G 1965 Mergers and the market for corporate control *Journal of Political Economy* **73-74** pp 110 – 120.
48. Stigler G 1968 The organization of industry *Richard Irwin Inc* Homewood USA.
49. Mano O 1968-1969 On the science of business administration in Japan *Hokudai Economic Papers* vol 1 pp 77 – 93 Hokkaido University Japan.
50. Mano O 1970-1971 The development of the science of business administration in Japan since 1955 *Hokudai Economic Papers* vol 2 pp 30 – 42 Hokkaido University Japan.
51. Mano O 1972-1973 An approach to the organization economy - The development of Barnard's theory *Hokudai Economic Papers* vol 3 Hokkaido University Japan.

52. Mano O 1975-1976 Social responsibility of the firm-one development of Barnard's theory *Hokudai Economic Papers* vol **5** Hokkaido University Japan.
53. Mano O 1978 Soshiki Keizai no Kaimei (Organization economy - A study of the management theory of C. L. Barnard) *Bunshindo* Tokyo Japan.
54. Mano O 1980-1981 Barnard's theory of education for executives *Hokudai Economic Papers* vol **10** Hokkaido University Japan.
55. Mano O 1987 Barnard no Keiei Riron (Management Theory of C. I. Barnard) *Bunshindo* Tokyo Japan.
56. Mano O 1994 The Differences between Barnard's and Simon's Concept of Organization Equilibrium-Simon's Misunderstanding about Barnard's Intention *Economic Journal of Hokkaido University* vol **23** Hokkaido University Japan.
57. Mano O 1995 On the Significance of Lateral Organization In C. I. Barnard's Theory *Economic Journal of Hokkaido University* vol **24** pp 1 – 13 Hokkaido University Japan.
58. Black F, Scholes M 1973 The pricing of options and corporate liabilities *Journal of Political Economy* vol **81** pp 637 – 654.
59. Black F, Cox J C 1976 Valuing corporate securities: Some effects of bond indenture provisions *Journal of Finance* vol **31** pp 351 – 367.
60. Merton R C 1973 Theory of rational option pricing *Bell Journal of Economics and Management Science* vol **4** pp 141 – 183.
61. Merton R C 1974 On the pricing of corporate debt: The risk structure of interest rates *Journal of Finance* vol **29** pp 449 – 470.
62. Lee, Jung Hwan 1975 An essay on the theory of the firm *農業経営研究* vol **2** pp 133 – 153.
63. Jensen M C, Meckling W H 1976 Theory of the firm: Managerial behavior, agency costs and ownership structure *Journal of Financial Economics* **3** pp 305 – 360.
64. Jensen M C, Ruback R S 1983 The market for corporate control: The scientific evidence *Journal of Financial Economics* **11** pp 5 – 50.
65. Jensen M C 1986 Agency costs of free cash flow, corporate finance and takeovers *American Economic Review Papers and Proceedings of the 98th Annual Meeting of the American Economic Association* **76** (2) pp 323 – 329.
66. Jensen M C September-October 1989 The eclipse of the public corporation *Harvard Business Review* **67** (5) pp 61 – 74
<http://papers.ssrn.com/abstract=146149> .
67. Jensen M C, Murphy K J 1990 Performance pay and top management incentives *Journal of Political Economy* **98** (2) pp 225 – 264.

68. Jensen M C 1993 The modern industrial revolution: Exit and the failure of internal control systems *Journal of Finance* **48** (3) pp 831 – 880.
69. Jensen M C 2007 The economic case for private equity *Unpublished Harvard NOM Research Paper no 07-02*.
70. Fama E 1980 Agency problems and the theory of the firm *Journal of Political Economy* **88** pp 288 – 307.
71. Fama E, Jensen M 1983 Separation of ownership and control *Journal of Law and Economics* **26** pp 301 – 325.
72. Fama E, Jensen M 1985 Organizational forms and investment decisions *Journal of Financial Economics* vol **14** pp 101 – 119.
73. Demsetz H 1983 The structure of ownership and the theory of the firm *Journal of Law and Economics* vol **26** pp 375 – 390.
74. Demsetz H 1997 Theories of the firm: Their contrasts and implications *Chung-Hua Series of Lectures no 25 The Institute of Economics Academia Sinica Nankang Taipei Taiwan Republic of China*.
75. Wernerfelt B 1984 A resource-based view of the firm *Strategic Management Journal* **5** pp 171 – 180.
76. Wernerfelt B 1995 The resource-based view of the firm: Ten years after *Strategic Management Journal* **16** pp 171 – 174.
77. Lode Li 1986 A stochastic theory of the firm *Working Paper no 1844-86 Sloan School of Management MIT USA*.
78. Perrow C 1986 Complex organizations *Random House New York USA*.
79. Hart O, Moore J 1990 Property Rights and the Nature of the Firm *Journal of Political Economy* vol **98** no 6 pp 1119 – 1158.
80. Hart O 2011 Thinking about the firm: A review of Daniel Spulber's the theory of the firm *Journal of Economic Literature* **49** (1) pp 101 – 113
<http://www.aeaweb.org/articles.php?doi=10.1257/jel.49.1.101> .
81. Sberman 2000 Business dynamics *McGraw Hill USA*.
82. Williamson O E 2002 The Theory of the Firm as Governance Structure: From Choice to Contract *Journal of Economic Perspectives* vol **16**(3) pp 171-195.
83. Gompers P A, Metrick A, Ishii J L 2003 Corporate governance and equity prices *Quarterly Journal of Economics* **118** pp 107 – 156.
84. Kantarelis D 2007 Theories of the firm *Inderscience Genève Switzerland* ISBN 0-907776-34-5, ISBN: 0-907776-35-3.

85. Jacobides M G 2008 Competitive environments and redefining firm and industry boundaries *Public Lecture* London School of Economics and Political Science London UK.
86. Jacobides M G 2008 Can firms shape their environments to gain an architectural advantage? *Public Lecture* London School of Economics and Political Science London UK.
87. Spulber D F 2009 The theory of the firm: Microeconomics with endogenous entrepreneurs, firms, markets, and organizations *Cambridge University Press* UK
<http://www.cambridge.org/9780521736602> .
88. Ledenyov D O, Ledenyov V O 2013b On the theory of firm in nonlinear dynamic financial and economic systems *Cornell University* NY USA [www.arxiv.org 1206.4426v2](http://www.arxiv.org/abs/1206.4426v2).pdf pp 1 – 27.

Board of Directors Science, Interlocking Directors Networks Science, Firms Networks Science, Social Networks Science:

89. Brandeis L D 1915 Annals of the American academy of political and social science vol **57** *Proceedings of the Conference of American Mayors on Public Policies as to Municipal Utilities* pp 45 – 49.
90. Brandeis L D 1933 Other people's money-and how the bankers use it *Jacket Library* Washington National Home Library Foundation USA.
91. Luce R, Perry A 1949 A method of matrix analysis of group structure *Psychometrika* **14** pp 95 – 116.
92. Selznick P 1949 TVA and the grass roots *University of California Press* Los Angeles California, *Harper & Row* New York USA.
93. Selznick P 1957 Leadership in administration *Harper & Row* New York USA.
94. Ford L R, Fulkerson D R 1956 Maximum flow through a network *Canadian Journal of Mathematics* **8** pp 399 – 404.
95. Hopkins T K 1964 The exercise of influence in small groups *Bedminister Press* Totawa New Jersey USA.
96. Milgram S 1967 The small world problem *Psychology Today* **2** pp 60 – 67.
97. Travers A H 1968 Interlock in corporate management and the antitrust laws *Texas Law Review* **45** p 819.
98. Vance S C 1968 The corporate director. A critical evaluation *Dow-Jones Irvine* Homewood Illinois USA.
99. Dooley P C 1969 The interlocking directorate *American Economic Review* **59** pp 314 – 323.
100. Harary F 1969 Graph theory *Addison-Wesley* Reading MA USA.

101. Bunting D, Barbour J Autumn 1971 Interlocking directorates in large American corporations, 1896 - 1964 *Business History Review* **45** (3) pp 317 – 335.
102. Bunting D 1976 Corporate interlocking, part III - Interlocks and return on investment *Directors & Boards* **1** pp 4 – 11.
103. Mace M L 1971 Directors: Myths and reality *Harvard University Press* Cambridge Massachusetts USA.
104. Pfeffer J 1972 Size and composition of corporate boards of directors: The organization and its environment *Administrative Science Quarterly* **17** pp 218 – 228.
105. Pfeffer J 1973 Size, composition, and function of hospital boards of directors: A study of organization-environment linkage *Administrative Science Quarterly* **18** pp 349 – 364.
106. Pfeffer J, Salancik G R 1978 The external control of organizations: A resource-dependency perspective *Harper & Row* New York USA.
107. Pfeffer J 1981 Power in organizations *Pitman* Marshfield MA USA.
108. Pfeffer J 1983 Organizational demography in *Research in organizational behavior* Cummings L L, Staw B M (editors) *JAI Press* **5** Greenwich pp 449 – 461.
109. Blumberg P 1973 Reflections on proposals for corporate reform through change in the composition of the board of directors: “Special interest” or “Public” directors *Boston University Law Review* **53** p 547.
110. Bron C, Kerbosch J 1973 Finding all cliques of an undirected graph *Communications of the ACM* vol **16** pp 575 – 577.
111. Granovetter M 1973 The strength of weak ties *American Journal of Sociology* **81** pp 1287 – 1303.
112. Allen M P 1974 The structure of interorganizational elite cooptation: Interlocking corporate directorates *American Sociological Review* **39** pp 393 – 406.
113. Doreian P 1974 On the connectivity of social networks *Journal of Mathematical Sociology* vol **3** pp 245 – 258.
114. Zeitlin M 1974 Corporate ownership and control: The large corporation and the capitalist class *American Journal of Sociology* **81** pp 894 – 903.
115. Mariolis P 1975 Interlocking directorates and control of corporations: The theory of bank control *Social Science Questions* **56** pp 425 – 439.
116. Buchmann P 1976 Organisation der Verwaltungsräte in 20 der grössten Aktiengesellschaften in der Schweiz Bern Switzerland, Stuttgart Germany.
117. Burt R S 1976 Position in networks *Social Forces* vol **55** pp 93 – 122.
118. Burt R S 1983 Corporate profits and cooptation *Academic Press* New York USA.

- 119.** Cuyvers L, Meeusen W 1976 The structure of personal influence of the Belgian holding companies *European Economic Review* **8** pp 51 – 69.
- 120.** Cuyvers L, Meeusen W 1985 Financial groups in the Belgian network of interlocking directorships in *Networks of corporate power: A comparative analysis of ten countries* Stokman F N, Ziegler R, Scott J (editors) *Polity Press* Oxford UK.
- 121.** Wilson R J 1976 Unlocking interlocks: The on-again off again saga of Section 8 of the Clayton Act *Antitrust Law Journal* **45** p 317.
- 122.** Hughes M, John S, Mackenzie J 1977 Trends in interlocking directorships: An international comparison *Acta Sociologica* vol **20** Issue 3 pp 287 – 292.
- 123.** Tukey J W 1977 Exploratory data analysis *Addison-Wesley* USA.
- 124.** Freeman L 1979a Centrality in social networks: A conceptual clarification *Social Networks* **1** pp 215 – 239.
- 125.** Freeman L 1979b Visualizing social networks *School of Social Sciences* University of California Irvine California USA.
- 126.** Koenig T, Gogel R, Sonquist J 1979 Models of the significance of interlocking corporate directorates *American Journal of Economics, Sociology* **38** pp 173 – 186.
- 127.** Mokken R J 1979 Cliques, clubs and clans *Quality and Quantity* **13** pp 161 – 173.
- 128.** Burt R S 1980 Cooptive corporate actor networks: A reconsideration of interlocking directorates involving American manufacturing *Administrative Science Quarterly* **25** pp 557 – 582.
- 129.** Burt R S 1997 The contingent value of social capital *Administrative Science Quarterly* **42** pp 339 – 365.
- 130.** Pennings J M 1980 Interlocking directorates *Jossey-Bass* San Francisco California USA.
- 131.** Radcliff R 1980 Banks and corporate lending: An analysis of the impact of the internal structure of the capitalist class on the lending behavior of banks *American Sociological Review* **45** pp 553 – 570.
- 132.** Boje D M, Whetten D A 1981 Effects of organizational strategies and constraints on centrality and attributions of influence in interorganizational networks *Administrative Science Quarterly* **26** pp 378 – 395.
- 133.** Mintz B, Schwartz M 1981 Interlocking directorates and interest group formation *American Sociological Review* **46** (6) pp 851 – 869.
- 134.** Mintz B, Schwartz M 1985 The power structure of American business *University of Chicago Press* Chicago Illinois USA.

- 135.** Mizruchi M S, Bunting D 1981 Influence in corporate networks: An examination of four measures *Administrative Science Quarterly* **26** pp 475 – 489.
- 136.** Mizruchi M S 1982 The American corporate network: 1904–1974 *Sage Publications* Beverly Hills California USA.
- 137.** Stearns L B, Mizruchi M S 1986 Broken-tie reconstitution and the functions of interorganizational interlocks: A reexamination *Administrative Science Quarterly* **31** pp 522 – 538.
- 138.** Mizruchi M S, Schwartz M (editors) 1987 Intercorporate relations: The structural analysis of business *Cambridge University Press* Cambridge UK.
- 139.** Mizruchi M S, Stearns L B 1988 A longitudinal study of the formation of interlocking directorates *Administrative Science Quarterly* **33** pp 194 – 210.
- 140.** Mizruchi M S 1992 The structure of corporate political action *Harvard University Press* Cambridge USA.
- 141.** Mizruchi M S, Stearns L B 1994 A longitudinal study of borrowing by large American corporations *Administrative Science Quarterly* **39** pp 118 – 140.
- 142.** Mizruchi M S 1996 What do interlocks do? An analysis, critique, and assessment of research on interlocking directorates *Annual Review of Sociology* **22** pp 271 – 298.
- 143.** Byrd D T, Mizruchi M S 2005 Bankers on the board, the debt ratio of firms *Journal of Corporate Finance* **11** pp 129 – 173.
- 144.** Schoorman F D, Bazerman M H, Atkin R S 1981 Interlocking directorates: A strategy for reducing environmental uncertainty *Academy of Management Review* **6** pp 243 – 251.
- 145.** Mariolis P, Jones M H 1982 Centrality in corporate interlock networks: Reliability and stability *Administrative Science Quarterly* **27** pp 571 – 585.
- 146.** Barnes J A 1983 Graph theory in network analysis *Social Networks* vol **5** pp 235 – 244.
- 147.** Burt R S 1983 Corporate profits and cooptation *Academic Press* New York USA.
- 148.** Dodd P, Warner J 1983 On corporate governance *Journal of Financial Economics* **11** pp 401 – 438.
- 149.** Palmer D 1983 Broken ties: Interlocking directorates and inter-corporate coordination *Administrative Science Quarterly* **28** pp 40 – 55.
- 150.** Roy W 1983 The interlocking directorate structure of the United States *American Sociological Review* **42** pp 248 – 257.
- 151.** Vance S C 1983 Corporate leadership: Boards, directors, and strategy *Mc Graw-Hill* New York USA.

152. American Bar Association 1984 Section on Antitrust Law Monograph **10** Interlocking Directorates under Section 8 of Clayton Act. *Task force on interlocking directorates* Washington USA.
153. American Bar Association 2011 Interlocking directorates *Handbook on Section 8 of the Clayton Act* Washington USA.
154. Lease R C, McConnell J J, Mikkelson W H 1984 The market value of differential voting rights in closely held corporations *Journal of Business* vol **57** (4) pp 443 – 467.
155. Ornstein M 1984 Interlocking directorates in Canada: Inter-corporate or class alliance *Administrative Science Quarterly* **29** pp 210 – 231.
156. Scott J, Griff C 1984 Directors of industry: The British corporate networks 1904–76 *Polity Press* Cambridge USA.
157. Useem M 1984 The inner circle *Oxford University Press* New York USA.
158. Wasserman S, Faust K 1994 Social network analysis: Method and application *Cambridge University Press* Cambridge UK.
159. Ziegler R 1984 Das Netz der Personen- und Kapitalverflechtungen Deutscher und Österreichischer Wirtschaftsunternehmen *Kölner Zeitschrift für Soziologie und Sozialpsychologie* **36** pp 585 – 614.
160. Baysinger R, Butler H 1985 Corporate governance and the board of directors: Performance effects of changes in board composition *Journal of Law, Economics and Organization* **1** pp 101 – 124.
161. Baysinger B, Hoskisson R E 1990 The composition of boards of directors and strategic control: Effects on corporate strategy *Academy of Management Review* **15** pp 72 – 87.
162. Bearden J, Mintz B 1985 Regionality and integration in the American interlock network in Networks of corporate power Stokman F N, Ziegler R, Scott J (editors) *Polity Press* Cambridge UK.
163. Demsetz D, Lehn K 1985 The structure of corporate ownership: Causes and consequences *Journal of Political Economy* **93-6** pp 1155 – 1177.
164. Galaskiewicz J, Wasserman S, Rauschenbach B, Bielefeld W, Mullaney P 1985 The influence of corporate power, social status, and market position on corporate in a regional network *Social Forces* **64** (2) pp 401 – 431.
165. Meeusen W, Cuyvers L 1985 The interaction between interlocking directorships, the economic behaviour of companies in Networks of corporate power: A comparative analysis of ten countries Stokman F N, Ziegler R, Scott J (editors) *Polity Press* Oxford UK.

- 166.** Stokman F N, Wasseur F W 1985 National networks in 1976: A structural comparison *in* Networks of corporate power: A comparative analysis of ten countries Stokman F N, Ziegler R, Scott J (editors) *Polity Press* Cambridge UK pp 20 – 44.
- 167.** Stokman F N, van der Knoop J, Wasseur F W 1990 Interlocks in the Netherlands: Stability and careers in the period 1960-1980 *in* The sociology of elites vol **III** Interlocking directorships and corporate networks.
- 168.** Mace M 1986 Directors: Myth and reality *Harvard Business School Press* Boston MA USA.
- 169.** Glatthard A 1987 Unternehmenskonzentration in der Schweiz; Stand und Entwicklung von 1929 bis 1983 *Peter Lang Verlag* Bern Switzerland.
- 170.** Richardson R J 1987 Directorship interlocks, corporate profitability *Administrative Science Quarterly* **32** pp 367 – 386.
- 171.** Hermalin B, Weisbach M 1988 The determinants of board composition *Rand Journal of Economics* **19** pp 589 – 606.
- 172.** Hermalin B, Weisbach M 1998 Endogenously chosen boards of directors and their monitoring of the CEO *American Economic Review* **88** pp 96 – 118.
- 173.** Hill C W L, Snell S A 1988 External control, corporate strategy, and firm performance in research intensive industries *Strategic Management Journal* **9** pp 577 – 590.
- 174.** Kesner I F 1988 Directors characteristics and committee ship: An investigation of type, occupation, tenure and gender *Academy of Management Journal* **30** pp 66 – 84.
- 175.** Zajac E J 1988 Interlocking directorates as an inter-organizational strategy: A test of critical assumptions *Academy of Management Journal* **31** (2) pp 428 – 438.
- 176.** Zajac E J, Westphal J D 1996 Director reputation, CEO-board power, and the dynamics of board interlocks *Administrative Science Quarterly* **41** pp 507 – 529.
- 177.** Weisbach M 1988 Outside directorships and CEO turnover *Journal of Financial Economics* **20** pp 431 – 460.
- 178.** Fosberg R 1989 Outside directors and managerial monitoring *Akron Business and Economic Review* **20** pp 24 – 32.
- 179.** Lorsch J, MacIver E 1989 Pawns or potentates: The reality of America's corporate boards *Harvard Business School Press* Boston MA USA.
- 180.** Nelson R E 1989 The strength of strong ties: Social networks and intergroup conflict in organizations *Organization Studies* **10** (2) pp 207 – 224.
- 181.** Singh H, Harianto F 1989 Management-board relationships, takeover risk, and the adoption of golden parachutes *Academy of Management Journal* **32** pp 7 – 24.

- 182.** Zahra S A, Pearce J A 1989 Boards of directors and corporate financial performance: A review and integrative model *Journal of Management* **15** pp 291 – 344.
- 183.** Gilson S 1990 Bankruptcy, boards, banks, and block-holders: Evidence on changes in corporate ownership and control when firms default *Journal of Financial Economics* **27** pp 355 – 387.
- 184.** Glaus B U 1990 Unternehmensüberwachung durch schweizerische Verwaltungsräte – Theoretische Grundlagen, rechtliche Anforderungen, Aufgabenwahrnehmung in Wirklichkeit und Gestaltungsempfehlungen *Doctoral Dissertation* Hochschule St Gallen Switzerland.
- 185.** Kaplan S N, Reishus D 1990 Outside directorships and corporate performance *Journal of Financial Economics* **27** pp 389 – 410.
- 186.** Kaplan S N, Minton B A 1994 Appointments of outsiders to Japanese boards: Determinants and implications for managers *Journal of Financial Economics* **36** pp 225 – 258.
- 187.** Powell W 1990 Neither market nor hierarchy: Networks form of organizations *Research in Organizational Behavior* **12** pp 295 – 336.
- 188.** Rosenstein S, Wyatt J 1990 Outside directors, board independence, and shareholder wealth *Journal of Financial Economics* **26** pp 175 – 191.
- 189.** Rosenstein S, Wyatt J 1994 Shareholder wealth effects when an officer of one corporation joins the board of directors of another *Managerial and Decision Economics* **15** pp 317 – 327.
- 190.** Rosenstein S, Wyatt J G 1997 Inside directors, board effectiveness, and shareholder wealth *Journal of Financial Economics* **44** pp 229 – 250.
- 191.** Burris V 1991 Director interlocks and the political behavior of corporations and corporate elites *Social Science Quarterly* vol **72** (3) pp 537 – 551.
- 192.** Davis G F 1991 Agents without principles? The spread of the poison pill through the intercorporate network *Administrative Science Quarterly* vol **36** pp 583 – 613.
- 193.** Davis G F, Greve H R 1997 Corporate elite networks and governance changes in the 1980s *American Journal of Sociology* **103** pp 1 – 37.
- 194.** Davis G F, Yoo M, Baker W E 2002 The network topography of the American corporate elite 1982-2001 *Working Paper* Business School University of Michigan USA.
- 195.** Davis G F, Yoo M, Baker W E 2003 The small world of American corporate elite, 1982-2001 *Strategic Organization* vol **1** (3) pp 301 – 326.
- 196.** Davis G F, Yoo M, Vast E December 2003 Le monde toujours plus petit des grandes entreprises Americaines *Gerer et Comprendre*.

197. Goodstein J, Boeker W 1991 Turbulence at the top: A new perspective on governance structure changes and strategic change *Academy of Management Journal* **34** pp 306 – 330.
198. Hermalin B, Weisbach M 1991 The effects of board composition and direct incentives on firm performance *Financial Management* **20** pp 101 – 112.
199. Hermalin B, Weisbach M 2001 Board of directors as an endogenously determined institution: A survey of the economic literature *Working Paper*.
200. Byrd J, Hickman k 1992 Do outside directors monitor managers? Evidence from tender offer bids *Journal of Financial Economics* **32** pp 195 – 221.
201. Demb A, Neubauer F F 1992 The corporate board: Confronting the paradoxes *Oxford University Press* NY USA.
202. Fligstein N, Brantley P 1992 Bank control, owner control, or organizational dynamics: Who controls the large modern corporation? *American Journal of Sociology* **98** pp 280 – 307.
203. Gerlach M L 1992 The Japanese corporate network: A blockmodel analysis *Administrative Science Quarterly* **37** (1) pp 105 – 139.
204. Judge W Q, Zeithaml C P 1992 Institutional and strategic choice perspectives on board involvement in the strategic decision making process *Academy of Management Journal* **35** pp 766 – 794.
205. Lee C I, Rosenstein S, Rangan N, Davidson III W N 1992 Board composition and shareholder wealth: The case of management buyouts *Financial Management* **21** pp 58 – 72.
206. Lincoln J R, Gerlach M L, Takahashi P 1992 Keiretsu networks in the Japanese economy: A dyad analysis of intercorporate ties *American Sociological Review* **57** pp 561 – 585.
207. Lipton M, Lorsch J 1992 A modest proposal for improved corporate governance *Business Lawyer* **59** pp 59 – 77.
208. Mallette P, Fowler K L 1992 Effects of board composition and stock ownership of the adoption of “poison pills” *Academy of Management Journal* **35** pp 1010 – 1035.
209. Milgrom P, Roberts J 1992 Organization and management *Prentice Hall* NJ USA.
210. Pearce II J A, Zahra S A 1992 Board composition from a strategic contingency perspective *Journal of Management Studies* **29** pp 411 – 438.
211. Pettigrew A M 1992 On studying managerial elites *Strategic Management Journal* **13** pp 163 – 182.
212. Smith C, Watts R 1992 The investment opportunity set and corporate financing, dividend, and compensation policies *Journal of Financial Economics* **32** pp 263 – 292.

213. Daily C M, Dalton D R 1993 Board of directors leadership and structure: Control and performance implications *Entrepreneurship: Theory and Practice* **17** (3) pp 65 – 82.
214. Daily C M, Dalton D R 1994 Bankruptcy and corporate governance: The impact of board composition and structure *Academy of Management Journal* **37** (6) pp 1603 – 1617.
215. Daily C M, Dalton D R 1997 CEO and board chair roles, held jointly or separately: Much ado about nothing? *Academy of Management Executive* **11** (3) pp 11 – 20.
216. Dalton D R, Daily C M, Ellstrand A E, Johnson J L 1998 Meta-analytic reviews of board composition, leadership structure, and financial performance *Strategic Management Journal* **19** pp 269 – 290.
217. Dalton D R, Daily C M, Johnson J L, Ellstrand A E 1999 Number of directors and financial performance: A meta-analysis *Academy of Management Journal* **42** (6) pp 674 – 686.
218. Jensen M C 1993 The modern industrial revolution, exit, and the failure of internal control systems *Journal of Finance* **48** pp 831 – 880.
219. Johnson R A, Hoskisson R E, Hitt M A 1993 Board of directors' involvement in restructuring: The effects of board versus managerial controls and characteristics *Strategic Management Journal* **14** pp 33 – 50.
220. Haunschild P R 1993 Interorganizational imitation: The impact of interlocks on corporate acquisition activity *Administrative Science Quarterly* **38** pp 564 – 592.
221. Haunschild P R, Beckman Ch M 1998 When do interlocks matter? Alternate sources of information and interlock influence *Administrative Science Quarterly* **43** pp 815 – 844.
222. Kester C W 1993 Banks in the boardroom: Germany, Japan and the United States in *Financial services: Perspectives and challenges* Samuel L Hayess III (editor) *Harvard Business School Press* Boston Massachusetts USA.
223. Millstein I M 1993 The evolution of the certifying board *Business Law* **48** p 1485.
224. Shivdasani A 1993 Board composition, ownership structure and hostile takeovers *Journal of Accounting and Economics* **16** pp 167 – 198.
225. Shivdasani A, Yermack D 1999 CEO involvement in the selection of new board members: An empirical analysis *Journal of Finance* **54** pp 1829 – 1854.
226. Barnhart S W, Marr M W, Rosenstein S 1994 Firm performance and board composition: Some new evidence *Managerial and Decision Economics* **15** pp 329 – 340.
227. Brickley J, Coles J, Terry R 1994 Outside directors and the adoption of poison pills *Journal of Financial Economics* **35** pp 371 – 390.

228. Brickley J, Coles J, Linck J 1999 What happens to CEOs after they retire? New evidence on career concerns, horizon problems, and CEO incentives *Journal of Financial Economics* **52** pp 341 – 377.
229. Goodstein J, Gautam K, Boeker W 1994 The effects of board size and diversity on strategic change *Strategic Management Journal* **15** pp 241 – 250.
230. Huse M 1994 Board-management relations in small firms: The paradox of simultaneous independence and interdependence *Small Business Economics* **6** pp 55 – 72.
231. Krackhardt D 1994 Graph theoretical dimensions of informal organizations in *Computational organization theory* Carley K M, Prietula M J (editors) *Lawrence Erlbaum Ass Hillsdale USA*.
232. Tricker R I 1994 *International corporate governance: Text, readings and cases* Prentice-Hall Singapore.
233. Wasserman S, Galaskiewicz J 1994 *Advances in social network analysis: Research in the social and behavioral sciences* Thousand Oaks Sage California USA.
234. Wasserman S, Faust K 1994 *Social network analysis* Cambridge University Press Cambridge UK.
235. Wasserman S, Faust K, Iacobucci D 1994 *Social network analysis: Methods and applications* Cambridge University Press Cambridge UK.
236. Benassi M 1995 Governance factors in a network process approach *Scandinavian Journal of Management* **11** pp 269 – 281.
237. Fligstein N 1995 Networks of power or the finance conception of control? Comment on Palmer, Barber, Zhou, and Soysal *American Sociological Review* **60** pp 500 – 503.
238. Hallock K January 1995 Executive pay and reciprocal interlocking boards of directors *Working Paper no 340* Industrial Relations Section Princeton University USA pp 1 – 57.
239. Hill S 1995 The social organization of boards of directors *British Journal of Sociology* **46** (2) pp 245 – 278.
240. Kini O, Kracaw W, Mian S 1995 Corporate takeovers, firm performance, and board composition *Journal of Corporate Finance* **1** pp 383 – 412.
241. Klein A 1995 An examination of board committee structures *Working Paper*.
242. Lorsch J W January- February 1995 Empowering the boards *Harvard Business Review* pp 107 – 117.
243. Moerland P W 1995 Alternative disciplinary mechanisms in different corporate systems *Journal of Economic Behavior and Organization* **26** pp 17 – 34.

244. Moerland P W 1997 Corporate governance: Theorie en praktijk in internationaal perspectief Wolters-Noordhoff Groningen The Netherlands.
245. Moerland P W 1999 Corporate supervision in the Netherlands *Convergence and Diversity in Corporate Governance Regimes and Capital Markets Conference* Tilburg University The Netherlands.
246. Monks R, Minow N 1995 Corporate governance *Basil Blackwell* Cambridge USA.
247. O'Neal D, Thomas H 1995 Directors networks/director selection: The board's strategic role *European Management Journal* **13** (1) pp 79 – 90.
248. Pfannschmidt A 1995 Mehrfachmandate in deutschen Unternehmen *Zeitschrift für Betriebswirtschaft* **65** pp 177 – 203.
249. Wunderer F R 1995 Der Verwaltungsrats-Präsident *Ph. D. Dissertation* Hochschule St Gallen *Schulthess Polygraphischer Verlag* Zürich Switzerland.
250. Agrawal A, Knoeber C R 1996 Firm performance and mechanism to control agency problems between managers and shareholders *Journal of Financial and Quantitative Analysis* **31** pp 377 – 397.
251. Beasley M S 1996 An empirical analysis of the relation between the board of director composition and financial statement fraud *Accounting Review* **71** pp 443 – 455.
252. Bhagat S, Black B May 10-11 1996 Do independent directors matter? *The American Law and Economics Association Meeting* Chicago USA.
253. Bhagat S, Black B 1998 The uncertain relationship between board composition and firm performance *Columbia Law School Sloan Project* New York USA pp 291 - 316.
254. Bhagat S, Black B 1999 The uncertain relationship between board composition and firm performance *Business Law Review* vol **54** p 921 – 963.
255. Bhagat S, Black B 2002 The non-correlation between board independence and long-term firm performance *Journal of Corporation Law* **27** pp 231 – 273.
256. Booth J, Deli D 1996 Factors affecting the number of outside directorships held by CEOs *Journal of Financial Economics* **40** pp 81 – 104.
257. Booth J, Deli D 1999 On executives of financial institutions as outside directors *Journal of Corporate Finance* **5** pp 227 – 250.
258. Borokhovich K, Parrino R, Trapani T 1996 Outside directors and CEO selection *Journal of Financial and Quantitative Analysis* **3** pp 337 – 335.
259. De Cecco M, Ferri G 1996 Le banche d'affari in Italia *Il Mulino* Bologna Italy.
260. Doz Y 1996 The evolution of cooperation in strategic alliances: Initial conditions or learning processes? *Strategic Management Journal* **17** pp 55 – 83.

261. Park S, Rozeff M 1996 The role of outside shareholders, outside boards, and management entrenchment in CEO selection *Working Paper* SUNY Buffalo NY USA.
262. Sundaramurthy C 1996 Corporate governance within the context of antitakeover provisions *Strategic Management Journal* **17** pp 377 – 394.
263. Sundaramurthy C, Mahoney J M, Mahoney J T 1997 Board structure, antitakeover provisions, and stockholder wealth *Strategic Management Journal* **18** (3) pp 231 – 245.
264. Yermack D 1996 Higher market valuation of companies with a small board of directors *Journal of Financial Economics* **40** pp 185 – 211.
265. West D B 1996 Introduction to graph theory *Prentice Hall* Upper Saddle River NJ USA.
266. Williamson O E 1996 The mechanisms of governance *Oxford University Press* New York USA.
267. Bianco M, Pagnoni E 1997 I Legami creati tra le societa quotate dagli interlocking directorates: Il caso delle banche *Quaderni di Moneta e Credito* Banca Nazionale del Lavoro Italy.
268. Cotter J, Shivdasani A, Zenner M 1997 Do independent directors enhance target shareholder wealth during tender offers? *Journal of Financial Economics* **43** pp 195 – 218.
269. Davies P L, Gower L C B 1997 Gower's principles of company law 6th edition *Sweet & Maxwell* ISBN-10: 0421524804 ISBN-13: 978-0421524804 pp 1 – 976.
270. Hallock K 1997 Reciprocally interlocking boards of directors and executive compensation *Journal of Financial and Quantitative Analysis* **32** pp 331 – 344.
271. John K, Senbet L W 1997 Corporate governance and board effectiveness *Working Paper* New York University NY USA.
272. Loderer C, Martin K 1997 Executive stock ownership and performance: Tracking faint traces *Journal of Financial Economics* **45** pp 223 – 255.
273. Loderer C, Peyer U September 5 2001, 2002 Board overlap, seat accumulation, and share prices *Social Science Research Network* USA SSRN-id273465.pdf, *European Financial Management* **8** pp 165 – 192.
274. Podolny J M, Baron J N 1997 Resources and relationships: Social networks and mobility in the workplace *American Sociological Review* **62** pp 673 – 693.
275. Rowley T J 1997 Moving beyond dyadic ties: A network theory of stakeholder influences *Academy of Management Review* issue **22** (4) pp 887 – 910.
276. Rowley T J 1998 Social network analysis in action: Using social network methodologies in stakeholder research *Proceedings of the 9th Annual Meeting of the International Association for Business and Society*.

277. Elms H, Berman S L, Rowley T J 2000 Network influences on CEO compensation *Proceedings for the 11th Annual International Association for Business & Society* Vermont USA.
278. Rowley T J, Behrens D, Krackhardt D 2000 Redundant governance structures: An analysis of structural and relational embeddedness in the steel and semiconductor industries *Strategic Management Journal* **21** pp 369 – 386.
279. Rowley T J June 3, 2005a Invited talk on Canadian directors networks *Rotman School of Management Alumni Meeting 2005* Fairmont Royal York Hotel Toronto Canada.
280. Rowley T J June 3, 2005b Private communications on the directors networks in board of directors of North American corporations *Rotman School of Management Alumni Meeting 2005* Fairmont Royal York Hotel Toronto Canada.
281. Rowley T J, Baum J 2008 The dynamics of network position *Network Strategy (Advances in Strategic Management)* vol **24**.
282. Shleifer A, Vishny R 1997 A survey of corporate governance *Journal of Finance* vol **52** pp 737 – 783.
283. Tufano P, Sevick M 1997 Board structure and fee-setting in the US mutual fund industry *Journal of Financial Economics* **46** pp 321 – 355.
284. Miller G T March 26 1997 Interlocking directorates and the antitrust laws *Colorado Lawyer* **53**.
285. Uzzi B 1997 Social structure and competition in inter-firm networks: The paradox of embeddedness *Administrative Science Quarterly* **42** pp 35 – 67.
286. Bollobas 1998 Modern graph theory *Springer-Verlag* New York USA.
287. Charan R 1998 Boards at work: How corporate boards create competitive advantage *Jossey-Bass* San Francisco USA.
288. Collin S-O 1998 Why are these islands of conscious power found in the ocean of ownership? Institutional, governance hypotheses explaining the existence of business groups in Sweden *Journal of Management Studies* **35** pp 719 – 746.
289. Denis D J, Sarin A 1998 Ownership and board structures in publicly traded corporations *Working Paper* Purdue University France.
290. Eisenberg Th, Sundgren S, Wells M T 1998 Larger board size and decreasing firm value in small firms *Journal of Financial Economics* **48** pp 35 – 54.
291. Fried V H, Bruton G D, Hisrich R D 1998 Strategy and the board of directors in venture capital-backed firms *Journal of Business Venturing* **13** pp 493 – 503.

292. Gulati R 1998 Alliances and networks *Strategic Management Journal Special Issue* **19** (4) pp 293 – 317.
293. Gulati R, Singh H 1998 The architecture of cooperation: Managing coordination uncertainty and interdependence in strategic alliances *Administrative Science Quarterly* **43** pp 781 – 814.
294. Gulati R 1999 Network location and learning: The influence of network resources and firm capabilities on alliance formation *Strategic Management Journal* **20** pp 397 – 420.
295. Gulati R, Garguilo M 1999 Where do networks come from? *American Journal of Sociology* **104** pp 1439 – 1493.
296. Gulati R, Westphal J D 1999 Cooperative or controlling? The effects of CEO-board relations and the content of interlocks on the formation of joint ventures *Administrative Science Quarterly* **44** pp 473 – 506.
297. Haunschild P R, Beckman C M 1998 When do interlocks matter? Alternate sources of information and interlock influence *Administrative Science Quarterly* vol **43** no 4 pp 815 – 844.
298. Hermalin B E, Weisbach M S 1998 Endogenously chosen boards of directors and their monitoring of the CEO *American Economic Review* vol **88** pp 96 – 118.
299. Hermalin B E, Weisbach M S 2003 Boards of directors as an endogenously determined institution: A survey of the economic literature *Working Paper Series Paper no 3* Centre for Responsible Business University of California Berkeley USA.
300. Hopt K J, Kanada H, Roe M J, Wymeersch E, Prigge S (editors) 1998 Comparative corporate governance - The state of the art and emerging research *Clarendon* Oxford UK.
301. Hopt K J 1998 The German two-tier board: Experience, theories, reforms *in* Comparative corporate governance: The state of the art and emerging research Hopt K J (editor) Clarendon USA
http://papers.ssrn.com/sol3/papers.cfm?abstract_id=159555 .
302. Hopt K J, Leyens P C 2004 Board models in Europe – Recent developments of internal corporate governance structures in Germany, the United Kingdom, France, and Italy *ECGI Law Working Paper no 18/2004*.
http://papers.ssrn.com/sol3/papers.cfm?abstract_id=487944 .
303. Hung H 1998 A typology of the theories of the roles of governing boards *Corporate Governance: An International Review* **6** (2) pp 101 – 111.
304. Everett M G, Borgatti S P 1998 Analyzing clique overlap *Connections* **21** (1) pp 49 – 61.

305. Khanna T, Gulati R, Nohria N 1998 The dynamics of learning alliances: Competition, cooperation, and relative scope *Strategic Management Journal* **19** pp 193 – 210.
306. Klein A 1998a Firm productivity and board committee structure *Journal of Law and Economics* vol **41** pp 137 – 165.
307. Klein A 1998b Affiliated directors: Puppets of management or effective directors *Working Paper* Stern School of Business New York University NY USA.
308. La Porta R, Lopez de Silanes F, Shleifer A, Vishny R W 1998 Law and finance *Journal of Political Economy* **106** pp 1113 – 1155.
309. Mac Canna L, Brennan N, O'Higgins 1998 National networks of corporate power: An Irish perspective *Journal of Management and Governance* vol **2** no 4 pp 357 – 379.
310. Sanders W M G, Carpenter M A 1998 Internationalization and firm governance: The role of CEO compensation, top management team composition, and board structure *Academy of Management Journal* **41** (2) pp 158 – 178.
311. Spencer S 1998 The Netherlands board index 3rd edition Amsterdam The Netherlands.
312. Stuart T E 1998 Network positions and propensities to collaborate: An investigation of strategic alliance formation in a high-technology industry *Administrative Science Quarterly* **43** pp 668 – 698.
313. Wagner J A III, Stimpert J L, Fubara E I 1998 Board composition and organizational performance: Two studies of insider/outsider effects *Journal of Management Studies* **35** (5) pp 655 – 677.
314. Watts D J, Strogatz S H 1998 Collective dynamics of small-world networks *Nature* **393** pp 440 – 442.
315. Watts D J 1999a Small worlds *Princeton University Press* Princeton New Jersey USA.
316. Watts D J 1999b Worlds. The dynamics of networks between order and randomness.
317. Watts D J 1999c Networks, dynamics, and the small world phenomenon *American Journal of Sociology* **105** pp 493 – 527.
318. Barabasi A, Albert R 1999 Emergence of scaling in random networks *Science* vol **286** pp 509 – 512.
319. Barabasi A 2002 Linked *Perseus Publishing* Cambridge MA USA.
320. Borgatti S P, Everett M 1999 Models of core/periphery structures *Social Networks* **21** pp 375 – 395.
321. Borgatti S P 2002 Basic social network concepts *AoM PDW* Denver CO USA.
322. Borgatti S P, Everett M G, Freeman L C 2002 Ucinet for Windows: Software for social network analysis *Analytic Technologies* Harvard MA USA.

323. Borgatti S P, Foster P C 2003 The network paradigm in organizational research: A review and typology *Journal of Management* **29** (6) pp 991 – 1013.
324. Borgatti S P 2005 Centrality and network flow *Social Networks* **27** pp 55 – 71.
325. Borgatti S P 2006 Identifying sets of key players in a social network *Computational and Mathematical Organization Theory* **12** pp 21 – 34.
326. Carroll W K, Malcolm A August 1999 Finance capital and capitalists class integration in the 1990s: Networks of interlocking directorships in Canada and Australia *Canadian Review of Sociology & Anthropology* vol **36** issue 3 pp 331 – 354.
327. Core J, Holthausen R, Larcker D 1999 Corporate governance, CEO compensation, and firm performance *Journal of Financial Economics* **51** pp 371 – 406.
328. Davies A 1999 A strategic approach to corporate governance *Gower* Cambridge UK.
329. Fohlin C 1999 The rise of interlocking directorates in imperial Germany *Economic History Review* **52** (2) pp 307 – 333.
330. Forbes D P, Milliken F J 1999 Cognition and corporate governance: Understanding boards of directors as strategic decision-making groups *Academy of Management Review* **24** pp 489 – 505.
331. Maassen G F 1999 An international comparison of corporate governance models Ph D dissertation *Erasmus University* Rotterdam The Netherlands.
332. MacAvoy P S, Millstein M 1999 The active board of directors and its effects on the performance of the large publicly traded corporation *Journal of Applied Corporate Finance* vol **11** (4) pp 8 – 20.
333. Maman D 1999 Interlocking ties within business groups in Israel – A longitudinal analysis, 1974-1987 *Organization Studies* **20** pp 323 – 339.
334. Maman D 2001 The organizational connection: Social capital, the career expansion of directors of business groups in Israel *Social Science Research* **30** pp 578 – 605.
335. Postma Th, van Ees H, Garretsen H, Sterken E 1999 Top management team and board characteristics and firm performance in The Netherlands *SOM - Research Report 99* Groningen The Netherlands.
336. Shivdasani A, Yermack D 1999 CEO involvement in the selection of new board members: An empirical analysis *Journal of Finance*
http://pages.stern.nyu.edu/~eofek/PhD/papers/SY_CEO_JF.pdf .
337. Vafeas N 1999 Board meeting frequency and firm performance *Journal of Financial Economics* **53** pp 113 – 142.

338. van Manen J, Hooghiemstra R B H 1999 Supervisory directors in the Netherlands: An expectations gap *Corporate Governance: Evidence from the Netherlands Workshop* University of Groningen The Netherlands.
339. Adams R B 2000 The dual role of corporate boards as advisors and monitors of management *Working Paper* Federal Reserve Bank of New York NY USA.
340. Barbi V 2000 Interlocking directorship networks: What is relevant for the evolution and change of the networks? *Working Paper no 278* Department of Economics University of Siena Italy
<http://ssrn.com/abstract=223543> .
341. Blackhurst C 2000 Would Sir care for another directorship? *Management Today* **5** pp 68 – 71.
342. Dyer J H, Noboeka K 2000 Creating and managing a high performance knowledge-sharing network: The Toyota case *Strategic Management Journal* **21** PP 345 – 368.
343. Fich E 2000 Do directors who are CEOs of other firms enhance firm performance? *UNC Working Paper* University of North Carolina NC USA.
344. Gargiulo M, Gulati R January 2000 Where do inter-organizational networks come from? *American Journal of Sociology*.
345. Gulik E H M, Gedajlovic E R, Maassen G F, Bosch F A J van den, Volberda H W July 8-11 2000 On the service role of boards of directors: Pfeffer (1972) across contexts *ASAC-IFSAM Conference* Montreal Canada.
346. Kracaw W, Zenner M 2000 Bankers in the boardroom: Good news or bad news? *UNC Working Paper*.
347. Miwa Y, Ramseyer M 2000 The value of prominent directors: Lessons in corporate governance from transition Japan *University of Tokyo, Harvard University* Japan, USA.
348. Robert III H M, Evans W J, Honemann D H, Balch Th J October 1 2000 Robert's rules of order newly revised *Da Capo Press* Cambridge MA USA ISBN 0-7382-0307-6.
349. Scott J 2000 Social network analysis: A handbook 2nd edition *Sage Publications* London UK.
350. Ward R D 2000 Improving corporate boards *John Wiley and Sons Inc* Canada.
351. Ferri G, Masciandaro D, Messori M 2001 Corporate governance, board turnover and performance: The case of local banks in Italy *Paolo Baffi Centre Working Paper no 01-150* Italy.
352. Ferris S, Jagannathan M 2001 The incidence and determinants of multiple corporate directorships *Applied Economics Letters* **8** pp 31 – 35.

353. Ferris S, Jagannathan M, Pritchard A 2002 Too busy to mind the business? Monitoring by directors with multiple board appointments *Journal of Finance*.
354. Ferris S P, Jagannathan M, Pritchard A 2003 Too busy to mind the business? Monitoring by directors with multiple board appointments *Journal of Finance* vol **58** pp 1087 – 1111.
355. Heracleous L, Murray J 2001 Networks, interlocking directors and strategy: Toward a theoretical framework *Asia Pacific Journal of Management* **18** pp 137 – 160.
356. Kroszner R, Strahan P 2001a Throwing good money after bad? Board connections and conflicts in bank lending *NBER Working Paper 8694* NBER USA.
357. Kroszner R, Strahan P 2001b Bankers on boards: Monitoring, conflicts of interest, and lender liability *Journal of Financial Economics* **62** pp 415 – 452.
358. Newman M E J, Strogatz S, Watts D 2001 Random graphs with arbitrary degree distribution and their applications *Physical Review* **64** pp 1 – 18.
359. Newman M E J 2003 The structure and function of complex networks *SIAM Review* **45** p 167.
360. Newman M E J 2007 The mathematics of networks in *The new Palgrave encyclopedia of economics* 2nd edition Blume L E, Durlauf S N (editors) *Palgrave Macmillan* Basingstoke UK.
361. Okazaki T, Yokoyama K October 2001 Measuring the extent and implications of director interlocking in the pre-war Japanese banking industry *Discussion Paper CIRJE-F-138* University of Tokyo Japan pp 1 – 47.
362. Postma Th, van Ees H 2001 On the functions of supervisory boards in the Netherlands *Department of Strategic Management Faculty of Management and Organization University of Groningen* The Netherlands pp 1 – 28.
363. Snijders T A B 2001 The statistical evaluation of social network dynamics *Sociological Methodology* **31** (1) p 361.
364. Snijders T A B 2003 Models for longitudinal network data *Working Paper*.
365. Tomka B 2001 Interlocking directorates between banks and industrial companies in Hungary at the beginning of the twentieth century *Business History* **43** (1) pp 25 – 42.
366. Watts A 2001 A dynamic model of network formation *Games and Economic Behavior* **34** pp 331 – 341.
367. Bainbridge S M 2002 Why a board? Group decision making in corporate governance *Vanderbilt Law Review* **55** pp 1 – 55.
368. Becht M, Bolton P, Roell A October 2002 Corporate governance and control www.ssrn.com .

369. Bianchi M, Bianco M, Enriques L 2002 Pyramidal groups and the separation between ownership and control in Italy *in* The control of corporate Europe Becht M, Barca F (editors) *Oxford Scholarship Online Monographs* Oxford UK.
370. Bianchi M, Bianco M, Giacomelli S, Paces A M, Trento S 2005 Proprieta e controllo delle imprese in Italia *Il Mulino* Bologna Italy.
371. Bianchi M, Bianco M 2006 Italian corporate governance in the last 15 years: From pyramids to coalitions? *ECGI - Finance Working Paper no 144/2006* European Corporate Governance Institute.
372. Carver J 2002 Corporate boards that create value: Governing company performance from the boardroom *Jossey-Bass* USA.
373. Everard A, Henry R 2002 A social network analysis of interlocked directorates in electronic commerce firms *Electronic Commerce Research and Applications* **1** pp 225 – 234.
374. Hanna V, Walsh K 2002 Small firm networks: A successful approach to innovation? *R&D Management* **32** (3) pp 201 – 207.
375. Faccio M, Lang L H P 2002 The ultimate ownership of Western European corporations in *Journal of Financial Economics* **65** pp 365 – 395.
376. Perry T, Peyer U C September 2002, August 12 2005 Board seat accumulation by executives: A shareholder's perspective *Working Paper 2002/102/FIN* INSEAD Boulevard de Constance 77305 Fontainebleau Cedex France pp 1 – 44, *Journal of Finance* vol **60** issue 4 pp 2083 – 2123 DOI: 10.1111/j.1540-6261.2005.00788.x .
377. Volpin P 2002 Governance with poor investor protection: Evidence from top executive turnover *Journal of Financial Economics* **64** pp 61 – 90.
378. Dann L Y, Del Guercio D, Partch M 2003 Governance and boards of directors in closed-end investment companies *Journal of Financial Economics* **69** pp 111 – 148.
379. De B 2003 The incidence, performance effects of interlocking directorates in emerging market business groups: Evidence from India *Working Paper* Indira Gandhi Institute of Development Research India.
380. Fich E M, White L J 2003 CEO compensation and turnover: The effects of mutually interlocked boards *Wake Forest Law Review* vol **38** pp 935 – 959.
381. Fich E M, White L J 2005 Why do CEOs reciprocally sit on each other's boards? *Journal of Corporate Finance* vol **11** pp 175 – 195.
382. Fich E M, Shivdasani A 2006 Are busy boards effective monitors? *Journal of Finance* vol **61** pp 689 – 724.

383. Gillette A B, Noe T H, Rebello M J 2003 Corporate board composition, protocols, and voting behavior experimental evidence *Journal of Finance* **58** pp 1997 – 2033.
384. Hermalin B E, Weisbach M S 2003 Boards of directors as an endogenously determined institution: A survey of the economic literature *Economic Policy Review* pp 7 – 26.
385. Humphry Hung July 2003 A dual network model of interlocking directorates *Asian Academy of Management Journal* vol **8** no 2 pp 45 – 66.
386. Levy M, Loebbecke C, Powell P 2003 SMEs, co-opetition and knowledge sharing: The role of information systems *European Journal of Information Systems* **12** pp 3 – 17.
387. Malcolm A 2003 Boardroom networks among Australian company directors, 1976 and 1996: The impact of investor capitalism *Journal of Sociology* vol **39** (3) pp 231 – 251.
388. Ong Ch H, Wan D, Ong K-S October 2003 An exploratory study on interlocking directorates in listed firms in Singapore *Corporate Governance: An International Review* vol **11** pp 322 – 334
<http://ssrn.com/abstract=444344> .
389. Ornstein M 2003 The Canadian corporate network in comparative perspective *Comparative Sociology Brill Academic Publishers USA*.
390. Phan P H, Lee S H, Lau S C 2003 The performance impact of interlocking directorates: The case of Singapore *Journal of Managerial Issues* **15** pp 338 – 352.
391. Rodriguez J A, Cardenas J, Oltra C 2003 Networks of economic power in Europe *Working Paper*.
392. Yeo H-J, Pochet C, Alcouffe A 2003 CEO reciprocal interlocks in French corporations *Journal of Management and Governance* **7** pp 87 – 108.
393. Bebchuk L A, Cohen A, Ferrell A 2004 What matters in corporate governance *Harvard University Olin Discussion Paper no 491*.
394. Bebchuk L A, Cohen A 2005 The cost of entrenched boards *Journal of Financial Economics* **78** pp 409 – 433.
395. Bebchuk L A, Grinstein Y, Peyer U 2006 Lucky CEOs *Working Paper 12771* National Bureau of Economic Research Cambridge USA pp 1 – 62
<http://www.nber.org/papers/w12771> .
396. Bebchuk L A, Grinstein Y, Peyer U 2006 Lucky directors *Working Paper 12811* National Bureau of Economic Research Cambridge USA pp 1 – 54
<http://www.nber.org/papers/w12811> .
397. Bebchuk L A, Cremers M, Peyer U 2007 CEO centrality *Working Paper 3701* National Bureau of Economic Research Cambridge USA pp 1 – 49

<http://www.nber.org/papers/w13701> .

398. Battiston S, Catanzaro M 2004 Statistical properties of corporate board and director networks *European Physical Journal B* **38** pp 345 – 352.
399. Caldarelli G, Catanzaro M 2004 The corporate boards networks *Physica A* **338** pp 98 – 106.
400. Hakansson H, Lind J 2004 Accounting and network coordination *Accounting, Organizations and Society* **29** pp 51 – 72.
401. Heinze T 2004 Dynamics in the German system of corporate governance? Empirical findings regarding interlocking directorates *Economy and Society* **33** pp 218 – 238.
402. Levine R April 2004 The corporate governance of banks: A concise discussion of concepts and issues *in* Global Corporate Governance Forum Washington D C USA www.gcgf.org .
403. OECD 2004 Principles of corporate governance *OECD* www.oecd.org .
404. O'Hagan S B, Green M B 2004 Corporate knowledge transfer via interlocking directorates: A network analysis approach *Geoforum* **35** pp 127 – 139.
405. Rinaldi A June 25-26 2004 Business elites in Italy: 1913-1972 *Business and Society: The 2004 Conference of the Association of Business Historians* Nottingham UK.
406. Rinaldi A, Vasta M 2005 The structure of Italian capitalism, 1952-1972: New evidence using the interlocking directorates technique *Financial History Review* **12** (2) pp 173 – 198.
407. Robins G, Alexander M 2004 Small worlds among interlocking directors: Network structure and distance in bipartite graphs *Computational and Mathematical Organization Theory* **10** pp 69 – 94.
408. Stablein R, Cleland P, Mackie B, Reid D 2004 New Zealand exchange limited (nzx) boards and directors: It is a small world after all *Working Paper*.
409. Attig N, Morck R 2005 Boards, corporate governance in a typical country *Working Paper* University of Alberta Canada.
410. Carrington P J, Scott J, Wasserman S 2005 Models and methods in social network analysis *Cambridge University Press* Cambridge UK.
411. Chabi S, Maati J 2005 Le petit monde du CAC 40 *La revue du financier* vol **153** pp 45 – 62.
412. Charan R 2005 Boards that deliver: Advancing corporate governance from compliance to competitive advantage *Jossey-Bass* USA.

413. De Nooy W, Mrvar A, Batagelj V 2005 Exploratory social network analysis with Pajek *Cambridge University Press* New York USA.
414. Hanneman R A, Riddle M 2005 Introduction to social network methods *University of California Riverside* California USA
<http://faculty.ucr.edu/~hanneman/> .
415. Page F, Wooders M, Kamat S 2005 Networks and farsighted stability *Journal of Economic Theory* **120** pp 257 – 269.
416. Pueyo J 2005 Inter- firm relationships and interlocking directorates in Spanish banking in the twentieth century *Investigaciones de Historia Económica*.
417. Pueyo J 2006 Interlocking directorates in Spanish banking in the twentieth century *Dpto de Economia i Empresa Universitat Pompeu Fabra* Barcelona Spain pp 1 – 79.
418. Raheja Ch 2005 Determinants of board size and composition: A theory of corporate boards *Journal of Financial and Quantitative Analysis* **40**.
419. Rinaldi A, Vasta M 2005 The structure of Italian capitalism, 1952-1972: New evidence using the interlocking directorates technique *Financial History Review* **12** p 173.
420. Aguilera R V 2006 National state differences and patterns of directorship interlocks: A comparative study of Italy and Spain
<http://www.mit.edu/~ecastill/2006seminar/papers/Aguilera2.pdf> .
421. Barucci E 2006 Mercato dei capitali e corporate governance in Italia *Carocci editore*.
422. Batagelj V, Mrvar A 2006 Pajek *University of Ljubljana*.
423. Bertoni F, Randone P A 2006 The small-world of Italian finance: Ownership interconnections and board interlocks amongst Italian listed companies
<http://ssrn.com/abstract=917587> .
424. Bizjak J, Lemmon M, Whitby R 2006 Option backdating and board interlocks *Working Paper* Portland State University, University of Utah USA.
425. Bizjak J, Lemmon M, Whitby R 2009 Option backdating and board interlocks *Review of Financial Studies* **22** pp 4821 – 4847.
426. Carbonai D, Di Bartolomeo G November 2006, August 2007 Interlocking directorates as a thrust substitute: The case of the Italian non-life insurance industry *Department of Communication Working Paper no 1-2006, MPRA Paper no 4420* Munich University Germany
<http://mpra.ub.uni-muenchen.de/4420/> .
427. Carretta A, Farina V, Schwizer P 2006 Evaluating the board of directors of

- nancial intermediaries: Competencies, effectiveness and performance *University of Rome "Tor Vergata" Italy MPRA Paper no 8299* Munich University Germany pp 1 – 28
<http://mpra.ub.uni-muenchen.de/8299/> .
428. Farina V 2008 Banks' centrality in corporate interlock networks: Evidences in Italy Sefemeq Department University of Rome "Tor Vergata" Italy *MPRA Paper no 11698* Munich University Germany pp 1 – 31
<http://mpra.ub.uni-muenchen.de/11698/> .
429. Chhaochharia V, Grinstein Y 2006a Corporate governance and firm value: The impact of the 2002 governance rules *Journal of Finance*.
430. Chhaochharia V, Grinstein Y 2006b Executive compensation and board structure *Working Paper* Cornell University USA.
431. Chhaochharia V, Grinstein Y 2007 Corporate governance and firm value: The impact of the 2002 governance rules *Journal of Finance*
<http://faculty.fullerton.edu/jyang/Courses/fin332/Literature/governance%20rule%20result.pdf> .
432. Conyon M J, Muldoon M R 2006a The small world of corporate boards in Singapore *WSRC paper 2006 3/2* Wharton Pennsylvania USA – SMU Singapore Research Center.
433. Conyon M J, Muldoon M R 2006b The small world of corporate boards *Journal of Business Finance & Accounting* **33** (9) pp 1321 – 1343.
434. Corrado R, Zollo M 2006 Small worlds evolving: Governance reforms, privatizations, and ownership networks in Italy *Industrial and Corporate Change* vol **15** no 2 pp 319 – 352
<http://ssrn.com/abstract=915137> .
435. Elouaer S 2006 Boardroom networks among French companies: 1996 and 2005.
436. Ferrarini G A 2006 One share - one vote: A European rule? *ECGI - Law Working Paper no 58/2006*
www.ssrn.com .
437. Flores M 2006 IFIP International Federation for Information Processing *Network-Centric Collaboration and Supporting Fireworks* vol **224** pp 55 – 66 Springer Boston USA.
438. Guieu G, Meschi P X 2006 Conseils d'Administration et Reseaux d'Administrateurs en Europe (2000-2003): Dynamique et Structure *Working Paper*.
439. Jackson M O 2006 The economics of social networks Ch 1 vol **1** in *Advances in economics and econometrics theory and applications 9th World Congress of the Econometric Society* Blundell R, Newey W, Persson T (editors) *Cambridge University Press* Cambridge UK.

440. Kiel G C, Nicholson G J 2006 Multiple directorships, corporate performance in Australian listed companies *Corporate Governance* **14** pp 530 – 546.
441. Kramarz F, Thesmar D January 2006 Social networks in the boardroom *IZA Discussion Paper no 1940*
<http://ssrn.com/abstract=878678> .
442. Morresi O 2006 Performance, proprietà e turnover degli amministratori nel caso Italiano *Working Paper Italy*.
443. Murgia G 2006 L'impatto dell'interlocking sulle imprese del settore IT del Lazio: Uno studio basato sulla social network analysis *Working Paper*.
444. Prinz E 2006 Corporate governance and the uncertain role of interlocking directorates *Cahier du Fargo no 1061001* Université de Bourgogne – LEG France pp 1 – 26.
445. Silva F, Majluf N, Paredes R D 2006 Family ties, interlocking directorates, performance of business groups in emerging countries: The case of Chile *Journal of Business Research* **59** pp 315 – 321.
446. Soon Moon Kang May 23 2006 Equi-centrality and network centralization: A micro-macro linkage *Netsci Conference*.
447. Welch J, Welch S 2006 The boardroom bunker *The Welch way on Business Week*
 Business Week USA
http://www.businessweek.com/mediacenter/podcasts/welchway/welchway_12_17_06.htm .
448. Adams R B, Ferreira D 2007 A theory of friendly boards *Journal of Finance* **62** pp 217 – 250.
449. Adams R B, Hermalin B E, Weisbach M S 2010 The role of boards of directors in corporate governance: A conceptual framework and survey *Journal of Economic Literature* **48** pp 58 – 107.
450. Ciocca P 2007 Ricchi per sempre? Una storia economica d'Italia (1796-2005) *Bollati Boringhieri* Torino Italy.
451. Enriques L, Volpin M Winter 2007 Corporate governance reforms in continental Europe *Journal of Economic Perspectives* vol **21** no 1 pp 117 – 140.
452. Gerber B M 2007 Enabling interlock benefits while preventing anticompetitive harm: Toward an optimal definition of competitors under section 8 of the Clayton Act *Yale Journal on Regulation* vol **24** I p 107.
453. Ibarra H 2007 What you know or who you know? *INSEAD Knowledge-casts* INSEAD France.

- 454.** Ledenyov V O 2007a Can social networking boost businesses? *Financial Times* London UK
www.ft.com/cms/s/e5406470-860a-11dc-b00e-0000779fd2ac.html .
- 455.** Ledenyov V O 2007b Think like a leader *The Globe and Mail* Toronto Canada
<http://www.reportonbusiness.com/servlet/story/RTGAM.20071121.wmartindiscuss1128/BNStory/Business/home/?pageRequested=2> .
- 456.** Malloy Chr 2007 Social networks *Public Lecture* London School of Economics and Political Science London UK.
- 457.** Murray A S 2007 *Revolt in the boardroom: The new rules of power in corporate America* Collins USA.
- 458.** Non M, Franses P H 2007 Interlocking boards and firm performance: Evidence from a new panel database *Tinbergen Institute Discussion Paper TI 2007-034/2* The Netherlands pp 1 – 35
<http://www.tinbergen.nl> .
- 459.** Provan K G, Fish A, Sydow J 2007 Interorganizational networks at the network level: A review of the empirical literature on whole networks *Journal of Management* **33** (3) pp 479 – 516.
- 460.** Rommens A, Cuyvers L, Deloof M November 2007 Interlocking directorates and business groups: Belgian evidence *Research Paper 2007-023* Department of Accounting and Finance Faculty of Applied Economics University of Antwerp Belgium pp 1 – 42
<http://www.ua.ac.be/tew> .
- 461.** Deloof M, Vermoesen V December 2011 The value of bank relationships: Evidence from Belgium at the start of the Great Depression *Research Paper 2011-021* Department of Accounting and Finance Faculty of Applied Economics University of Antwerp Belgium pp 1 – 37
<http://www.ua.ac.be/tew> .
- 462.** Santella P, Drago C, Paone G 2007 Who cares about director independence? *Social Science Research Network USA, MPRA Paper no 2288* Munich University Munich Germany pp 1 – 74
<http://ssrn.com/abstract=971189> ,
<http://mpra.ub.uni-muenchen.de/2288/> .
- 463.** Santella P, Drago C, Polo A November 11 2007 The Italian chamber of lords sits on listed company boards: An empirical analysis of Italian listed company boards from 1998 to 2006 *MPRA Paper no 2265* Munich University Munich Germany pp 1 – 105

- <http://mpra.ub.uni-muenchen.de/2265/> ,
http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1027947 .
- 464.** Santella P, Drago C, Polo A, Gagliardi E 2009 A comparison among the director networks in the main listed companies in France, Germany, Italy, and the United Kingdom *MPRA Paper no 16397* Munich University Germany pp 1 – 19
<http://mpra.ub.uni-muenchen.de/16397/> .
- 465.** Uzzi B, Amaral L A N, Reed-Tsochas F 2007 Small-world networks and management science research: A review *European Management Review* **4** pp 77 – 91.
- 466.** Bowen W G 2008 The board book: An insider's guide for directors and trustees *W W Norton & Co* NY USA.
- 467.** Harris M, Raviv A 2008 A theory of board control and size *Review of Financial Studies* **21** pp 1797 – 1832.
- 468.** Milaković M, Alfarano S, Lux T 2008 The small core of the German corporate board network *Working Paper no 1446* Kiel Institute for the World Economy Germany.
- 469.** Milaković M, Raddant M, Birg L 2009 Persistence of a network core in the time evolution of interlocking directorates *Economics Working Paper no 2009,10* Department of Economics Christian-Albrechts-Universität Kiel Germany
<http://hdl.handle.net/10419/29539> .
- 470.** Vermeulen Fr 2008 How companies can get lucky and succeed *Public Lecture* London School of Economics and Political Science London UK.
- 471.** Alfarano S, Milaković M 2009 Network structure and N-dependence in agent-based herding models *Journal of Economic Dynamics & Control* **33** pp 78 – 92.
- 472.** Tutelman H 2008 The balance point: New ways business owners can use boards *Famille Press* USA.
- 473.** Alvarez I, Marin R, Fonfria A 2009 The role of networking in the competitiveness of firms *Technological Forecasting & Social Change* **76** pp 410 – 421.
- 474.** Cai J, Garner J L, Walkling R A 2009 Electing directors *Journal of Finance* **64** (5) pp 2387 – 2419.
- 475.** Cai J, Garner J, Walkling R 2010 Shareholder access to the boardroom: A survey of recent evidence *Journal of Applied Finance* **20** (2) pp 15 – 26.
- 476.** Rosch J T 2009 Terra incognita: Vertical and conglomerate merger and interlocking directorate law enforcement in the United States
<http://www.ftc.gov/speeches/rosch/090911roschspeechunivhongkong.pdf> .

477. Schonlau R, Singh P V 2009 Board networks and merger performance *Working Paper* Carnegie Mellon University NY USA.
478. Baccini A, Barabesi L 2010 Interlocking editorship. A network analysis of the links between economic journals *Scientometrist* **82** p 365.
479. Baccini A, Marroni L September 2013 In the shadow of the interlocking directorates regulation. A comparative case study *Research Paper no 683* Department of Economics and Statistics University of Siena Italy pp 1 – 30.
480. Stuart T E, Yim S 2010 Board interlocks and the propensity to be targeted in private equity transactions *Journal of Financial Economics* **97** pp 174 – 189.
481. Black B, Kim W 2011 The effect of board structure on firm value: A multiple identification strategies approach using Korean data *MPRA Paper no 40283* Munich University Munich Germany pp 1 – 62
<http://mpra.ub.uni-muenchen.de/40283/> .
482. Donzé P-Y 2011 The comeback of the Swiss watch industry on the world market: A business history of the Swatch Group (1983-2010) *Discussion Paper In Economics And Business 11-14* Graduate School of Economics and Osaka School of International Public Policy (OSIPP) Osaka University Toyonaka Osaka 560-0043 Japan, *MPRA Paper no 30736* Munich University Germany pp 1 – 37
<http://mpra.ub.uni-muenchen.de/30736/> .
483. Gabrielsen T S, Hjelmeng E, Sorgard L 2011 Rethinking minority share ownership and interlocking directorships: The scope for competition law intervention *European Law Review* **6** p 837.
484. Rousseau P L, Stroup C 2011 Director histories and the pattern of acquisitions *Working Paper no 11-W24* Department of Economics Vanderbilt University TN USA pp 1 – 46
www.vanderbilt.edu/econ .
485. Chu J S G 2012 Who killed the inner circle? The end of the era of the corporate interlock network
http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2061113 .
486. Ghezzi F 2012 La nuova disciplina dei legami personali in Italia *Mercato concorrenza regole* **2** p 199.
487. Gonzalez Diaz F E 2012 Minority shareholdings and interlocking directorships: The European Union approach *Antitrust Chronicle* **1**.

488. Pawlak M 2012 An interlocking-directorates monitoring system *Institute of Economics and Management* The John Paul II Catholic University of Lublin Poland DOI: 10.2478/v10241-012-0005-7 pp 1 – 34.
489. Schifeling T, Mizruchi M S August 27 - 28 2012 The decline of the American corporate network 1960-2010 Corporate Networks in the 20th century Conference University of Lausanne USA.
490. Uddin M B 2012 Inter-firm cooperation and information sharing through interlocking directorates *Management & Marketing* vol X issue 2 pp 205 – 214.
491. Anderson R, Sawyer H 2014 The board of directors as an agent of change in turnarounds *Transaction Advisors* ISSN 2329-9134
<https://www.transactionadvisors.com/insights/board-directors-agent-change-turnarounds> ,
<http://www.worldcat.org/issn/2329-9134> .
492. Whitehead Ch K December 22, 23 2014 Private communications on the boards of directors overlap in publicly traded and non-traded firms in the USA V N Karazin Kharkiv National University Kharkiv Ukraine.
493. Ferreira D January 15 2015 Corporate boards: Facts and myths *Public Lecture on 15.01.2015* Department of Finance & Financial Markets Group London School of Economics and Political Science London UK
 20150115_1830_corporateBoardsFactsMyths_sl.pdf
http://media.rawvoice.com/lse_publiclecturesandevents/richmedia.lse.ac.uk/publiclecturesandevents/20150115_1830_corporateBoardsFactsMyths.mp4 .
494. Wikipedia January 15 2015 Board of directors USA
www.wikipedia.org .
495. Blood D, Wisniewska A January 22 2015 The tribes of Davos *Financial Times* London UK
<http://blogs.ft.com/ftdata/2015/01/22/the-tribes-of-davos/> .

Strategy Science, Strategic Governance Science, Management Science:

496. Chandler A D Jr 1962, 1998 Strategy and structure: Chapters in the history of the American industrial enterprise *Beard Books* USA ISBN-10: 158798198X ISBN-13: 978-1587981982 pp 1 – 480.
497. Chandler A D Jr 1977, 1993 The visible hand: The managerial revolution in American business *Belknap Press* ISBN-10 0674940520 ISBN-13 978-0674940529 pp 1 – 624.
498. Chandler A D Jr, Daems H 1980 Managerial hierarchies: Comparative perspectives on the rise of the modern industrial enterprise *Harvard University Press* ISBN 9780674547414 .

- 499.** Chandler A D Jr 1994 Scale and scope: The dynamics of industrial capitalism *Belknap Press* USA ISBN-10: 0674789954 ISBN-13: 978-0674789951 pp 1 – 780.
- 500.** Chandler A D Jr 2001 Inventing the electronic century: The epic story of the consumer electronics and computer industries *Free Press* USA ISBN-10: 0743215672 ISBN-13: 978-0743215671 pp 1 – 336.
- 501.** Chandler A D Jr 2005 Shaping the industrial century: The remarkable story of chemical and pharmaceutical industries *Harvard University Press* Cambridge Massachusetts USA ISBN 0-674-01720-X pp 1 – 366.
- 502.** Andrews K R 1971a The concept of corporate strategy *Richard D Irwin* Homewood USA.
- 503.** Andrews K R 1971b New horizons in corporate strategy *McKinsey Quarterly* vol **7** no 3 pp 34 – 43.
- 504.** Andrews K R 1980 Directors' responsibility for corporate strategy *Harvard Business Review* vol **58** no 6 pp 30 – 42.
- 505.** Andrews K R 1981a Corporate strategy as a vital function of the board *Harvard Business Review* vol **59** no 6 pp 174 – 180.
- 506.** Andrews K R 1981b Replaying the board's role in formulating strategy *Harvard Business Review* vol **59** no 3 pp 18 – 23.
- 507.** Andrews K R 1984 Corporate strategy: The essential intangibles *McKinsey Quarterly* no 4 pp 43 – 49.
- 508.** Rumelt R P 1974 Strategy, structure and economic performance *Harvard Business School Press* Boston MA USA.
- 509.** Rumelt R P 1982 Diversification strategy and profitability *Strategic Management Journal* **3** pp 359 – 369.
- 510.** Porter M E March-April 1979 How competitive forces shape strategy *Harvard Business Review* **57** (2) pp 137 – 145.
- 511.** Porter M E 1980, 1998 Competitive strategy: Techniques for analyzing industries and competitors *Free Press* New York USA.
- 512.** Porter M E, Harrigan K R 1981 A framework for looking at endgame strategies in Strategic management and business policy Glueck B (editor) *McGraw-Hill* USA.
- 513.** Porter M E 1982a Cases in competitive strategy *Free Press* New York USA.
- 514.** Porter M E 1982b Industrial organization and the evolution of concepts for strategic planning: The new learning in Corporate strategy: The integration of corporation planning

- models and economics Taylor T H (editor) *North-Holland Publishing Company* Amsterdam The Netherlands.
515. Porter M E, Salter M S March 1982, June 1986 Note on diversification as a strategy *Harvard Business School Background Note* Harvard University pp 382 – 129.
516. Porter M E 1983 Analyzing competitors: Predicting competitor behavior and formulating offensive and defensive strategy in *Policy, strategy, and implementation* Leontiades M (editor) *Random House* USA.
517. Porter M E 1985 Defensive strategy *Strategy* **7** (1).
518. Porter M E, Millar V July 1985 How information gives you competitive advantage *Harvard Business Review*
<http://hbr.org/1985/07/how-information-gives-you-competitive-advantage/ar/1> .
519. Porter M E May 1987a The state of strategic thinking *Economist* London UK.
520. Porter M E 1987b From competitive advantage to corporate strategy *Harvard Business Review* pp 43 – 59.
521. Porter M E April 1991 America's green strategy *Scientific American* **264** (4).
522. Porter M E 1991 Toward a dynamic theory of strategy *Strategic Management Journal* **12** pp 95 – 117.
523. Montgomery C A, Porter M E (editors) 1991 Strategy: Seeking and securing competitive advantage *Harvard Business School Press* Boston Massachusetts USA.
524. Porter M E 1994a Global strategy: Winning in the World-wide marketplace in *The portable MBA in strategy* Fahey L, Randall R M (editors) *John Willey & Sons* NY USA.
525. Porter M E 1994b Competitive strategy revisited: A view from the 1990s in *The relevance of a decade: Essays to mark the first ten years of the Harvard Business School Press* Duffy P B (editor) *Harvard Business School Press* Boston Massachusetts USA.
526. Porter M E, Van der Linde C 1995 Toward a new conception of the environment-competitiveness relationship *Journal of Economic Perspectives* **9** (4) pp 97 – 118.
527. Porter M E 1996a What is strategy? *Harvard Business Review* **74** (6) pp 61 – 78.
528. Porter M E December 1996b Tradeoffs, activity systems, and the theory of competitive strategy *Unpublished Work* Harvard University USA.
529. Porter M E March February 1997 New strategies for inner-city economic development *Economic Development Quarterly* **11** (1).
530. Schwab K, Connellius P, Porter M E 1999 The global competitiveness report *Oxford University Press* New York USA.

531. Porter M E, Rivkin J W January 2000, March 2001 Competition & strategy: Course structure TN *Harvard Business School Teaching Note* Harvard University pp 700 – 091.
532. Porter M E March 2001a Strategy and the Internet *Harvard Business Review* **79** (3) <http://hbr.org/2001/03/strategy-and-the-internet/ar/1> .
533. Porter M E 2001b The technological dimension of competitive strategy in *Research on technological innovation, management and policy* vol **7** Burgelman R A, Chesbrough H (editors) *JAI Press* Greenwich CT USA.
534. Porter M E, Kramer M R 2002 The competitive advantage of corporate philanthropy *Harvard Business Review* **80** (12) pp 56 – 68.
535. Porter M E, Sakakibara M 2004 Competition in Japan *Journal of Economic Perspectives* Winter Issue.
536. Anand B N, Bradley S P, Ghemawat P, Khanna T, Montgomery C A, Porter M E, Rivkin J W, Rukstad M G, Wells J R, Yoffie D B June 2005, September 2008 Strategy: Building and sustaining competitive advantage *Harvard Business School Class Lecture* Harvard University USA pp 705 – 509.
537. Porter M E, Kramer M R December 2006 Strategy and society: The link between competitive advantage and corporate social responsibility *Harvard Business Review* **84** (12).
538. Porter M E January 2008 The five competitive forces that shape strategy *Special Issue on HBS Centennial Harvard Business Review* **86** (1) <http://hbr.org/2008/01/the-five-competitive-forces-that-shape-strategy/ar/1> .
539. Porter M December 2013 Fundamental purpose *Value Investor Insight* pp 8 – 20 www.valueinvestorinsight.com .
540. Porter M E, Heppelmann J E November 2014 How smart, connected products are transforming competition *Harvard Business Review* November USA <http://hbr.org/2014/11/how-smart-connected-products-are-transforming-competition/ar/1> .
541. Schendel D E, Hofer Ch W 1979 Strategic management. A new view of business policy and planning *Little Brown* Boston USA p 9.
542. Yelle L E 1979 The learning curve: Historical review and comprehensive survey *Decision Sciences* **10** (2) pp 302 – 328.
543. Dess G G, Davis P S 1984 Porter's (1980) generic strategies as determinants of strategic group membership and organizational performance *Academy of Management Journal* **27** (3) pp 467 – 488.
544. Schwenk C R 1984 Cognitive simplification processes in strategic decision making *Strategic Management Journal* **5** pp 111 – 128.

545. Hambrick D C 1985 Turnaround strategies in *Handbook of strategic management* Guth W D (editor) *Warren, Gorham and Lamont* New York USA pp 10-1 to 10-32.
546. Palepu K G 1985 Diversification strategy, profit performance and the entropy measure *Strategic Management Journal* **6** pp 239 – 255.
547. Barney J B 1986 Strategic factor markets: Expectations, luck, and business strategy *Management Science* **32** (10) pp 1231 – 1241.
548. Barney J B 1991 Firm resources and sustained competitive advantage *Journal of Management* **17** (1) pp 99 – 120.
549. Huff A S, Reger R K 1987 A review of strategic process research *Journal of Management* vol **13** no 2 p 211.
550. Hill C W L, Snell S A 1988 External control, corporate strategy, and firm performance in research intensive industries *Strategic Management Journal* **9** pp 577 – 590.
551. Baysinger B D, Hoskisson R E 1989 Diversification strategy and R&D intensity in large multiproduct firms *Academy of Management Journal* **32** pp 310 – 332.
552. Rue L W, Holland P G 1989 *Strategic management: Concepts and experiences* 2nd edition *McGraw-Hill* Singapore; *Sage* Beverly Hills California USA.
553. Cohen W M, Levinthal D A 1990 Absorptive capacity: A new perspective on learning and innovation *Administrative Science Quarterly* **35** pp 128 – 152.
554. Goold M 1991 Strategic control in the decentralized firm *Sloan Management Review* **32** (2) pp 69 – 81.
555. Goold M, Luchs K 1993 Why diversify? Four decades of managed thinking *Academy of Management Executive* **7** (3) pp 7 – 25.
556. Goold M et al. 1994 *Corporate level strategy: Creating value in the multi-business company* *John Willey & Sons Inc* New York USA.
557. Goold M, Campbell A September, October 1998 Desperately seeking synergy *Harvard Business Review* pp 131 – 143.
558. Alexander M, Goold M, Collis D J, Campbell A, Lieberthal K, Montgomery C A, Palepu K, Prahalad C K, Stalk G, Khanna T, Hart S L, Shulman L F, Evans Ph 1992, 1995, 1996, 1997, 1998, 1999 *Harvard Business Review on corporate strategy* *Harvard University Press* Cambridge Massachusetts USA ISBN 1-57851-699-4.
559. Yip G 1992 *Total global strategy: Managing for worldwide competitive advantage* *Prentice Hall* NY USA.
560. Yip G 1998 *Asian advantage: Key strategies for winning in the Asia-Pacific region* *Addison Wesley/Perseus Books* USA.

561. Yip G 2000 Strategies for Central and Eastern Europe *Macmillan Business* USA.
562. Yip G 2007 Managing global customers *Oxford University Press* Oxford UK.
563. Campbell A et al 1995 Corporate strategy: The quest for parenting advantage *Harvard Business Review* **73** (2) pp 120 – 132.
564. Johnson G, Scholes K 1997 Exploring corporate strategy *Prentice- Hall* London UK.
565. Johnson G, Scholes K, Whittington R 1998 Exploring corporate strategy *Simon & Shuster* UK ISBN 0-2736-8734-4.
566. Johnson G, Scholes K, Whittington R 2002, 2003 Exploring corporate strategy 7th Edition *Prentice Hall* Pearson Education Limited UK ISBN 0-2736-8734-4.
567. McKiernan P 1997 Strategy past, strategy futures *Long range planning* vol **30** no 5 p 792.
568. Child J, Faulkner D 1998 Strategies of cooperation: Managing alliances, networks and joint ventures *Oxford University Press* Oxford UK.
569. Hill C, Jones G 1998 Strategic management 1st edition *Houghton Mifflin Co* Boston USA.
570. Hill C, Jones G 2004 Cases in strategic management 1st edition *Houghton Mifflin Co* Boston USA.
571. Martin R L (1998-1999, 2005-2006) Private communications on the theory of strategy *Rotman School of Management* University of Toronto Canada.
572. Moldoveanu M, Martin R L 2001 Agency theory and the design of efficient governance mechanisms *Joint Committee on Corporate Governance Meeting* Rotman School of Management University of Toronto Ontario Canada pp 1 – 57.
573. Martin R L 2004 Strategic choice structuring: A set of good choices positions a firm for competitive advantage *Rotman School of Management* University of Toronto Canada pp 1 – 14
www.rotman.utoronto.ca strategicChoiceStructuring.pdf .
574. Martin R L 2007 Becoming an integrative thinker *Rotman Magazine* Rotman School of Management University of Toronto Ontario Canada pp 4 – 9.
575. Martin R L 2007 Designing the thinker *Rotman Magazine* Rotman School of Management University of Toronto Ontario Canada pp 4 – 8.
576. Martin R L 2008 The opposable mind *Harvard Business Press* Cambridge Massachusetts USA.
577. Martin R L 2009 The design of business *Harvard Business School Press* ISBN 1422177807 pp 1 – 256.

578. Lafley A G, Martin R L 2013 *Playing to win: How strategy really works* *Harvard Business Review Press* ISBN-10: 142218739X ISBN-13: 978-1422187395 pp 1 – 272.
579. Shiryaev A N 1999 *Essentials of stochastic finance: Facts, models, theory* *Advanced Series on Statistical Science & Applied Probability* vol **3** *World Scientific Publishing Co Pte Ltd* Kruzhilin N (translator) ISBN 981-02-3605-0 Singapore pp 383 – 395, 633 – 646.
580. Laffont J-J, Tirole J 1999 *Competition in telecommunications* *MIT Press* USA.
581. Grant R 2001 *Corporate strategy: Managing scope and strategy content* in *Handbook of strategy and management* Pettigrew A, Thomas H, Whittington R (editors) *Sage* Newbury Park California USA pp 72 – 98.
582. Welch J 2001 *Straight from the gut* *Business Plus* ISBN-10: 0446528382 pp 1 – 496.
583. Welch J 2001 *Winning* *Warner Business Books* USA.
584. Choo C, Bontis N 2002 *The strategic management of intellectual capital and organizational knowledge* 1st edition *Oxford University Press* Oxford UK.
585. Drejer A 2002 *Strategic management and core competencies* 1st edition *Quorum Books* Westport Connecticut USA.
586. Sadler P 2003 *Strategic management* 1st edition *Kogan Page* Sterling VA USA.
587. Gavetti G, Levinthal D A 2004 *The strategy field from the perspective of management science: Divergent strands and possible integration* *Management Science* vol **50** no 10 pp 1309–1318 ISSN 0025-1909 EISSN 1526-5501.
588. Gavetti G, Rivkin J W 2007 *On the origin of strategy: Action and cognition over time* *Organization Science* vol **18** no 3 pp 420 – 439 ISSN 1047-7039 EISSN 1526-5455.
589. Roney C 2004 *Strategic management methodology* 1st edition *Praeger* Westport Connecticut USA.
590. Ireland R, Hoskisson R, Hitt M 2006 *Understanding business strategy* 1st edition *Thomson Higher Education* Mason OH USA.
591. Besanko D, Shanley M, Dranove D 2007 *Economics of strategy* *John Wiley & Sons Inc* USA.
592. Hitt M, Ireland R, Hoskisson R 2007 *Management of strategy* 1st edition *Thomson/South-Western* Australia.
593. Kirkbride P S 2007 *Developing a leadership and talent architecture* *MBS Leader-casts* Melbourne Business School Melbourne Australia.
594. Murphy T, Galunic Ch 2007 *Leading in the age of talent wars* *INSEAD Leader-casts* INSEAD France.

595. Sekhar G 2007 Management information systems 1st edition *Excel Books* New Delhi India.
596. Sull D 2007a Simple rules: Strategy as simple rules Part II *Public Lecture* London School of Economics and Political Science London UK.
597. Sull D 2007b Closing the gap between strategy and execution: Strategy and its discontents *Public Lecture* London School of Economics and Political Science London UK.
598. Sull D 2007c Closing the gap between strategy and execution: Making hard choices *Public Lecture* London School of Economics and Political Science London UK.
599. Sull D 2007d Closing the gap between strategy and execution: The strategy loop in action *Public Lecture* London School of Economics and Political Science London UK.
600. Sull D 2008 An iterative approach to the strategy *Public Lecture* London School of Economics and Political Science London UK.
601. Teece D J, Winter S 2007 Dynamic capabilities: Understanding strategic change in organizations *Blackwell* Oxford UK.
602. Samuels R 2008 Japan's Grand Strategy *Public Lecture on 13.10.2008* London School of Economics and Political Science London UK
<http://www.lse.ac.uk/collections/LSEPublicLecturesAndEvents/events/2008/20080819t1316z001.htm>
http://richmedia.lse.ac.uk/publicLecturesAndEvents/20081013_1830_japansGrandStrategy.mp3
603. Chamberlain G P 2010 Understanding strategy *Create Space* Charleston SC USA.
- Disruptive Innovation in Technology, Economics and Finances:**
604. Schumpeter J A 1911; 1939, 1961 Theorie der wirtschaftlichen entwicklung; The theory of economic development: An inquiry into profits, capital, credit, interest and the business cycle Redvers Opie (translator) *OUP* New York USA.
605. Schumpeter J A 1939 Business cycle *McGraw-Hill* New York USA.
606. Schumpeter J A 1947 The creative response in economic history *Journal of Economic History* vol 7 pp 149 – 159.
607. Solow R H August 1957 Technical change and the aggregate production function *Review of Economics and Statistics* 39 pp 214 – 231.
608. Christensen C M June 16, 1977 Fatal attraction: The dangers of too much technology *Computerworld Leadership Series* pp 3 – 11.
609. Christensen C M Fall 1992a Exploring the limits of the technology S-curve, Part 1: Component Technologies *Production and Operations Management* 1 pp 334 – 357.

- 610.** Christensen C M Fall 1992b Exploring the limits of the technology S-curve, Part 2: Architectural technologies *Production and Operations Management* **1** pp 358 – 366.
- 611.** Bower J L, Christensen C M January February 1995 Disruptive technologies: Catching the wave *Harvard Business Review* **73** no 1 pp 43 – 53.
- 612.** Bower J L, Christensen C M 1997 Disruptive technologies: Catching the wave *in* Seeing differently: Insights on innovation Brown J S (editor) *Harvard Business School Press* Boston MA USA.
- 613.** Christensen C M 1997 The innovator's dilemma: When new technologies cause great firms to fail *Harvard Business School Press* Boston MA USA.
- 614.** Christensen C M, Armstrong E G Spring 1998 Disruptive technologies: A credible threat to leading programs in continuing medical education? *Journal of Continuing Education in the Health Professions* **69** no 80 pp 69 – 80.
- 615.** Christensen C M 1998 The evolution of innovation *in* Technology management handbook Dorf R (editor) *CRC Press* Boca Raton FL USA.
- 616.** Christensen C M December 1998 Disruptive technologies: Catching the wave TN *Harvard Business School Teaching Note* 699 - 125.
- 617.** Christensen C M, Cape E G December 1998 Disruptive technology a heartbeat away: Ecton, Inc *Harvard Business School Case* 699 - 018.
- 618.** Christensen C M April 1999a Value networks and the impetus to change: Managing innovation: Overview teaching note for module 1 *Harvard Business School Teaching Note* 699 - 163.
- 619.** Christensen C M April 1999b Finding new markets for new and disruptive technologies: Managing innovation, overview teaching note for module 2 *Harvard Business School Teaching Note* 699 - 164.
- 620.** Christensen C M April 1999c Teradyne: The Aurora project & Teradyne: Corporate management of disruptive change, TN *Harvard Business School Teaching Note* 399 - 087.
- 621.** Christensen C M, Dann J June 1999 Processes of strategy definition and implementation, The *Harvard Business School Background Note* 399 - 179.
- 622.** Bower J L, Christensen C M 1999 Disruptive technologies: Catching the wave Ch 29 *in* The entrepreneurial venture 2nd edition Sahlman W A, Stevenson H H, Roberts M J, Bhidé A V pp 506 – 520 *Harvard Business School Press* Boston MA USA.
- 623.** Christensen C M 1999a Innovation and the general manager *Irwin McGraw-Hill* Homewood IL USA.

624. Christensen C M 1999b Impact of disruptive technologies in telecommunications in Bringing PC economies to the telecommunications industry *PulsePoint Communications*.
625. Christensen C M, Tedlow R S January February 2000 Patterns of disruption in retailing *Harvard Business Review* **78** no 1 pp 42 – 45.
626. Christensen C M, Donovan T March 2000 Disruptive technology a heartbeat away: Ecton, Inc TN *Harvard Business School Teaching Note* 600 - 129.
627. Christensen C M, Overdorf M March April 2000 Meeting the challenge of disruptive change *Harvard Business Review* **78** no 2 pp 66 – 76.
628. Christensen C M, Bohmer R M J, Kenagy J September October 2000 Will disruptive innovations cure health care? *Harvard Business Review* **78** no 5 pp 102 – 117.
629. Christensen C M, Craig Th, Hart S March April 2001 The great disruption *Foreign Affairs* **80** no 2.
630. Christensen C M Summer 2001 Assessing your organization's innovation capabilities *Leader to Leader* no 21 pp 27 – 37.
631. Christensen C M, Milunovich S March 2002 Technology strategy: The theory and application of the Christensen model *Merrill Lynch Report Series*.
632. Bass M J, Christensen C M April 2002 The future of the microprocessor business *IEEE Spectrum* **39** no 4.
633. Anthony S D, Roth E A, Christensen C M April 2002 The policymaker's dilemma: The impact of government intervention on innovation in the telecommunications industry *Harvard Business School Working Paper* no 02 - 075.
634. Kenagy J, Christensen C M May 2002 Disruptive innovation: A new diagnosis for health care's 'Financial flu' *Healthcare Financial Management* pp 62 – 66.
635. Christensen C M, Johnson M W, Rigby D K Spring 2002 Foundations for growth: How to identify and build disruptive new businesses *MIT Sloan Management Review* **43** no 3.
636. Kenagy J W, Christensen C M 2002 Disruptive innovation - New diagnosis and treatment for the systemic maladies of healthcare *World Markets Series Business Briefing Global Healthcare 2002* pp 14 – 17.
637. Christensen C M June 2002 The rules of innovation *Technology Review*.
638. Hart S L, Christensen C M Fall 2002 The great leap: Driving innovation from the base of the global pyramid *MIT Sloan Management Review* **44** no 1 pp 51 – 56.
639. Christensen C M, Verlinden M, Westerman G November 2002 Disruption, disintegration, and the dissipation of differentiability *Industrial and Corporate Change* **11** no 5 pp 955 – 993.

640. Christensen C M 2003 The opportunity and threat of disruptive technologies *Harvard Business School Publishing Class Lecture HBSP Product Number 1482C* Boston MA USA.
641. Shah Ch D, Brennan T A, Christensen C M April 2003 Interventional radiology: Disrupting invasive medicine.
642. Christensen C M March April 2003 Beyond the innovator's dilemma *Strategy & Innovation* **1** no 1.
643. Christensen C M, Raynor M E 2003 The innovator's solution: Creating and sustaining successful growth *Harvard Business School Press* Boston MA USA.
644. Burgelman R A, Christensen C M, Wheelwright S C 2003 Strategic management of technology and innovation 4th edition *McGraw-Hill Irwin* USA.
645. Christensen C M, Anthony S D January February 2004 Cheaper, faster, easier: Disruption in the service sector *Strategy & Innovation* **2** no 1.
646. Christensen C M, Anthony S D, Roth E A 2004 Seeing what's next: Using the theories of innovation to predict industry change *Harvard Business School Press* Boston MA USA.
647. Christensen C M January 2006 The ongoing process of building a theory of disruption *Journal of Product Innovation Management* **23** pp 39 – 55.
648. Christensen C M, Baumann H, Ruggles R, Sadtler Th M December 2006 Disruptive innovation for social change *Harvard Business Review* **84** no 12.
649. Christensen C M, Horn M B, Johnson C W 2008 Disrupting class: How disruptive innovation will change the way the World learns *McGraw-Hill* USA.
650. Christensen C M, Grossman J H, Hwang J 2009 The innovator's prescription: A disruptive solution for health care *McGraw-Hill* USA.
651. Dyer J H, Gregersen H B, Christensen C M December 2009 The innovator's DNA *Harvard Business Review* **87** no 12.
652. Christensen C M, Donovan T May 2010 Disruptive IPOs? WR Hambrecht & Co *Harvard Business School Case 610-065*.
653. Dyer J H, Gregersen H B, Christensen C M 2011 The innovator's DNA: Mastering the five skills of disruptive innovators *Harvard Business Press* Boston MA USA.
654. Christensen C M, Talukdar Sh, Alton R, Horn M B Spring 2011 Picking green tech's winners and losers *Stanford Social Innovation Review* USA.
655. Christensen C M, Wang D, van Bever D October 2013 Consulting on the cusp of disruption *Harvard Business Review* **91** no 10 pp 106 – 114.
656. Bhattacharya S, Ritter J R 1983 Innovation and communication: Signaling with partial disclosure *Review of Economic Studies* **50** pp 331 – 346.

657. Scherer F M 1984 Innovation and growth: Schumpeterian perspectives *MIT Press* Cambridge MA USA.
- Information Absorption in Economics, Finances, Business Administration Sciences and Information Asymmetry in Economics, Finances, Business Administration Sciences:**
658. Akerlof G A 1970 The market for lemons: Qualitative uncertainty and the market mechanism *Quarterly Journal of Economics* **84** (3) pp 488 – 500.
659. Akerlof G A August 29 2014 Writing the "The Market for 'Lemons'": A Personal Interpretive Essay Nobelprize.org. Nobel Media AB 2014. Web. 29 Aug 2014. http://www.nobelprize.org/nobel_prizes/economic-sciences/laureates/2001/akerlof-article.html?utm_source=facebook&utm_medium=social&utm_campaign=facebook_page .
660. Leland H, Pyle D 1977 Informational asymmetries, financial structure and financial intermediation *Journal of Finance* **32** pp 371 – 387.
661. Cohen W M, Levinthal D A 1989 Innovation and learning: The two faces of R&D *Economic Journal* **99** pp 569 – 596.
662. Cohen W M, Levinthal D A 1990 Absorptive capacity: A new perspective on learning and innovation *Administrative Science Quarterly* **35** pp 128 – 152.
663. Nonaka I 1994 A dynamic theory of organizational knowledge creation *Organization Science* **5** (1) pp 14 – 37.
664. Kumar R, Nti K O 1998 Differential learning and interaction in alliance dynamics: A process and outcome discrepancy model *Organization Science* **9** pp 356 – 367.
665. Lane R J, Lubatkin M 1998 Relative absorptive capacity and inter-organizational learning *Strategic Management Journal* **19** pp 461 – 477.
666. Farina V 2008 Network embeddedness, specialization choices and performance in investment banking industry *University of Rome Tor Vergata Italy MPRA Paper no 11701* Munich University Munich Germany pp 1 – 26 <http://mpra.ub.uni-muenchen.de/11701/> .
667. Ledenyov V O, Ledenyov D O 2012a Shaping the international financial system in century of globalization *Cornell University NY USA* [www.arxiv.org 1206.2022.pdf](http://www.arxiv.org/abs/1206.2022) pp 1 – 20.
668. Ledenyov V O, Ledenyov D O 2012b Designing the new architecture of international financial system in era of great changes by globalization *Cornell University NY USA* [www.arxiv.org 1206.2778.pdf](http://www.arxiv.org/abs/1206.2778) pp 1 – 18.
669. Ledenyov D O, Ledenyov V O 2012a On the new central bank strategy toward monetary and financial instabilities management in finances: econophysical analysis of nonlinear

- dynamical financial systems *Cornell University* NY USA [www.arxiv.org 1211.1897.pdf](http://www.arxiv.org/abs/1211.1897)
pp 1 – 8.
- 670.** Ledenyov D O, Ledenyov V O 2012b On the risk management with application of econophysics analysis in central banks and financial institutions *Cornell University* NY USA [www.arxiv.org 1211.4108.pdf](http://www.arxiv.org/abs/1211.4108) pp 1 – 10.
- 671.** Ledenyov D O, Ledenyov V O 2013a On the optimal allocation of assets in investment portfolio with application of modern portfolio management and nonlinear dynamic chaos theories in investment, commercial and central banks *Cornell University* NY USA [www.arxiv.org 1301.4881.pdf](http://www.arxiv.org/abs/1301.4881) pp 1 – 34.
- 672.** Ledenyov D O, Ledenyov V O 2013b On the theory of firm in nonlinear dynamic financial and economic systems *Cornell University* NY USA [www.arxiv.org 1206.4426v2.pdf](http://www.arxiv.org/abs/1206.4426v2) pp 1 – 27.
- 673.** Ledenyov D O, Ledenyov V O 2013c On the accurate characterization of business cycles in nonlinear dynamic financial and economic systems *Cornell University* NY USA [www.arxiv.org 1304.4807.pdf](http://www.arxiv.org/abs/1304.4807) pp 1 – 26.
- 674.** Ledenyov D O, Ledenyov V O 2013d To the problem of turbulence in quantitative easing transmission channels and transactions network channels at quantitative easing policy implementation by central banks *Cornell University* NY USA [www.arxiv.org 1305.5656.pdf](http://www.arxiv.org/abs/1305.5656)
pp 1 – 40.
- 675.** Ledenyov D O, Ledenyov V O 2013e To the problem of evaluation of market risk of global equity index portfolio in global capital markets *MPRA Paper no 47708* Munich University Munich Germany pp 1 – 25
<http://mpra.ub.uni-muenchen.de/47708/> .
- 676.** Ledenyov D O, Ledenyov V O 2013f Some thoughts on accurate characterization of stock market indexes trends in conditions of nonlinear capital flows during electronic trading at stock exchanges in global capital markets *MPRA Paper no 49964* Munich University Munich Germany pp 1 – 52
<http://mpra.ub.uni-muenchen.de/49964/> .
- 677.** Ledenyov D O, Ledenyov V O 2013g On the Stratonovich - Kalman - Bucy filtering algorithm application for accurate characterization of financial time series with use of state-space model by central banks *MPRA Paper no 50235* Munich University Munich Germany pp 1 – 52
<http://mpra.ub.uni-muenchen.de/50235/> .

- 678.** Ledenyov D O, Ledenyov V O 2013h Tracking and replication of hedge fund optimal investment portfolio strategies in global capital markets in presence of nonlinearities *MPRA Paper no 51176* Munich University Munich Germany pp 1 – 92
<http://mpra.ub.uni-muenchen.de/51176/> .
- 679.** Ledenyov D O, Ledenyov V O 2013i Venture capital optimal investment portfolio strategies selection in diffusion - type financial systems in global capital markets with nonlinearities *MPRA Paper no 51903* Munich University Munich Germany pp 1 – 81
<http://mpra.ub.uni-muenchen.de/51903/> .
- 680.** Ledenyov D O, Ledenyov V O 2014a Mergers and acquisitions transactions strategies in diffusion - type financial systems in highly volatile global capital markets with nonlinearities *MPRA Paper no 53906* Munich University Munich Germany pp 1 – 142
<http://mpra.ub.uni-muenchen.de/53906/> .
- 681.** Ledenyov D O, Ledenyov V O 2014b Strategies on initial public offering of company equity at stock exchanges in imperfect highly volatile global capital markets with induced nonlinearities *MPRA Paper no 53780* Munich University Munich Germany pp 1 – 139
<http://mpra.ub.uni-muenchen.de/53780/> .
- 682.** Ledenyov D O, Ledenyov V O 2014c *MicroFX* foreign currencies ultra high frequencies trading software platform with embedded optimized Stratonovich – Kalman - Bucy filtering algorithm, particle filtering algorithm, macroeconomic analysis algorithm, market microstructure analysis algorithm, order flow analysis algorithm, comparative analysis algorithm, and artificial intelligence algorithm for near-real-time decision making / instant switching on / between optimal trading strategies *ECE James Cook University* Townsville Australia, Kharkov Ukraine.
- 683.** Ledenyov D O, Ledenyov V O 2014d *MicroLBO* software program with the embedded optimized near-real-time artificial intelligence algorithm to create winning virtuous strategies toward leveraged buyout transactions implementation and to compute direct/reverse leverage buyout transaction default probability number for selected public/private companies during private equity investment in conditions of resonant absorption of discrete information in diffusion - type financial system with induced nonlinearities *ECE James Cook University* Townsville Australia, Kharkov Ukraine.
- 684.** Ledenyov D O, Ledenyov V O 2014e On the winning virtuous strategies for ultra high frequency electronic trading in foreign currencies exchange markets *MPRA Paper no 59770* Munich University Munich Germany pp 1 – 173
<http://mpra.ub.uni-muenchen.de/59770/> .

685. Ledenyov D O, Ledenyov V O 2014f On the fundamentals of winning virtuous strategies creation toward leveraged buyout transactions implementation during private equity investment in conditions of resonant absorption of discrete information in diffusion - type financial system with induced nonlinearities *MPRA Paper no 60450* Munich University Munich Germany pp 1 – 161
<http://mpra.ub.uni-muenchen.de/60450/> .

686. Ledenyov D O, Ledenyov V O 2015 *MicroID* software program with the embedded optimized near-real-time artificial intelligence algorithm to create the winning virtuous business strategies and to predict the director's election / appointment in the boards of directors in the firms, taking to the consideration both the director's technical characteristics and the interconnecting interlocking director's network parameters in conditions of the resonant absorption of discrete information in diffusion - type financial economic system with induced nonlinearities *ECE James Cook University Townsville Australia, Kharkov Ukraine.*

Probability Theory, Statistics Theory, Spectrum Analysis Theory, Brownian Movement Theory, Diffusion Theory, Chaos Theory, Information Communication Theory in Econometrics and Econophysics:

687. Huygens 1657 *De ratiociniis in aleae ludo* (On calculations in games of chance).

688. Bernoulli J 1713 *Ars conjectandi* (The art of guessing).

689. Bernoulli D 1738, 1954 *Specimen theoriae novae de mensura sortis Commentarii Academiae Scientiarum Imperialis Petropolitanae* Petropoli vol **5** pp 175 – 192; Exposition of a new theory on the measurements of risk Sommer L (translator) *Econometrica* vol **22** pp 23 – 36.

690. De Moivre 1730 *Miscellanea analytica supplementum* (The analytic method).

691. Fourier J-B J 1807-1822, 1878, 2009 *Théorie Analytique de la Chaleur* *Firmin Didot, Cambridge University Press* ISBN 978-1-108-00178-6, ISBN 978-1-108-00180-9.

692. Fourier J-B J 1824 *Mémoires de l'Académie Royale des Sciences de l'Institut de France* **VII** pp 570 – 604

http://www.academie-sciences.fr/activite/archive/dossiers/Fourier/Fourier_pdf/Mem1827_p569_604.pdf .

693. De Laplace 1812 *Théorie analytique des probabilités* *Paris* France.

694. Bunyakovsky V Ya 1825 *Rotary motion in a resistant medium of a set of plates of constant thickness and defined contour around an axis inclined with respect to the horizon*

- Ph D Thesis no 1* under Prof. Augustin - Louis Cauchy supervision *École Polytechnique* Paris France.
- 695.** Bunyakovsky V Ya 1825 Determination of the radius-vector in elliptical motion of planets *Ph D Thesis no 2* under Prof. Augustin - Louis Cauchy supervision *École Polytechnique* Paris France.
- 696.** Bunyakovsky V Ya 1825 Heat propagation in solids *Ph D Thesis no 3* under Prof. Augustin - Louis Cauchy supervision *École Polytechnique* Paris France.
- 697.** Bunyakovsky V Ya 1846 Foundations of the mathematical theory of probability *St. Petersburg* Russian Federation.
- 698.** Connor J J, Robertson E F (July) 2000 Viktor Yakovlevich Bunyakovsky (December 16, 1804 - December 12, 1889) *School of Mathematics and Statistics* University of St Andrews Scotland UK
<http://www-history.mcs.st-andrews.ac.uk/Biographies/Bunyakovsky.html> .
- 699.** V Ya Bunyakovsky *International Conference* (August 20 - 21) 2004 Private communications with conference participants on V Ya Bunyakovsky's mathematical theory of probability and its applications in econophysics and econometrics during tour to Town of Bar Vinnytsia Region Ukraine *V Ya Bunyakovsky International Conference Institute of Mathematics of National Academy of Sciences of Ukraine (NASU) Kyiv Ukraine* www.imath.kiev.ua/~syta/bunyak .
- 700.** Chebyshev P L 1846 An experience in the elementary analysis of the probability theory *Crelle's Journal fur die Reine und Angewandte Mathematik*.
- 701.** Chebyshev P L 1867 Des valeurs moyennes *Journal de Math'ematics Pures et Appliqu'ees* vol **12** pp 177 – 184.
- 702.** Chebyshev P L 1891 Sur deux theoremes relatifs aux probabilités *Acta Mathematica* vol **14**.
- 703.** Chebyshev P L 1936 Theory of probability: Lectures given in 1879 and 1880 Lyapunov A N (lecture notes writer) Krylov A N (editor) *Moscow - St Petersburg* Russian Federation.
- 704.** Markov A A 1890 On one problem by D I Mendeleev *Zapiski Imperatorskoi Akademii Nauk SPb* **62** pp 1 – 24.
- 705.** Markov A A 1899 Application des fonctions continues au calcul des probabilités *Kazan Bulletin* **9** (2) pp 29 – 34 Russian Federation.

- 706.** Markov A A 1900, 1912, 1913 Calculation of probabilities *St Petersburg* Russian Federation; Wahrscheinlichkeits-Rechnung *Teubner* Leipzig-Berlin Germany; 3rd edition *St Petersburg* Russian Federation.
- 707.** Markov A A 1906 Extension of law of big numbers on variables, depending from each other *Izvestiya Fiziko-Matematicheskogo Obschestva pri Kazanskom Universitete* 2nd series vol **15** (94) pp 135 – 156 Russian Federation.
- 708.** Markov A A 1907, 1910 Research on fine case of depending trials *Izvestiya Akademii Nauk SPb* 6th series vol **1** (93) pp 61 – 80; Recherches sur un cas remarquable d'épreuves dependantes *Acta Mathematica* **33** pp 87 – 104 Stockholm Sweden.
- 709.** Markov A A 1908, 1912, 1971 Extension of limit theorems of calculation of probabilities to sum of variables, connected in chain *Zapiski Akademii Nauk po Fiziko-Matematicheskomu Otdeleniyu* 8th series vol **25** (3); Ausdehnung der Satze uber die Grenzwerte in der Wahrscheinlichkeitsrechnung auf eine Summe verketteter Grossen Liebmann H (translator) in *Wahrscheinlichkeitsrechnung* Markov A A (author) pp 272 – 298 *Teubner B G* Leipzig Germany; Extension of the limit theorems of probability theory to a sum of variables connected in a chain Petelin S (translator) in *Dynamic probabilities systems* Howard R A (editor) vol **1** pp 552 – 576 *John Wiley and Sons Inc* New York USA.
- 710.** Markov A A 1910 Research on common case of trials, connected in chain *Zapiski Akademii Nauk po Fiziko-Matematicheskomu Otdeleniyu* 8th series vol **25** (93) Russian Federation.
- 711.** Markov A A 1911 On one case of trials, connected in complex chain *Izvestiya Akademii Nauk SPb* 6th series vol **5** (93) pp 171 – 186 Russian Federation.
- 712.** Markov A A 1912 On trials of connected in chain unobserved events *Izvestiya Akademii Nauk SPb* 6th series vol **6** (98) pp 551 – 572 Russian Federation.
- 713.** Markov A A 1913 Example of statistical research on text of “Eugene Onegin”, illustrating interconnection of trials in chain *Izvestiya Akademii Nauk SPb* 6th series vol **7** (93) pp 153 – 162 Russian Federation.
- 714.** Fisher I 1892 Mathematical investigations in the theory of value and prices *Transactions of the Connecticut Academy* **9** pp 1 – 124.
- 715.** Einstein A 1905 On the movement of small particles suspended in a stationary liquid demanded by the molecular-kinetic theory of heat *Annalen der Physik* **17** pp 549 – 560.
- 716.** Einstein A 1956 Investigation on the theory of the Brownian motion Furth R (editor) *Dover* New York USA.

717. Einstein A, Smolukhovskiy M 1936 Brownian movement: Collection of research papers *ONTI* Moscow Russian Federation.
718. Slutsky E E 1910 Theory of marginal utility *M Sc Thesis* Vernadsky National Library Kiev Ukraine.
719. Slutsky E E 1912 Theory of correlation and elements of study about distribution curves *Kiev Commerce Institute Bulletin* **16** pp 1 – 208 Kiev Ukraine.
720. Slutsky E E 1913 On the criterion of goodness of fit of the regression lines and the best method of fitting them to the data *Journal Royal Statistics Society* vol **77** part I pp 8 – 84.
721. Slutsky E E 1914 Sir William Petty: Short overview of his economic visions with attachment of his several important research works *Kiev Commerce Institute Bulletin* **18** pp 5 – 48 Kiev Ukraine.
722. Slutsky E E 1915 Sulla teoria del bilancio del consumatore *Giornale degli economisti e rivista di statistica* **51** no 1 pp 1 – 26 Italy.
723. Slutsky E E 1922a Statistics and mathematics. Review of Kaufman *Statistics Bulletin* **3** – **4** pp 104 – 120.
724. Slutsky E E 1922b To the question of logical foundations of probability calculation *Statistics Bulletin* **9** - **12** pp 13 – 21.
725. Slutsky E E 1923a On the some patterns of correlation connection and the systematic error of correlation coefficient *Statistics Bulletin* **1** – **3** pp 31 – 50.
726. Slutsky E E 1923b On a new coefficient of mean density of population *Statistics Bulletin* **4** – **6** pp 5 – 19.
727. Slutsky E E 1923c On calculation of state revenue from emission of paper money *Local Economy* **2** pp 39 – 62 Kiev Ukraine.
728. Slutsky E E 1925a On the law of large numbers *Statistics Bulletin* **7** – **9** pp 1 – 55.
729. Slutsky E E 1925b Ueber stochastische Asymptoten und Grenzwerte *Metron* Padova Italy vol **5** no 3 pp 3 – 89.
730. Slutski E E 1926 Ein Beitrag zur Formal-praxeologischen Grundlegung der Oekonomie *Ann de la classe des sci soc-econ Akad Oukrainienne des Sciences* Kiev Ukraine vol **4** pp 3 – 12.
731. Slutsky E E 1927a The summation of random causes as sources of cyclic processes *Problems of Conjuncture (Voprosy Kon'yunktury)* vol **3** issue 1 pp 34 – 64 Moscow Russian Federation.
732. Slutski E E 1927b Zur Kritik des Bohm-Bawerkschen Wertbegriffs und seiner Lehre von der Messbarkeit des Wertes *Schmollers Jb* **51** (4) pp 37 – 52.

733. Slutsky E E 1929 Sur l'erreur quadratique mogenne du coefficient de correlation dans le cas des suites des epreuves non independantes *Comptes rendus* **189** pp 612 – 614.
734. Slutsky E E 1935 To the extrapolation problem in connection with forecast problem *Geophysics Journal* **5** (3) pp 263 – 277.
735. Slutsky E E 1937a Quelche propositione relative alla teoria delle funzioni aleatorie *Giornale dell Istituto Italiano degli Attuari* **8** no 2 pp 3 – 19.
736. Slutsky E E 1937b The summation of random causes as the source of cyclical processes *Econometrica* **5** pp 105 – 146.
737. Slutsky E E 1942, 1999 Autobiography of December 3, 1942 *Economics School* **5** pp 18 – 21.
738. Slutsky E E 1960 Selected research works (Izbrannye trudy) *Academy of Sciences of USSR* Moscow Russian Federation.
739. Bowley A L 1924 The mathematical groundwork of economic *Clarendon Press* Oxford UK.
740. Kolmogorov A N 1937 Markov chains with countable many states *Bulletin Moscow University* **1**.
741. Kolmogorov A N 1938 On analytic methods in probability theory *in* Selected works of Kolmogorov A N vol **2** Probability theory and mathematical statistics Shiryaev A N (editor) *Springer* Germany.
742. Kolmogorov A N 1947 The contribution of Russian science to the development of probability theory *Uchenye Zapiski Moskovskogo Universiteta* no 91.
743. Kolmogorov A N 1956 Probability theory in Mathematics: Its contents, methods, and meaning *Academy of Sciences USSR* vol **2**.
744. Kolmogorov A N 1956 Foundations of the theory of probability *Chelsea* New York USA.
745. Kolmogorov A N 1985 Mathematics and mechanics Selected works vol **1** *Nauka Publishing House* Moscow Russian Federation.
746. Kolmogorov A N 1986 Probability theory and mathematical statistics Selected works vol **2** *Nauka Publishing House* Moscow Russian Federation.
747. Allen R G D 1938 Mathematical analysis for economists *Macmillan* London UK.
748. Cramer H 1940 On the theory of stationary random processes *Ann Math* vol **41** pp 215 – 230.
749. Cramer H 1946 Mathematical methods of statistics *Princeton University Press* USA.
750. Cramer H, Leadbetter M 1967 Stationary and related stochastic processes. Sample function properties and their applications *John Wiley and Sons Inc* NY USA.

751. Bemshtein S N 1946 Theory of probability 4th edition *Gostehizdat* Moscow Russian Federation.
752. Neyman J, Scott E L 1948 Consistent estimates based on partially consistent observations *Econometrica* **16** pp 1 – 32.
753. Shannon C E 1948 A mathematical theory of communication *Bell System Technical Journal* **27** pp 379 – 423 and pp 623 – 656.
754. Hannan E J 1960 Time series analysis *Methuen* London.
755. Hannan E J 1970 Multiple time series *John Wiley and Sons Inc* New York USA.
756. Mandelbrot B B 1960 The Pareto-Levy law and the distribution of income *International Economic Review* no 1.
757. Mandelbrot B B 1963a The stable Paretian income distribution when the apparent exponent is near two *International Economic Review* no 4.
758. Mandelbrot B B 1963b The variation of certain speculative prices *Journal of Business* vol **36** pp 394 – 419.
759. Mandelbrot B B 1965 Une classe de processus stochastiques homothetiques a soi: Application a la loi climatologique de H. E. Hurst *Comptes Rendus de l'Academie des Sciences* vol **240** pp 3274 – 3277 Paris France.
760. Mandelbrot B B 1967a The variation of some other speculative prices *Journal of Business* vol **40** pp 393 – 413.
761. Mandelbrot B B (April) 1967b Some noises with 1/f spectrum: A bridge between direct current and white noise *IEEE Transactions on Information Theory* USA.
762. Mandelbrot B B, Taylor H M 1967 On the distribution of stock price difference *Operations Research* vol **15** no 6 pp 1057 – 1062.
763. Mandelbrot B B, van Ness J W 1968 Fractional Brownian motions, fractional noises and applications *SIAM Review* vol **10** no 4 pp 422 – 437.
764. Mandelbrot B B 1969 Robustness of the rescaled range R/S in the measurement of non-cyclic long-run statistical dependence *Water Resources Research* vol **5** no 5 pp 967 – 988.
765. Mandelbrot B B, Wallis J R 1969 Computer experiments with fractional Gaussian noises I, II, III *Water Resources Research* vol **5** pp 228 – 267.
766. Mandelbrot B B 1971 When can price be arbitrated efficiently? A limit of the validity of the random walk and martingale models *Review of Economics and Statistics* vol **53** pp 225 – 236.

767. Mandelbrot B B 1972 Statistical methodology for non-periodic cycles: From the covariance to R/S analysis *Annals of Economic and Social Measurement* vol **1** no 3 pp 259 – 290.
768. Mandelbrot B B 1975a Les objets fractals *Flammarion* Paris France.
769. Mandelbrot B B 1975b Limit theorems on the self-normalized range for weakly and strongly dependent process *Zeitschrift Wahrscheinlichkeitstheorie und Verwandte Gebiete* vol **31** pp 271 – 285.
770. Mandelbrot B B 1977 Fractals: Form, chance and dimension *W H Freeman* San Francisco USA.
771. Mandelbrot B B 1982 The fractal geometry of nature *W H Freeman* San Francisco USA.
772. Mandelbrot B B 1997 Fractals and scaling in finance *Springer* New York USA.
773. Gnedenko B V, Khinchin A Ya 1961 An elementary introduction to the theory of probability *Freeman* San Francisco USA.
774. Gnedenko B V 1988 The theory of probability *Mir* Moscow Russian Federation.
775. Shiryaev A N 1961 The problem of the most rapid detection of a disturbance in a stationary process *Soviet Mathematical Doklady* **2** pp 795 – 799.
776. Shiryaev A N 1963 On optimal methods in quickest detection problems *Theory of Probability and its Applications* **8** (1) pp 22 – 46.
777. Shiryaev A N 1964 On Markov sufficient statistics in non-additive Bayes problems of sequential analysis *Theory of Probability and its Applications* **9** (4) pp 670 – 686.
778. Shiryaev A N 1965 Some exact formulas in a 'disorder' problem *Theory of Probability and its Applications* **10** pp 348 – 354.
779. Grigelionis B I, Shiryaev A N 1966 On Stefan's problem and optimal stopping rules for Markov processes *Theory of Probability and its Applications* **11** pp 541 – 558.
780. Shiryaev A N 1967 Two problems of sequential analysis *Cybernetics* **3** pp 63 – 69.
781. Liptser R S, Shiryaev A N 1977 Statistics of random processes *Springer-Verlag* New York USA.
782. Shiryaev A N 1972 Random processes *Moscow State University Press* Russian Federation.
783. Shiryaev A N 1973, 1974 Probability, statistics, random processes *Moscow State University Press* vols **1, 2** Russian Federation.
784. Shiryaev A N 1978, 2008b Optimal stopping rules 1st edition, 3rd edition *Springer* ISSN 0172-4568 *Library of Congress Control Number: 2007934268* Berlin Germany pp 1 – 217.

785. Shiryaev A N 1988 Probability *Springer-Verlag* Berlin Heidelberg Germany.
786. Shiryaev A N 1995 Probability 2nd edition *Springer - Verlag* ISBN 0-387-94549-0 New York USA pp 1 – 621.
787. Shiryaev A N 1998a Foundations of stochastic financial mathematics vol **1** *Fazis Scientific and Publishing House* Moscow Russian Federation ISBN 5-7036-0044-8 pp 1 – 492.
788. Shiryaev A N 1998b Foundations of stochastic financial mathematics vol **2** *Fazis Scientific and Publishing House* Moscow Russian Federation ISBN 5-7036-0044-8 pp 493 – 1017.
789. Shiryaev A N 1999 Essentials of stochastic finance: Facts, models, theory *Advanced Series on Statistical Science & Applied Probability* vol **3** *World Scientific Publishing Co Pte Ltd* Kruzhilin N (translator) ISBN 981-02-3605-0 Singapore pp 1 – 834.
790. Shiryaev A N, Spokoiny V G 2000 Statistical experiments and decisions: Asymptotic theory *World Scientific Publishing Co Pte Ltd* ISBN 9810241011 Singapore pp 1 – 283.
791. Graverson S E, Peskir G, Shiryaev A N 2001 Stopping Brownian motion without anticipation as close as possible to its ultimate maximum *Theory of Probability and its Applications* **45** pp 125 – 136 MR1810977 <http://www.ams.org/mathscinetgetitem?mr=1810977> .
792. Kallsen J, Shiryaev A N 2001 Time change representation of stochastic integrals *Theory of Probability and its Applications* **46** pp 579 – 585 MR1978671 <http://www.ams.org/mathscinet-getitem?mr=1978671> .
793. Kallsen J, Shiryaev A N 2002 The cumulant process and Esscher's change of measure *Finance Stoch* **6** pp 397 – 428 MR1932378 <http://www.ams.org/mathscinetgetitem?mr=1932378> .
794. Shiryaev A N 2002 Quickest detection problems in the technical analysis of the financial data *Proceedings Mathematical Finance Bachelier Congress Paris France (2000)* *Springer* Germany pp 487 – 521 MR1960576 <http://www.ams.org/mathscinet-getitem?mr=1960576> .
795. Jacod J, Shiryaev A N 2003 Limit theorems for stochastic processes *2nd edition* *Grundlehren der Mathematischen Wissenschaften [Fundamental Principles of Mathematical Sciences]* **288** *Springer* Berlin Germany MR1943877 <http://www.ams.org/mathscinetgetitem?mr=1943877> .

- 796.** Shiryaev A N 2004 Kolmogorov and modern mathematics *International Conference at Mathematical Institute named after V A Steklov June 16-21, 2003* Russian Academy of Sciences Moscow Russian Federation ISBN 5-98419-003-6 pp 1 – 195.
- 797.** Shiryaev A N, Grossinho M R, Oliveira P E, Esquivel M L (editors) 2006 Stochastic finance *Springer* Germany ISBN-10:0-387-28262-9 pp 1 – 364.
- 798.** Peskir G, Shiryaev A N 2006 Optimal stopping and free-boundary problems *Lectures in Mathematics* ETH Zürich *Birkhäuser* Switzerland MR2256030 <http://www.ams.org/mathscinet-getitem?mr=2256030> .
- 799.** Feinberg E A, Shiryaev A N 2006 Quickest detection of drift change for Brownian motion in generalized Bayesian and mini-max settings *Statistics & Decisions* **24** (4) pp 445 – 470.
- 800.** Kabanov Yu, Lipster R, Stoyanov J 2006 The Shiryaev festschrift: From stochastic calculus to mathematical finance *Springer* Germany pp 1 – 668.
- 801.** du Toit J, Peskir G, Shiryaev A N 2007 Predicting the last zero of Brownian motion with drift *Cornell University* NY USA pp 1 – 17 <http://arxiv.org/abs/0712.3415v1>.
- 802.** Shiryaev A N 2008a Generalized Bayesian nonlinear quickest detection problems: on Markov family of sufficient statistics *Mathematical Control Theory and Finance Proceedings of the Workshop of April 10–14 2007* Lisbon Portugal Sarychev A et al (editors) *Springer* Berlin Germany pp 377 – 386.
- 803.** Eberlein E, Papapantoleon A, Shiryaev A N 2008 On the duality principle in option pricing: Semimartingale setting *Finance Stoch* **12** pp 265 – 292 <http://www.ams.org/mathscinet-getitem?mr=2390191> .
- 804.** Shiryaev A N, Novikov A A 2009 On a stochastic version of the trading rule "Buy and hold" *Statistics & Decisions* **26** (4) pp 289 – 302.
- 805.** Eberlein E, Papapantoleon A, Shiryaev A N 2009 Esscher transform and the duality principle for multidimensional semimartingales *The Annals of Applied Probability* vol **19** no 5 pp 1944 – 1971 <http://dx.doi.org/10.1214/09-AAP600> <http://arxiv.org/abs/0809.0301v5> .
- 806.** Shiryaev A N, Zryumov P Y 2009 On the linear and nonlinear generalized Bayesian disorder problem (discrete time case) optimality and risk – modern trends in mathematical finance *The Kabanov Festschrift* Delbaen F et al (editors) *Springer* Berlin Germany pp 227 – 235.
- 807.** Gapeev P V, Shiryaev A N 2010 Bayesian quickest detection problems for some diffusion processes *Cornell University* NY USA pp 1 – 25 <http://arxiv.org/abs/1010.3430v2> .

- 808.** Karatzas I, Shiryaev A N, Shkolnikov M 2011 The one-sided Tanaka equation with drift
Cornell University NY USA
<http://arxiv.org/abs/1108.4069v1> .
- 809.** Shiryaev A N, Zhitlukhin M V 2012 Optimal stopping problems for a Brownian motion with a disorder on a finite interval *Cornell University NY USA* pp 1 – 10
<http://arxiv.org/abs/1212.3709v1> .
- 810.** Zhitlukhin M V, Shiryaev A N 2012 Bayesian disorder detection problems on filtered probability spaces *Theory of Probability and Its Applications* **57** (3) pp 453 – 470.
- 811.** Feinberg E A, Mandava M, Shiryaev A N 2013 On solutions of Kolmogorov's equations for nonhomogeneous jump Markov processes *Cornell University NY USA* pp 1 – 15
<http://arxiv.org/abs/1301.6998v3> .
- 812.** Abramowitz M, Stegun I A (editors) 1964 Handbook of mathematical functions *National Bureau of Standards Applied Mathematics Series* vol **55** USA.
- 813.** Kubilius J 1964 Probabilistic methods in the theory of numbers American Mathematical Society Providence USA.
- 814.** Akhiezer N I, Glazman I M 1966 Theory of linear operators in Hilbert space *Nauka* Moscow Russian Federation.
- 815.** Lamperti J 1966 Probability *Benjamin* New York USA.
- 816.** Kai-Lai Chung 1967 Markov chains with stationary transition probabilities *Springer-Verlag* New York USA.
- 817.** Skorohod A V 1967 Random processes with independent increments *Nauka* Moscow Russian Federation.
- 818.** Gikhman I I, Skorohod A V 1968 Stochastic differential equations *Naukova Dumka* Kiev Ukraine.
- 819.** Gikhman I I, Skorohod A V 1969 Introduction to the theory of random processes 1st edition *Saunders* Philadelphia USA.
- 820.** Gikhman I I, Skorohod A V 1974-1979 Theory of stochastic processes vols **1, 2, 3** *Springer-Verlag* New York-Berlin USA-Germany.
- 821.** Breiman L 1968 Probability *Addison-Wesley* Reading MA USA.
- 822.** Feller W 1968 An introduction to probability theory and its applications vols **1, 2** 3rd edition *John Wiley and Sons Inc* New York USA.
- 823.** Brush S G 1968, 1977 A history of random processes: 1. Brownian movement *in* Study history statistics and probability Kendall M G, Plackett R L (editors) **2** pp 347 – 382 London UK.

824. Glesjer H 1969 A new test for heteroskedasticity *Journal of the American Statistical Association* **64** pp 316 – 323.
825. Ash R B 1970 Basic probability theory *John Wiley and Sons Inc* New York USA.
826. Ash R B 1972 Real analysis and probability *Academic Press* New York USA.
827. Ash R B, Gardner M F 1975 Topics in stochastic processes *Academic Press* New York USA.
828. Box G E P, Jenkins G M 1970 Time series analysis: Forecasting and control *Holden Day* San Francisco California USA.
829. Renyi A 1970 Probability theory *North-Holland Publishing Company* Amsterdam The Netherlands.
830. Isihara A 1971 Statistical physics *Academic Press* New York USA.
831. Brent R P 1973 Algorithms for minimization without derivatives *Englewood Cliffs* USA.
832. Rubin D B 1974 Estimating causal effects of treatments in randomized and nonrandomized studies *Journal of Educational Psychology* **55** (5) pp 688 – 701.
833. Borovkov A A 1976 Wahrscheinlichkeitstheorie: Eine EinjUhrung 1st edition *Birkhiuser* Basel-Stuttgart Switzerland-Germany.
834. Grangel C W J, Newbold P 1977 Forecasting economic time series *Academic Press* New York USA.
835. Grangel C W J, Teräsvirta T 1993 Modeling nonlinear economic relationships *Oxford University Press* Oxford New York UK USA.
836. Pugachev V S 1979 Theory of probability and mathematical statistics 1st edition *Nauka* Moscow Russian Federation, 2nd edition *Fizmatlit* Moscow Russian Federation ISBN 5–92210254–0 pp 1 – 496.
837. Ross S M 1980 Introduction to probability models *Academic Press* New York USA.
838. Karlin S, Taylor H M 1981 A second course in stochastic processes *Academic Press* New York USA.
839. Venttsel A D 1981 A course in the theory of stochastic processes *McGraw-Hill* New York USA.
840. Maddala G S 1983 Limited-dependent and qualitative variables in econometrics *Cambridge University Press* Cambridge UK.
841. Yaglom A M, Yaglom I M 1983 Probability and information *Reidel Dordrecht*.
842. Heckman J, Singer B 1984a A method for minimizing the impact of distributional assumptions in econometric models for duration data *Econometrica* **52** pp 271 – 320.

843. Heckman J, Singer B 1984b Econometric duration analysis *Journal of Econometrics* **24** pp 63 – 132.
844. Pagan A 1984 Econometric issues in the analysis of regressions with generated regressors *International Economic Review* **25** pp 221 – 247.
845. Van Horne J C 1984 Financial market rates and flows *Prentice Hall* Englewood Cliffs NJ USA.
846. Murphy K M, Topel R H October 1985 Estimation and inference in two-step econometric models *Journal of Business and Economic Statistics* **3** pp 370 – 379.
847. Neter J, Wasserman W, Kutner M H 1985 Applied linear statistical models 2nd edition *Irwin* Homewood USA.
848. Powell J L 1986 Censored regression quantiles *Journal of Econometrics* **32** (1) pp 143 – 155.
849. Taylor S 1986 Modeling financial time series *John Willey and Sons Inc* New York USA.
850. Tong H 1986 Nonlinear time series *Oxford University Press* Oxford UK.
851. Tornqvist L, Vartia P, Vartia Y February 1985 How should relative change be measured? *American Statistician* **39** pp 43 – 46.
852. Sharkovsky A N, Maistrenko Yu L, Romanenko E Yu 1986 Differential equations and their applications *Naukova Dumka* Kiev Ukraine pp 1 – 280.
853. Newey W, West K 1987 A simple positive semi-definite, heteroskedasticity and autocorrelation consistent covariance matrix *Econometrica* **55** pp 703 – 708.
854. Luukkonen R, Saikkonen P, Terasvirta T 1988 Testing linearity against smooth transition autoregressive models *Biometrika* **75** pp 491 – 499.
855. Judge G, Hill C, Griffiths W, Lee T, Lutkepol H 1988 An introduction to the theory and practice of econometrics 2nd edition *John Wiley and Sons Inc* New York USA.
856. Hardle W 1990 Applied nonparametric regression *Econometric Society Monograph* *Cambridge University Press* Cambridge UK.
857. Lancaster T 1990 The econometric analysis of transition data *Cambridge University Press* Cambridge UK.
858. Tong H 1990 Nonlinear time series: A dynamical system approach *Clarendon Press* Oxford UK.
859. Johansen S 1992 Cointegration in partial systems and the efficiency of single equation analysis *Journal of Econometrics* **52** pp 389 – 402.
860. Banerjee A, Dolado J J, Galbraith J W, Hendry D F 1993 Cointegration, error correction, and the econometric analysis of nonstationary data *Oxford University Press* Oxford UK.

861. Cleveland W S 1993 Visualizing data *Hobart Press Summit New Jersey USA*.
862. Pesaran M H, Potter S M (editors) 1993 Nonlinear dynamics, chaos and econometrics *John Willey and Sons Inc New York USA*.
863. Hamilton J D 1994 Time series analysis *Princeton University Press Princeton, NJ USA*.
864. Peters E E 1994 Fractal market analysis: Applying chaos theory to investment and economics *John Wiley and Sons Inc New York USA*.
865. Enders W 1995 Applied econometric time series *John Wiley and Sons Inc New York USA*.
866. Johansen S 1995 Likelihood based inference in co-integrated vector autoregressive models *Oxford University Press Oxford UK*.
867. Karatzas I, Shreve S 1995 Methods of mathematical finance *Columbia University Press New York USA*.
868. Moore G E 1995 Lithography and the future of Moore's law *Proceedings SPIE Symposium Optical Microlithography Conference VIII 2440 2*.
869. Moore G E 2003 No exponential is forever – but we can delay forever *ISSCC*.
870. Campbell J Y, Lo A W, MacKinlay A C 1996 The econometrics of financial markets *Princeton University Press Princeton USA*.
871. Mosekilde E 1996 Topics in nonlinear dynamics: Applications to physics, biology and economic systems *World Scientific Publishing Pte Ltd Singapore*.
872. Rogers L C G, Talay D (editors) 1997 Numerical methods in finance *Cambridge University Press Cambridge UK*.
873. Campbell J, Lo A, MacKinlay C 1997 The econometrics of financial markets *Princeton University Press Princeton NJ USA*.
874. Greene W H 1997, 1999, 2003 Econometric analysis 1st edition, 4th edition, 5th edition *Prentice Hall Upper Saddle River USA*.
875. Hasem P M, Pesaran B 1997 Working with Microfit 4.0: Interactive econometric analysis *Oxford University Press Oxford UK*.
876. Lo A W, MacKinlay A C 1997 The econometrics of financial markets *Princeton University Press Princeton New Jersey USA*.
877. Anderson H M, Vahid F 1998 Testing multiple equation systems for common nonlinear factors *Journal of Econometrics* **84** pp 1 – 37.
878. Hubbard B B 1998 The world according to wavelets *A K Peters Wellesley MA USA*.
879. Mallat S A 1998 Wavelet tour of signal processing *Academic Press San Diego CA USA*.
880. Teolis A 1998 Computational signal processing with wavelets *Birkhauser Switzerland*.

881. Anishenko V S, Vadivasova T E, Astakhov V V 1999 Nonlinear Dynamics of Chaotic and Stochastic Systems *Saratov University Publishing House* Saratov Russian Federation.
882. Escribano, Jorda 1999 Improved testing and specification of smooth transition regression models in Nonlinear time series analysis of economic and financial data Rothman (editor) *Kluwer Academic Press* Amsterdam The Netherlands.
883. Hasem P M, Shin Y 1999 An autoregressive distributed lag modelling approach to cointegration analysis in *Econometrics and economic theory in the 20th century: The Ranger Frisch centennial symposium* Strom S, Holly A, Diamond P (editors) *Cambridge University Press* Cambridge UK
www.econ.cam.ac.uk/faculty/pesaran/ADL.pdf .
884. Hasem P M, Shin Y, Smith R J 2001 Bounds testing approaches to the analysis of level relationships *Journal of Applied Econometrics* **16** (3) pp 289 – 326.
885. Potter S 1999 Non-linear time series modelling: An introduction *Typescript* Federal Reserve Bank of New York NY USA.
886. Rothman (editor) 1999 Nonlinear time series analysis of economic and financial data *Kluwer Academic Press* Amsterdam The Netherlands.
887. Hayashi F 2000 Econometrics *Princeton University Press* Princeton NJ USA.
888. Durbin J, Koopman S J 2000 Time series analysis of non-Gaussian observations based on state-space models from both classical and Bayesian perspectives *Journal of Royal Statistical Society Series B* **62** pp 3 – 56.
889. Durbin J, Koopman S J 2002 A simple and efficient simulation smoother for state space time series analysis *Biometrika* **89** pp 603 – 615.
890. Durbin J, Koopman S J 2012 Time series analysis by state space methods 2nd edition *Oxford University Press* Oxford UK.
891. Ilinski K 2001 Physics of finance: Gauge modelling in non-equilibrium pricing *John Wiley and Sons Inc* New York USA ISBN-10: 0471877387 pp 1 – 300.
892. Kuznetsov S P 2001 Dynamic chaos *Izdatel'stvo Fiziko-Matematicheskoi Literatury* Moscow Russian Federation pp 1 – 296.
893. Tufte E R 2001 The visual display of quantitative information 2nd edition *Graphics Press* Cheshire CT USA.
894. Nicolau J 2002 Stationary processes that look like random walks – The bounded random walk process in discrete and continuous time *Econometric Theory* **18** pp 99 – 118.
895. Koop G 2003 Bayesian econometrics *John Wiley and Sons Inc* New York USA.

896. Ledenyov V O, Ledenyov O P, Ledenyov D O 2002 A quantum random number generator on magnetic flux qubits *Proceedings of the 2nd Institute of Electrical and Electronics Engineers Conference IEEE-NANO 2002* Chicago Washington DC USA IEEE Catalog no 02TH86302002 Library of Congress number: 2002106799 ISBN: 0-7803-7538-6.
897. Woolridge J M 2002 Econometric analysis of cross section and panel data *MIT Press* Cambridge MA USA.
898. Davidson R, MacKinnon J 2004 Econometric theory and methods *Oxford University Press* Oxford UK.
899. Cameron A C, Trivedi P K 2005 Microeconometrics: Methods and applications *Cambridge University Press* Cambridge UK.
900. Protter P E 2005 Stochastic integration and differential equations *Springer* Germany.
901. Backhaus K et al 2006 Multivariate Analysemethoden. Eine anwendungsorientierte einföhrung *Springer* Berlin Heidelberg Germany.
902. Damodaran A 2006 Applied corporate finance. A user' manual 2nd edition *John Wiley & Sons Inc* New Jersey USA.
903. Ernst D, Häcker J 2007 Applied international corporate finance *Vahlen* München Germany.
904. Angrist J D, Pischke J-S 2008 Mostly harmless econometrics: An empiricist's companion *Princeton University Press* USA.
905. Vialar Th, Goergen A 2009 Complex and chaotic nonlinear dynamics *Springer-Verlag* Berlin Heidelberg Germany ISBN 978-3-540-85977-2 pp 1 – 752.
906. Weatherall J O 2013 Physics of Wall Street *Houfton* New York USA.
- Digital Signal Processing Science:**
907. Hwang K, Briggs F A 1984 Computer architecture and parallel processing *McGraw-Hill* New York USA.
908. Anceau F 1986 The architectures of microprocessors *Addison-Wesley* Wokingham England.
909. Fountain T 1987 Processor arrays, architecture and applications *Academic Press* London UK.
910. Chen C H (editor) 1988 Signal processing handbook *Marcel Dekker* New York USA.
911. Van de Goor A J 1989 Computer architecture and design *Addison-Wesley* Wokingham England.
912. Prisch P 1998 Architectures for digital signal processing *John Wiley and Sons Inc* Chichester UK.

913. Wanhammar L 1999 DSP integrated circuits *Academic Press* San Diego California USA ISBN 0-12-734530-2 pp 1 – 561.

Absorption Phenomena in Physics; Chemistry; Electrical, Electronics and Computer Engineering Sciences:

914. Neklyudov I M, Dovbnya A N, Dikiy N P, Ledenyov O P, Lyashko Yu V 2014 Research on resonant structure of absorbed chemical elements distribution in air filters at nuclear power plants by gamma activation analysis method *Proceedings of the XII High Energy Physics, Nuclear Physics, Particles Accelerators Conference* National Academy of Sciences in Ukraine (NASU), National Scientific Centre Kharkov Institute of Physics and Technology (NSC KIPT) Kharkov Ukraine March 17 – 21, 2014 p 63.

915. Ledenyov O P, Neklyudov I M 2013 Distribution of small dispersive coal dust particles and absorbed radioactive chemical elements in conditions of forced acoustic resonance in iodine air filter at nuclear power plant *Cornell University* NY USA [www.arxiv.org 1306.3324.pdf](http://www.arxiv.org/abs/1306.3324) pp 1 – 8.

916. Neklyudov I M, Dovbnya A N, Dikiy N P, Ledenyov O P, Lyashko Yu V 2013 Features of adsorbed radioactive chemical elements and their isotopes distribution in iodine air filters AU-1500 at nuclear power plants *Cornell University* NY USA [www.arxiv.org 1307.2914.pdf](http://www.arxiv.org/abs/1307.2914) pp 1 – 9.

917. Neklyudov I M, Ledenyov O P, Fedorova L I, Poltinin P Ya 2013a Generation of concentration density maxima of small dispersive coal dust particles in horizontal iodine air filter at air-dust aerosol blow *Cornell University* NY USA [www.arxiv.org 1306.2853.pdf](http://www.arxiv.org/abs/1306.2853) pp 1 – 7.

918. Neklyudov I M, Ledenyov O P, Fedorova L I, Poltinin P Ya 2013b Influence by small dispersive coal dust particles of different fractional consistence on characteristics of iodine air filter at nuclear power plant *Cornell University* NY USA [www.arxiv.org 1302.4223.pdf](http://www.arxiv.org/abs/1302.4223) pp 1 – 6.

919. Neklyudov I M, Fedorova L I, Poltinin P Ya, Ledenyov O P 2013 Features of coal dust dynamics at action of differently oriented forces in granular filtering medium *Cornell University* NY USA [www.arxiv.org 1301.5806.pdf](http://www.arxiv.org/abs/1301.5806) pp 1 – 8.

920. Ledenyov O P, Neklyudov I M, Poltinin P Ya, Fedorova L I 2012a Physical features of accumulation and distribution processes of small disperse coal dust precipitations and absorbed radioactive chemical elements in iodine air filter at nuclear power plant *Cornell University* NY USA [www.arxiv.org 1209.3151.pdf](http://www.arxiv.org/abs/1209.3151) pp 1 – 6.

- 921.** Ledenyov O P, Neklyudov I M, Poltinin P Ya, Fedorova L I 2012b Physical features of small disperse coal dust fraction transportation and structurization processes in iodine air filters of absorption type in ventilation systems at nuclear power plants *Cornell University* NY USA www.arxiv.org/1208.5198.pdf pp 1 – 9.
- 922.** Neklyudov I M, Ledenyov O P, Fedorova L I, Poltinin P Ya 2012 On the structurization of coal dust precipitations and their influence on aerodynamic resistance by granulated mediums in air filters at nuclear power plants *Cornell University* NY USA www.arxiv.org/1207.0456.pdf pp 1 – 7.
- 923.** Ledenyov O P 2012a On the structure of quantum intermediate state in type I superconductors *Cornell University* NY USA www.arxiv.org/1204.5976v1.pdf pp 1 – 5.
- 924.** Ledenyov V O, Ledenyov D O, Ledenyov O P, Tikhonovsky M A 2012 Influence by proximity effect on ultrasound attenuation in Cu-Nb composite system at low temperatures *Cornell University* NY USA www.arxiv.org/1204.3837v1.pdf pp 1 – 6.
- 925.** Ledenyov O P 2012b Geometric resonance in intermediate state of type I superconductors *Cornell University* NY USA www.arxiv.org/1207.3712.pdf pp 1 – 4.
- 926.** Ledenyov O P 2012c Oscillatory tilt effect in a metal in a weak magnetic field *Cornell University* NY USA www.arxiv.org/1208.0724.pdf pp 1 – 3.
- 927.** Ledenyov O P, Fursa V P 2012 On the parameters of intermediate state structure in high pure type I superconductors at external magnetic field *Cornell University* NY USA www.arxiv.org/1208.0723.pdf pp 1 – 5.
- 928.** Shepelev A G, Ledenyov O P, Filimonov G D 2012a New effects in absorption of ultrasound in intermediate state of high pure type I superconductor *Cornell University* NY USA www.arxiv.org/1210.1325.pdf pp 1 – 4.
- 929.** Shepelev A G, Ledenyov O P, Filimonov G D 2012b Anomalous attenuation of longitudinal ultrasound in intermediate state of high pure type I superconductor *Cornell University* NY USA www.arxiv.org/1210.1655.pdf pp 1 – 3.
- 930.** Shepelev A G, Ledenyov O P, Filimonov G D 2012c Experimental research of longitudinal ultrasound absorption in intermediate state of high pure type I superconductor *Cornell University* NY USA www.arxiv.org/1211.0114.pdf pp 1 – 8.
- 931.** Shepelev A G, Ledenyov O P, Filimonov G D 2012d Effect of anomalously high oscillations of velocity of longitudinal ultrasound in high pure type I superconductor at weak external magnetic field *Cornell University* NY USA www.arxiv.org/1211.0394.pdf pp 1 – 3.

- 932.** Shepelev A G, Ledenyov O P, Filimonov G D 2012e Influence by trajectorial electron transport on anomalous ultrasound attenuation in high pure Gallium single crystal *Cornell University* NY USA [www.arxiv.org 1211.0789.pdf](http://www.arxiv.org/abs/1211.0789) pp 1 – 4.
- 933.** Abramenkov A D, Fogel' Ya M, Slyozov V V, Tanatarov L V, Ledenyov O P 2012 Research on diffusion of Mo substrate atoms into Ti and Cr thin films by secondary ion-ion emission method *Cornell University* NY USA [www.arxiv.org 1209.4750.pdf](http://www.arxiv.org/abs/1209.4750) pp 1 – 3.
- 934.** Ledenyov D O, Mazierska J E, Allen G, Jacob M V 2012 Lumped element modeling of nonlinear properties of high temperature superconductors in a dielectric resonator *Cornell University* NY USA [www.arxiv.org 1207.5362.pdf](http://www.arxiv.org/abs/1207.5362) pp 1 – 4.
- 935.** Leong K T, Mazierska J E, Jacob M V, Ledenyov D O, Batt S 2012 Comparing unloaded Q-factor of a high-Q dielectric resonator measured using the transmission mode and reflection mode methods involving S-parameter circle fitting *Cornell University* NY USA [www.arxiv.org 1207.5622.pdf](http://www.arxiv.org/abs/1207.5622) pp 1 – 4.
- 936.** Mazierska J E, Ledenyov D O, Jacob M V, Krupka J 2012 Precise microwave characterization of MgO substrates for HTS circuits with superconducting post dielectric resonator *Cornell University* NY USA [1207.5906.pdf](http://www.arxiv.org/abs/1207.5906) pp 1 – 6.
- 937.** Jacob M V, Mazierska J E, Ledenyov D O, Krupka J 2012 Microwave characterization of CaF₂ at cryogenic temperatures using a dielectric resonator technique *Journal of the European Ceramic Society* **23** pp 2617 – 2622 2003 *Cornell University* NY USA [www.arxiv.org 1209.0110.pdf](http://www.arxiv.org/abs/1209.0110) pp 1 – 6.
- 938.** Mazierska J E, Krupka J, Jacob M V, Ledenyov D O 2012 Complex permittivity measurements at variable temperatures of low loss dielectric substrates employing split post and single post dielectric resonators *2004 IEEE MTT-S Digest* *Cornell University* NY USA [www.arxiv.org 1209.0111.pdf](http://www.arxiv.org/abs/1209.0111) pp 1 – 4.
- 939.** Jacob M V, Mazierska J E, Leong K T, Ledenyov D O, Krupka J 2012 Surface resistance measurements of HTS thin films using SLAO dielectric resonator *Cornell University* NY USA [www.arxiv.org 1209.4519.pdf](http://www.arxiv.org/abs/1209.4519) pp 1 – 4.
- 940.** Jacob M V, Mazierska J E, Krupka J, Ledenyov D O, Takeuchi S 2012 Microwave properties of Yttrium Vanadate at cryogenic temperatures *Cornell University* NY USA [www.arxiv.org 1209.5255.pdf](http://www.arxiv.org/abs/1209.5255) pp 1 – 4.
- 941.** Mazierska J E, Jacob M V, Ledenyov D O, Krupka J 2012 Loss tangent measurements of dielectric substrates from 15 K to 300 K with two resonators: Investigation into accuracy issues *Cornell University* NY USA [www.arxiv.org 1210.2230.pdf](http://www.arxiv.org/abs/1210.2230) pp 1 – 4.

- 942.** Ledenyov V O, Ledenyov D O, Ledenyov O P 2012 Features of oxygen and its vacancies diffusion in $\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$ thin films near to magnetic quantum lines *Cornell University* NY USA [www.arxiv.org 1206.5635v1.pdf](http://www.arxiv.org/abs/1206.5635v1) pp 1 – 7.
- 943.** Ledenyov D O 2013 Nonlinear surface resistance of $\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$ superconducting thin films on MgO substrates in dielectric resonator at ultra high frequencies *Cornell University* NY USA [www.arxiv.org 1303.1276.pdf](http://www.arxiv.org/abs/1303.1276) pp 1 – 10.
- 944.** Ledenyov D O, Ledenyov V O 2014 Nonlinearities in microwave superconductivity 6th edition *Cornell University* NY USA [www.arxiv.org 1206.4426v6.pdf](http://www.arxiv.org/abs/1206.4426v6) pp 1 – 919.
- 945.** Mazierska J E, Leong K T, Ledenyov D O, Rains A, Zuchowski N, Krupka J 2014 Microwave measurements of surface resistance and complex conductivity of NdBaCuO films *Advances in Science and Technology* vol **95** pp 162 – 168 *Trans Tech Publications* Switzerland doi:10.4028/www.scientific.net/AST.95.162
<http://www.ttp.net/> .