Interlocking Directorships in Polish Joint Stock Companies

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Studies concerning interlocking directorships have been carried out among Polish joint stock corporations. The main source of data have been the announcements that are to be published by corporations regularly in a journal called *Business and Court Gazette* (BCG). Interlocking directorships constitute a network among corporations the use of which enables co-ordinated management of the whole group. The phenomenon of interlocking directorships in Polish joint stock companies can be compared to the same phenomenon existing in other countries. About 13.43 percent of Polish joint stock company directors possess additional directorships. The average number of directorships for the whole group employed by Polish joint stock companies is 1,207, and 2,541 for people who hold more than one mandate. There is a positive correlation between the total investments in the Polish economy and the number of multiple directorships.

Key words: interlocking directorships, board of directors, database

The Notion of Interlocking Directorships

Generally there are two models of board organisation. The USA, Britain and Ireland companies operate a unitary board system, whereby all legal responsibilities are vested in one board headed by a chairman. In Germany, Austria, the Netherlands, Switzerland and Poland, a form of two-board management exists, with executive and supervisory board. The distinction between the two is very close to the distinction between the executive and non-executive directors in the Anglo-American model, and therefore the two models can be considered together (Mac Canna, Brennan, and O'Higgins 1998).

Many executive (inside) directors and non-executive (outside) directors hold only one directorship, however, others, particularly outside directors, hold more than one directorship. The situation in which one inside or outside director at the same time serves in two corporations is called an 'interlocking directorship' and this director is called an 'interlocking director'. Interlocking directorships are more common in groups of outside directors, as they include a number of public and political figures who are recruited from other com-

panies and especially from the banking, insurance, and investment sectors (Scott 1991).

The phenomenon of interlocking directorships can be interpreted in different ways depending on the goal of the interpretation, on the person who performs the interpretation, and when the interpretation is made.

The first interpretation of the concept of interlocking directorships comes from political science. From this point of view interlocking directorships are interpreted as 'the traces of power', 'class hegemony', and 'as vehicles in the accumulation of capital along an integrated financial-industrial axis' (Carroll and Alexander 1999). As a result of this researchers have been worried about 'the concentration of power in only few hands' (Mac Canna, Brennan, and O'Higgins 1998).

Brayshay, Cleary and Sellwood (2006) described the links between firms and individual economic actors as 'power geometry', driving forward and shaping the internationalisation of business activity. Directors are recruited from the upper-classes and form a corporate elite (inner circle) of multiple directors of similar social background (Mac Canna, Brennan, and O'Higgins 1998). Their directorships spread throughout the economy, and they form the business elite of corporate decision makers with power and influence across the business system as a whole (Scott 1991; Brickley, Linck, and Coles 1999).

The second interpretation of the concept of interlocking directorships comes from the social science. Here they are interpreted as social relations and during the study some sociological tools have been used, for example, the Social Network Analysis (SNA) technique (Mac Canna, Brennan, and O'Higgins 1998).

The third interpretation comes from management science. Here they are interpreted as an instrument of corporate control or as devices to monitor firms. For example, Barbi (2000) understands the interlocking directorship phenomenon 'as a legal instrument in order to make the control position in a firm steadier'. The multiple positions of executives create links between corporations. These links can contribute to considerable stability in the corporate governance.

The interpretation proposed by Theisen (2000) also comes from management science. He distinguishes two kinds of interlocking directorships. In his opinion interlocking directorships can, firstly, result from the accidental overlapping of business activities conducted by two people and, secondly, they can also reflect the conscious and intentional manner of establishing the links between enterprises at

the level of people involved, or be geared towards intensifying or stabilising existing links. These links can be either at the level of the owners (in this case we can speak of 'interlocking ownerships') or they can be at the level of the directors in which case we speak of 'interlocking directorships'. Theisen wrote: 'Interlocking ownerships are typical for medium sized enterprises and family enterprises. Interlocking directorships occur irrespective of company size' (Theisen 2000). From the economic point of view such a solution suffices to constitute the basis for the co-ordinated management of two or more companies.

Interlocking Directorship Studies in the Past

Interlocking directorships have been the subject of empirical studies for years.

Brayshay, Cleary and Sellwood (2006) studied the links between companies in the 1930s. In their opinion the degree of complexity of connections that created a potential indirect link between two (or three) firms, and the interlaced personal networks of contacts appeared to have increased sharply between the early 1900s and the 1930s. They examined the backgrounds and shared spaces of interactions of just one powerful member of Britain's 1930s multinational corporate elite: Patrick Ashley Cooper. Cooper was himself the connection that interlocked the London boards of ten companies of which he was a director between 1931 and 1932. Multiple directorships were common; the average number held a by member of such group was a little over six.

Burris investigated 'the political behaviour of corporations and corporate elites who occupy pivotal locations within networks formed by interlocking directorships' (Burris 1991). He studied how individuals (members of the 'inner circle') contributed to the national elections in the USA in 1972, and how corporations contributed to the national elections in 1980. The results of these studies indicate that as the number of directorships increases, political behaviour of individuals becomes more conservative. On the contrary, highly interlocked corporations seem less conservative than the average.

The studies described by Hughes, Scott, and Mackenzie concern the comparison between the number and the changes of interlocking directorships in Norway, Sweden and Scotland (Hughes, Scott, and Mackenzie 1977). They showed that the number of interlocking directorships decreased in Scotland between 1906 and 1973. They explained this fact by suggesting that 'whilst the earlier period was marked by a clustering of formally independent companies through

interlocking directorships, the later period involves the existence of a large conglomerate group of enterprises between which there is the need for only a low level of interlocking'. In Scotland in 1906, 21.6% of all directors held two or more directorships, by 1973 this figure had fallen to 10.5%.

Carroll and Alexander examined the top 250 corporations and associated networks of interlocking directorates in Canada and Australia in the 1990s (Carroll and Alexander 1999). They found that in Australia 226 directors and executives hold at least two corporate positions in the top 250, while in Canada the boards and executives of the top 250 companies had 560 such interlockers. In all, the 226 Australian interlockers carried 596 interlocks while the 560 Canadian interlockers carried 1,994 interlocks. In Australia the mean board size was 7.7 and the mean degree of interlocked boards was 3.7; in Canada the mean board size was 13.2 and the mean degree of interlocked boards was 11.3.

Scott constructed a general model of power in intercorporate networks in which there are three types of relationships: personal, capital and commercial (Scott 1991). The most important types of personal relationship are interlocking directorships and the kinship relationships among the individuals involved in various corporations. Scott studied these relations in different companies in America, Europe and Asia. Interlocking directorships are present in every economy but in his opinion there are different reasons for the creation of such networks.

Mac Canna, Brennan, and O'Higgins described the studies concerning interlocking directorships in the 250 biggest Irish companies. They also compared results with previous studies conducted by Stokamn, Zeigler, and Scott in 1985. In Ireland the percentage of multiple directorships (only 8% in the studied sample) is smaller than in other countries examined by Stokamn, Zeigler, and Scott, and, in addition to this, in Ireland there are fewer directorships held by one director (only 1.11 directorships per one director). Women held only 4.4% of the total directorships in Ireland (Mac Canna, Brennan, and O'Higgins 1998).

Barbi studied interlocking directorships in Italian companies (Barbi 2000). The data set was created from the total directory appointments in listed companies from 1983 to 1998. She considered 15,219 directory appointments concerning 232 companies and 855 directors. The information relating to each 'director' concerned the type of appointment, and the entry and exit time. Three different periods of time were studied. Barbi basically concluded that the phenomenon

of interlocking directorate in Italy was decreasing. There was also a decreasing trend in the number of links among the companies.

Theisen describes the studies concerning interlocking directorships (Personelle Verflechtungen) which have been carried out in the 100 largest German corporations and which identified 840 interlocking directorships on the board of directors level (Theisen 2000).

Interlocking directorships are also held by people who have finished their industrial activities. Brickley, Linck and Coles (Brickley, Linck, and Coles 1999) have studied what happens to CEOs after they retire. They found that, for the CEOs who leave the firm aged 64, 65 or 66, 'the average number of board seats held two years after retirement is 2.48. Nearly 88% of such CEOs hold at least one board seat, 42% hold three or more seats, and just over 28% of the retired CEOs hold four or more seats.' 'At the extreme, Allen F. Jacobson served as a director of eleven large corporations two years after having retired as CEO of Minnesota Mining and Manufacturing Company.' The average annual pay for an outside director serving on a single board is $44,000. Mr. Jacobson received approximately $595,000 for his board service. 'Many companies also provide directors with pension plans, insurance and other benefits, and perquisites'. Additionally, a chairman often receives hundreds of thousands of dollars for serving in such position (Brickley, Linck, and Coles 1999).

The research which has been recently carried out had much more sophisticated goals. For example, Fich and Shivdasani investigated 'the reputation impact of financial fraud for outside directors based on a sample of firms facing shareholder class action lawsuits' (Fich and Shivdasani 2007). The sample of sued firms contained 1,241 outside directors, 396 of which held directorships in firms other than the firm sued for fraud. They found 'a dramatic decline in the other directorships held by these outside directors'. On average, outside directors of sued firms experienced a reduction of about 50% in the number of other directorships held, and 96% of outside directors who sit on another board lost at least one directorship within three years following the lawsuit. The direct financial value of lost directorships is estimated to be approximately $1 million. The average number of other directorships held by outside directors of sued firms was as high as 0.96 in the year of the lawsuit. In the following three years the number fell to 0.47.

Harford investigated, among other things, the effect of takeover bids on the number of future board seats held by target directors (Harford 2003). In his opinion there are at least three main factors plausibly at work in the market for directors. Directors are sought

who: firstly, have experience and a reputation for maximizing shareholder value, secondly, are passive directors with a reputation for loyalty to management, and thirdly, have good personal networks – directorships are partially determined by who knows whom. Harford studied a sample of 1,091 directors from 91 *Fortune 1000* firms which were targeted from 1988 to 1991. 29% of inside directors and 58% of outside directors held other *Fortune 1000* directorships. The mean age of all directors was 59.89. The mean number of additional directorships was 1.94: 1.01 for inside directors and 2.36 for outside directors. The mean board size was as high as 11.99. Harford's studies documented that only 10% of the target outside directors were typically retained following a completed merger.

On the basis of these short studies of literature the following conclusions can be drawn:

1. Interlocking directorships have existed as a phenomenon for many years, and they have also been the subject of various studies for many years.

2. They are interpreted as the 'social relations of class hegemony', 'vehicles in the accumulation of capital', 'social network between companies' or a legal instrument which helps to control a firm. At the same timer they constitute the basis for co-ordinated management of two or more companies.

3. The subject of earlier research was the extent and the changes in interlocking directorships, while the subject of the latest research was the influence of, for example, a financial fraud or takeover bid on the number of directorships.

Database and its Development

Studies concerning interlocking directorships have been carried out among Polish joint stock corporations. The main source of data were the announcements which have to be published regularly by corporations in a journal called *Business and Court Gazette* (BCG). There are two kinds of announcements. The first is published when a company is established, the second is published when changes to the bodies of the authority occur.

The idea was to move these announcements onto a computer database. Unfortunately the BCG is only published in a paper version, which poses a major difficulty for such studies. The layout of the announcements in the BCG is predefined. All entries are divided into chapters, boxes and fields all of which allows for relatively easy access to the information sought.
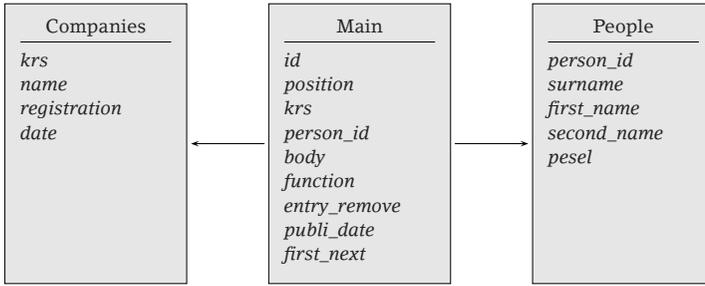
Companies	Main	People
krs	*id*	*person_id*
name	*position*	*surname*
registration	*krs*	*first_name*
date	*person_id*	*second_name*
	body	*pesel*
	function	
	entry_remove	
	publi_date	
	first_next	

FIGURE 1   The relationship in the database

The database which was developed comprises of a set of three ta-
bles. The relationships between the tables are shown in figure 1. The
first table 'Main' consists of nine fields which describe entries in the
BCG. The second table 'Persons' consists of five fields describing peo-
ple. This table contains people's personal data with a personal iden-
tification number (PESEL), and those people to whom such a number
has not been assigned. This, however, makes it impossible to use the
PESEL number to search the database and identify the people listed
in the table. People who pay their taxes in Poland have a PESEL. Gen-
erally, foreigners do not have a PESEL number, however, this is not
a strict rule. The PESEL enables to identify the age of a particular
person and their sex. Therefore, the problem was solved by each
person receiving a unique numerical identifier *(person_id)* which is
generated by the computer system. The third table is used to iden-
tify companies. This table contains the number of the National Court
Register (KRS) – the same as in the first table – and the name of the
company. The KRS number is unique for each company, which allows
for accurate identification.

Data can be entered in the database in two ways. One is the tra-
ditional way by which data are entered manually. This, however, is
time consuming and practically ineffective in view of the large num-
ber of announcements published in BCG on a daily basis. The other
is largely automated and follows the procedure below.

1. The relevant excerpts from the paper edition of BCG (the only
one available) are scanned and stored as PDF files.

2. PDF files are converted into text formats with the application of
Text Processing Software (Fine Reader software has been used).

3. The relevant fragments of the text files are then pasted into the
appropriate fields of the MySQL database by using PHP scripts.

PHP (Hypertext Pre-processor) does not have many complex functions in the conversion of character strings but those which are available enable the application of this language in the situation in question.

The key element of the process is the conversion of PDF files into text files because there are errors that are difficult to eliminate. There are two kinds of errors:

1. Errors which appear in BCG announcements and are made by Journal editors.

2. Errors made while transferring the text from PDF format to TXT format. These errors result from inaccurate printing of the text. Inaccurate printing causes Fine Reader to make mistakes during text recognition. Errors can be made in particular during the recognition of names, surnames, company names and foreign languages.

Every day there are several pages of announcements in the BCG concerning joint stock companies. By combining several pages of announcements published in one month, it is possible to create a text file which is subsequently analysed prior to registration in the database. A text file which contains announcements from one month usually comprises more than 250 pages.

As of 15 April 2008, all changes in the composition of Management Boards and Boards of Directors in Polish joint stock companies made during the period from March 2001 to November 2007 were recorded in the database, i. e. 153,886 announcements. The same number of entries is therefore made in the first *(main)* table. These announcements referred to 69,393 people (this is the number of entries in the second table) and 7,451 companies (i. e. the number of entries in the third table). At present, the database is regularly updated to include the data from the past few months. Assuming that the database contains data from at least five years, a full picture of the composition of Management Boards and Boards of Directors for all Polish joint stock companies can be obtained. It is worth bearing in mind that the term of office for the Board of Directors and Management Board members must not exceed five years.

Interlocking Directorships

On the basis of the data collected in the database so far, it is possible to make some conclusions concerning interlocking directorships. It must be stressed that in Poland there is no legal restriction regarding

Number of companies

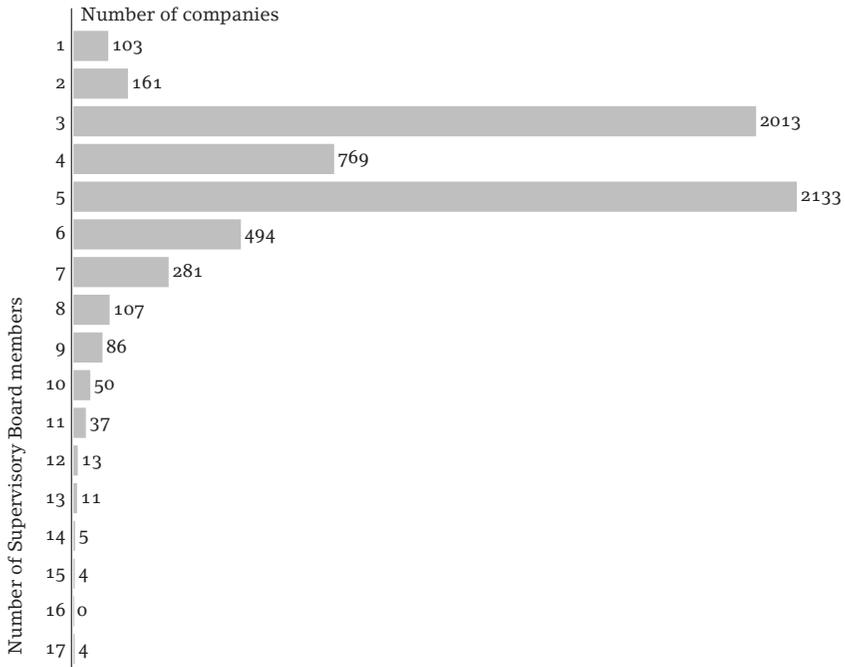| Number of Supervisory Board members	
1	103
2	161
3	2013
4	769
5	2133
6	494
7	281
8	107
9	86
10	50
11	37
12	13
13	11
14	5
15	4
16	0
17	4

FIGURE 2   The number of supervisory board members

the number of interlocking directorships. The situation is the same as in Italy (Bianchi, Bianco, and Enriques 2001).

MEMBERSHIP NUMBERS IN THE BODIES OF AUTHORITY

On the basis of the data collected, we can work out the average number of members in particular bodies of authority. The board of directors of Polish joint stock companies on average consists of 6.59 members (2.14 inside directors and 4.45 outside directors). 13% of board members are foreigners (people who do not possess a PESEL number). About 26.6% of the boards' members are women. The average age of an inside director is 44.26 whereas that of an outside director is 44.84.

Some details are presented in figure 2. As we can see, the supervisory board (the members of which are outside directors) usually consists of three or five members. Generally, a situation in which the supervisory board consists of four members is avoided. This is probably due to the fact that companies want to facilitate voting and avoid the situation of a tied vote. We can see from figure 2 that some supervisory boards consist of fewer than three members as required

Number of persons

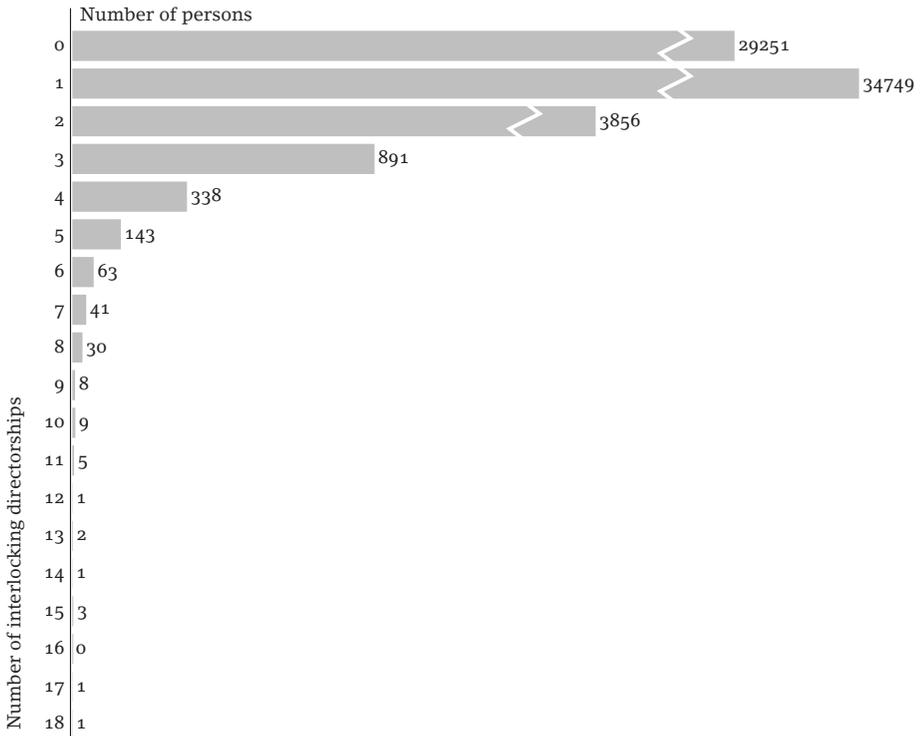| Number of interlocking directorships	Number of persons
0	29251
1	34749
2	3856
3	891
4	338
5	143
6	63
7	41
8	30
9	8
10	9
11	5
12	1
13	2
14	1
15	3
16	0
17	1
18	1

FIGURE 3   The number of directorships held in Polish joint stock companies

by law. This may result from the fact that some board members may have lost their mandates and no one has yet been appointed to these positions. Possibly some were appointed before March 2001, still hold their positions and so they were not taken into consideration in the database.

The number of directorships held in Polish joint stock companies is presented in figure 3. The total number of people in the database is 69,393. Some of them (29,251) currently do not have any directorships. 34,749 people serve only in one company, 3,856 serve in two companies, and so on. 13.43% people possess more than one directorship. The numbers presented in figure 3 concern the functions in the supervisory boards and also in the management boards. As we can see, there are people who have as many as 17 or even 18 directorships.

The average number of multiple directorships for the whole group is 2.541. For the foreigners (people who do not possess a PESEL num-
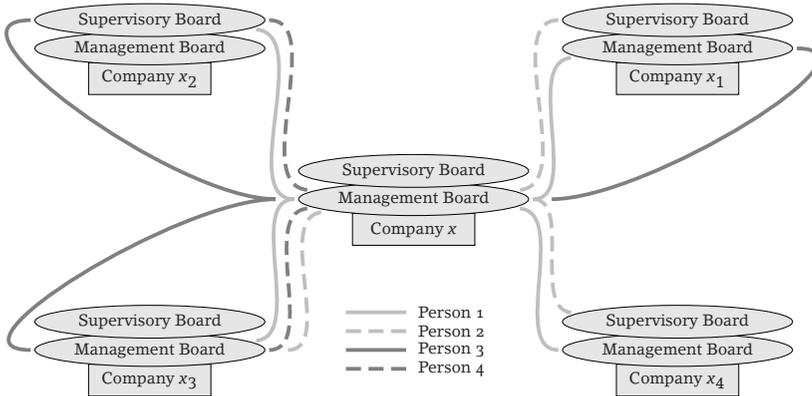
FIGURE 4   Management board of a company and interlocking directorships

ber) this number is somewhat higher – 2.563 – and for people who possess a PESEL number it is somewhat lower – 2.540.

CONNECTIONS BETWEEN CORPORATIONS

Interlocking directorships constitute a network between corporations which enables the co-ordinated management of the whole group. An example of such a situation is shown in figure 4. The management board of the company x consists of 8 people. Four of them serve in other companies on the supervisory boards and also on management boards. In figure 4 only four companies are shown which are connected with the company through its management board. These interlocking directorships facilitate the co-ordinated management of the whole group of five companies. In the company there are subsidiaries that are also managed thanks to interlocking directorships. For example, one the members of the company's management board, also serves on the board of directors of the company's eleven subsidiaries.

CHANGES IN INTERLOCKING DIRECTORSHIPS

In the analysed period from 2001 to 2007, the number of interlocking directorships has changed. This is shown in figure 5. When calculating these numbers people who were holding more than one directorship were taken into consideration. We omitted the year 2001 because this was the year when companies started publishing announcements and therefore this year is not comparable. It is clear that from the year 2002 until 2004 the number of multiple directorships decreased. After that, from the years 2004 to 2007 the number
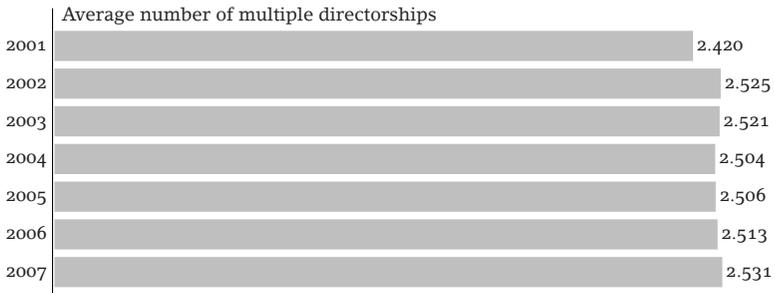
Average number of multiple directorships

Year	Value
2001	2.420
2002	2.525
2003	2.521
2004	2.504
2005	2.506
2006	2.513
2007	2.531

FIGURE 5   Average number of multiple directorships in subsequent years

Growth rate of real GDP per inhabitant (in %)

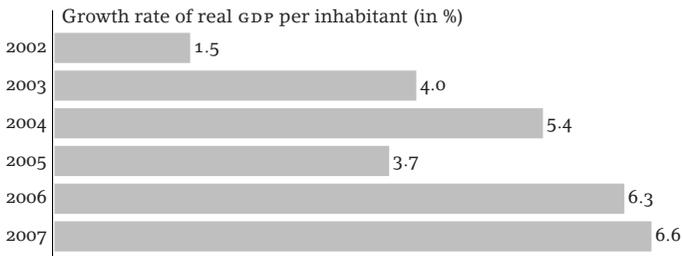| Year	Value
2002	1.5
2003	4.0
2004	5.4
2005	3.7
2006	6.3
2007	6.6

FIGURE 6   Growth rate of real GDP per inhabitant (in %)

of interlocking directorships again increased. The tendency might be correlated with some general economic indexes like the Gross Domestic Product (GDP), and, in our opinion, this issue requires a future study.

THE CORRELATION BETWEEN THE NUMBER OF
INTERLOCKING DIRECTORSHIPS AND THE ECONOMIC
DEVELOPMENT DATA

In figures 6 and 7 two indicators are shown which characterise the Polish economy: the growth rate of real GDP per inhabitant (%) and the total investment as a % of GDP.

The year 2001 has been omitted because data concerning interlocking directorships are not comparable for this year (in 2001 companies only started publishing their announcements).

First we study the correlation between the total investment (the independent variable) and the number of interlocking directorships (the dependent variable). In figure 7 the regression line $y = 0.006x + 2.389$ is shown, and also the coefficient of determination $R^2 = 0.635$. Thus, the correlation coefficient $R = 0.7969$.
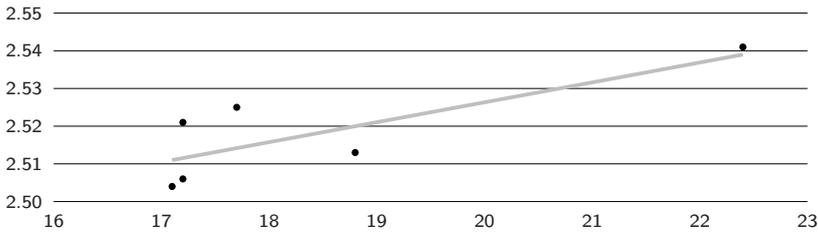
FIGURE 7   Total investment as % of GDP

FIGURE 8   The regression between total investment and number of directorships
($y = 0.006x + 2.389$, $R^2 = 0.635$)

For this example we can also compute the Spearman rank-correlation coefficient. The computation results are presented in table 1.

$$\text{Spearman's } R = 1 - \frac{6\sum d_i^2}{n(n^2 - 1)} = 1 - \frac{6(6)}{6(36 - 1)} = \frac{5}{6}.$$

We can now test the null hypothesis:

H$_0$ *Total investments and number of directorships are not positively correlated;*

against the alternative:

H$_1$ *Total investments and the number of directorships are positively correlated.*

The null hypothesis can be tested at a desired level of significance, say 5 percent, and a rejection of H$_0$ implies the existence of a positive correlation. The test is clearly a once-off test. It is performed by computing:

$$x = \frac{n(n^2 - 1) - 6(\sum d_i^2 - 1)}{n(n + 1)\sqrt{n - 1}}.$$

TABLE 1 Computation of $\sum d_i^2$ for Spearman tests – total investments and the number of directorships

Total investments (1)	Number of directorships (2)	Rank of investments (3)	Rank of directorships (4)	Difference (3)−(4)	Difference^2 (5)^2
18,7	2,525	4	5	−1	1
18,2	2,521	3	4	−1	1
18,1	2,504	1	1	0	0
18,2	2,506	2	2	0	0
19,7	2,513	5	3	2	4
22,3	2,541	6	6	0	0
					$\sum d_i^2 = 6$

TABLE 2 Computation of $\sum d_i^2$ for Spearman tests – growth rate of real GDP and number of directorships

Growth rate of real GDP (1)	Number of directorships (2)	Rank of real GDP (3)	Rank of directorships (4)	Difference (3)−(4)	Difference^2 (5)^2
1.5	2,525	1	5	−4	16
4	2,521	3	4	−1	1
5.4	2,504	4	1	3	9
3.7	2,506	2	2	0	0
6.3	2,513	5	3	2	4
6.6	2,541	6	6	0	0
					$\sum d_i^2 = 30$

Any value of x above 1.645 leads to the rejection of H$_0$ and to the existence of a positive correlation. In our example:

$$X = \frac{6(6^2 - 1) - 6(6 - 1)}{6(6 + 1)\sqrt{6 - 1}} \approx 1.917, \quad 1.917 > 1.645,$$

therefore we can reject the H$_0$ hypothesis and accept the H$_1$ hypothesis. There is a positive correlation between the total investments and the number of multiple directorships.

In the same way we can test the correlation between the growth rate of real GDP per inhabitant and the number of multiple directorships. The calculations are presented in table 2.

We cannot reject the H$_0$ hypothesis. There is no correlation between the growth rate of real GDP per inhabitant and the number of multiple directorships.

Conclusions

The phenomenon of interlocking directorships in Polish joint stock companies is comparable with the same phenomenon existing in other countries.

1. The average size of the board of directors in Polish companies is about 6.59. In the big companies studied by Harford (2003) this number is 11.99.

2. The average age of board members in Polish joint stock companies is about 44.26 for inside directors, and 44.84 for outside directors. It is a relatively young group. For example, in a sample of 1,091 directors from 91 *Fortune 1000* firms studied by Harford the mean age of all directors is 59.89 (Harford 2003).

3. About 26.6% of the board members of Polish joint stock companies are women. This concerns only those who have a PESEL. It is quite a big share. In comparison, in Ireland women held only 4.4% of the total directorships (Mac Canna, Brennan, and O'Higgins 1998).

4. About 13.43% directors of Polish joint stock companies hold additional directorships. In the sample studied by Harford (2003) 29% of inside directors and 58% of outside directors held other directorships, however, Harford only studied big companies that are listed in *Fortune 1000*. In Scotland in 1973 10.5% of all directors held two or more directorships (Hughes, Scott, and Mackenzie 1977). The number of multiple directors in Poland is comparable to the number of multiple directors in other European countries studied by Stokman and Wasseur (Mac Canna, Brennan, and O'Higgins 1998).

5. The average number of directorships for the whole group serving in Polish joint stock companies is 1.207, and 2.541 for people who hold more than one mandate. In the sample studied by Harford (2003), the mean number of additional directorships was 1.94 (inside directors 1.01, outside directors 2.36).

6. There is a positive correlation between total investments in % of GDP and multiple directorships number in Polish join stock corporations.

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