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Investor protection and disclosure. Quantitative evidence

Marek Gruszczyński  
Warsaw School of Economics

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# Investor protection and disclosure. Quantitative evidence

**Marek Gruszczyński**

Warsaw School of Economics

marek.gruszczyński@sgh.waw.pl

## Abstract

The paper surveys research in the area of measuring the level of accounting disclosure and of exploring various issues associated with accounting disclosure. In particular, the question of how the disclosure is connected to investor protection is investigated. This issue is shown in the context of the countries' legal systems and in the relation to corporate governance.

New results presented in the paper include composition and application of Polish Corporate Disclosure Index (*PCDI*). *PCDI* has been evaluated for 48 companies listed on Warsaw Stock Exchange for the years 2005, 2006 and 2007. Subsequently *PCDI* was used as the regressor variable in a number of models explaining various investor protection measures. The outcome of this research is that *PCDI* is significantly associated with the variables representing investor protection. Higher values of *PCDI* are linked with the lower variability of stock prices, with the better the category of auditor as well as with the better management and the better perception of the company by the market.

Keywords: accounting disclosure, corporate disclosure, investor protection, accounting research.

JEL codes: C10, G30, M41

## **Investor protection and disclosure. Quantitative evidence**

### **1. Investor protection**

This paper focuses on the research in the area of measuring the level of accounting disclosure and of exploring various issues associated with accounting disclosure. One obvious question is how the disclosure is connected to investor protection.

The term investor protection encompasses all activities aimed at observing, guarding and enforcing the rights and claims of investors. This includes the accessibility of legal counsel and the legal proceedings for investors. Accordingly, the specific meaning of investor protection in a country in question depends on the extent of the local laws that protect the rights of investors as well as on the strength of institutions implementing these laws. The matter of investor protection is decisive for the quality of corporate governance in companies operating in a country. Healthy system requires equal treatment and equal supply of information to all groups of investors. Individual investors in companies are essentially weaker and less informed than institutional investors like banks etc. For example, banks providing various financial products to companies are potentially superior over other investors in terms of information, professional expertise and experience.

The paper is organized as follows. Sections 2 and 3 show the investor protection and disclosure issues in the context of the countries' legal systems and in the relation to corporate governance. Section 4 discusses problems of measuring the disclosure level. Sections 5 and 6 present a brief survey of the research attempts related to the relationship between disclosure and investor protection. New Polish Corporate Disclosure Index (*PCDI*) is presented in Section 7 along with the results of quantifying the association between *PCDI* and various investor protection variables for a sample of Polish listed companies. Section 8 concludes.

### **2. Investor protection and the legal system**

Major research in the area of investor protection has been concentrated on showing the association between investor protection level and the type and efficiency of law in various countries. The evidence reveals that there is significant distinction between *civil law* countries and the *common law* countries.

In civil law (*code law*) countries the legal system is founded on codes (dated back to Roman Empire). The judgments are based only on these codes or on its previous interpretation. This system is representative for countries of continental Europe, like France, Germany, and Spain. On the other hand, the common law countries have legal systems based on past judicial opinions, laws are acquired over time and may be changed by single rulings. Major common law countries are United Kingdom, United States, Canada, Australia and New Zealand.

LaPorta, Lopez-de-Silanes, Shleifer and Vishny (1998, 1999, 1999a) in their comprehensive cross-country research have shown that the countries with stronger investor protection are countries of common law origin. The civil law countries have generally weaker investor protection. This weaker protection results in less developed financial markets and in less timely and transparent accounting. The system in civil law countries exposes less demand for accounting and auditing as mechanisms of introducing changes necessary for better investor protection.

Using a simple theoretical structure Shleifer and Wolfenzon (2000) proved that countries with better legal protection of outside investors – compared to countries with less protection – have:

- higher capitalization of stock markets,
- more companies listed on the exchanges,
- larger listed companies (in terms of sales and/or assets),
- higher valuation of listed firms in relation to their assets,
- higher dividend payouts,
- smaller concentration of ownership and control,
- lower private benefits of control,
- higher correlation between investment opportunities and actual investments.

In the introduction to the book *Investor protection and corporate governance; firm-level evidence across Latin America* (2007) A. Shlaifer indicates that investor protection is weaker on undervalued and less developed markets than on the mature markets. The issues of investor protection vary across markets. The significant issue in Latin America is the problem of hidden expropriation of investors. It is signalled by: ownership concentration, low dividend payouts, large discrepancy between cash flow ownership by dominated shareholders and their share of votes in general assembly. Shaifer believes that the solution of these problems lies in enforcing of legal mechanisms (such as corporate law, bankruptcy law, securities law) includ-

ing implementation of the rules addressing the problem of self-dealing by corporate insiders as well as the rules on disclosure of information.

### **3. Accounting disclosure, corporate governance and investor protection**

One of major aims of accounting disclosure is to inform present and prospective investors of accounting strategies and the methods used for preparing and presenting periodic corporate financial statements. Accounting disclosure makes up the crucial element of corporate transparency which is the accessibility of firm-specific information to the public, specifically to parties from the outside of publicly traded firms.

Numerous studies on disclosure and consequences of disclosure can be found in a number of journals like *International Journal of Disclosure and Governance* published by Palgrave Macmillan or *Corporate Governance: Disclosure, Internal Control & Risk Management* published in the base of Social Studies Research Network.

From the point of view of economics transparent financial disclosure minimizes agency problems (between owners and managers) by reducing the asymmetry of information between management and shareholders. Conversely, poor financial disclosure may deceive shareholders leading to unfavourable effects on company valuation and, consequently, on the value of shareholders wealth. Healy and Palepu (2001) argue that transparency may enhance the welfare by improving the efficiency of capital allocation in the economy.

Beekes, Brown and Chin (2007) show that companies with better corporate governance deliver more disclosure to the market. In their study the quantity of disclosed information is explained in a model including the governance level as explanatory variable.

What is the connection between investor protection and the level of disclosure? Logically it seems to be simple: the more disclosure the better protection of investors. On the other hand, disclosure may be unfavourable for the company, including the investors. Francis, Khurana and Pereira (2001) indicate the following information order: (1) investor protection laws → (2) financial markets development → (3) role of accounting and auditing in corporate governance → (4) observed properties of country-specific financial statements. Thus, financial statements may reflect the needs of investor protection but it is not clear that it is always the case.

Accordingly, it is always worth to find out if the financial disclosure is adequate for investor protection or perhaps it is insufficient or excessive. If such findings are to be expressed quantitatively they shall be based on some reasonable measure of disclosure level.

#### 4. Measuring the level of disclosure

The issue of measuring the quantity and quality of disclosure is being studied in the literature from some time. Major ideas in this respect amount to creating the disclosure index founded on the details of accounting laws in a specific country, like the *Polish Corporate Disclosure Index (PCDI)* presented below in Section 7. The name of Polish index uses the name idea of *Brazilian Corporate Disclosure Index (BCDI)*; see: Lopes and de Alencar (2008). Brazilian index measures disclosure in 6 areas:

- (i) general information about the firm its market and major events over the last year,
- (ii) relations to employees and managers regarding compensation and policies,
- (iii) non-financial information about markets, sales and products,
- (iv) information about forecasts of sales, cash flows and earnings,
- (v) discussion and analysis of financial data including time series information about performance and explanations of past behavior,
- (vi) other information.

The score is measured over 47 questions with binary answers being 1 for answers considered to be good disclosure and 0 otherwise. Data is composed by the panel of 50 shares with highest liquidity on São Paulo Stock Exchange (BOVESPA) on December 2005.

Another disclosure “index”, proposed by Beuselinck, Deloof and Manigart (2008) is much simpler than *BCDI*. The disclosures are represented by dummy variable equal to 1 if the company discloses the entire financial report while it is admissible to disclose only the abridged version of the report (0 otherwise). Other disclosure indices can be created directly from financial reports like the one proposed by Grüning (2009) who constructed the measure on the basis of computer screening of the reports and other materials published by the companies.

There are also international disclosure indices, like CIFAR (see CIFAR 1995) which aim at describing disclosure as prescribed by the laws of a given country. E.g. CIFAR checks how many from 90 selected items are to be included in companies’ annual reports, according to the law. Obviously, such indices describe the “disclosure climate” of a country, may be utilized in cross-country comparisons but are useless on micro level.

On the other hand, disclosure ratings of US companies in *AIMR database* (AIMR = Association for Investment Management and Research) are available on the micro level. The AIMR ratings are constructed by the analysts on the basis of data collected from three disclosure areas: a) level of optional disclosure in formal annual report, b) level of optional disclo-

sure in quarterly reports and other company reports, c) level of informal contacts with analysts. The AIMR rating is used in the accounting studies as the variable representing the level of non-compulsory (optional) disclosure (see: Luo i Plumlee 2008). Another example of this kind is the Standard & Poor's Transparency and Disclosure Rating (see: Patel i Dallas 2002).

Disclosure ratings of companies are becoming important element of information about the quality of corporate governance, especially in the USA. The commercial companies creating such ratings are e.g.: GovernanceMetrics International, Audit Integrity, RiskMetrics (before: Institutional Shareholder Services), The Corporate Library and other. Disclosure ratings assigned to companies are sometimes the object of critique. Daines, Gow and Larcker (2008) have shown that corporate governance ratings for 2005 produced by Audit Integrity, RiskMetrics, GovernanceMetrics International, and The Corporate Library are below the level declared by these companies. Such firms (known as proxy advisory firms) provide voting recommendations to shareholders on general assembly meetings. Corporate governance rating firms provide indices to evaluate the effectiveness of a firm's governance and claim to be able to predict future performance, risk, and undesirable outcomes such as accounting restatements and shareholder litigation. It turns out that the recommendations are not adequately founded in companies' predictions. Daines, Gow and Larcker (2008) examined some 15 thousand ratings for about 7 thousand companies in 2005-2007. Most of the ratings did not show significant correlation with the following outcomes: accounting restatements (should signify weak governance), class action lawsuits (also "bad" outcome), future operating performance (measured by ROA), company value (measured by Tobin's Q) and future stock returns (measured by excess stock returns, *alpha*).

In this context it might be relevant to mention the non-commercial ratings of corporate governance for Polish listed companies generated by Polish Institute of Directors and Polish Corporate Governance Forum (Gruszczyński 2008).

## **5. What are the research areas in the context of disclosure?**

Accounting disclosure is the evident subject of scientific research in accounting and in corporate finance. It is especially important nowadays when the financial crises teach all of us (governments, investors, clients alike) to demand greater corporate transparency. It is hard to understand how in the internet era one can try to "hide" some information. The company owners believe that companies disclose a lot of information duly produced to satisfy requirements of the accounting law and other regulations. On the other hand, regulating bodies shall take care of public interest, including the interest of investors and therefore there is always a

room for new requests of disclosure. So, we have a kind of game between various players on the capital markets and the market supervisors. It is not clear how substantial is the “optimal” disclosure on specific market and during particular period of time. The observed outcome of this game is just one of the possible solutions, probably not optimal to anyone.

Researchers usually concentrate on single research questions and explore them from historical perspective. Healy and Palepu (2000) have designed an interesting catalog of research problems in accounting disclosure. This is quoted here in Table 1.

Table 1. Research questions in disclosure framework (Healy i Palepu 2000)

1. Regulation of disclosure	<ul style="list-style-type: none"> <li>– Why is there a need for regulation of disclosure in capital markets? What types of disclosures should be regulated and which should not?</li> <li>– How effective are accounting standards in facilitating credible communication between managers and outsider investors? What factors determine their effectiveness?</li> <li>– Which mandated disclosures should be recognized directly in the financial statements and which should be included as supplemental disclosures?</li> </ul>
2. Auditing / intermediaries and disclosure	<ul style="list-style-type: none"> <li>– How effective are auditors in enhancing the credibility of financial statements? What factors influence auditors’ effectiveness?</li> <li>– How effective are financial analysts as information intermediaries? What factors influence their effectiveness?</li> <li>– How does corporate disclosure affect analyst coverage of firms?</li> </ul>
3. Managers disclosure decisions	<ul style="list-style-type: none"> <li>– What factors affect management’s disclosure choices?</li> <li>– What is the relation between disclosure, corporate governance, and management incentives? What role do boards and audit committees play in the disclosure process?</li> </ul>
4. Capital market consequences of disclosure	<ul style="list-style-type: none"> <li>– How do investors respond to corporate disclosures? Are firm disclosures made outside the financial statements credible?</li> <li>– Do investors evaluate disclosures that are included directly in the financial statements differently from those that are included as supplemental disclosures?</li> <li>– What factors influence investors’ perception of the quality of capital market disclosures across economies?</li> <li>– How does disclosure affect resource allocation in the economy?</li> </ul>

Source: Healy i Palepu (2000)

Table 1 illustrates the research range in the context of disclosure. This paper concentrates on a relationship between disclosure and investor protection. There is no such question specified in Table 1 because the connection “disclosure – investor protection” is somehow associated with all 4 areas listed there.

## 6. Research on the association between disclosure and investor protection

Relationship between disclosure and investor protection is being studied extensively. Along with the research discussions to be followed in the journals quoted in section 3 it is worth to mention the surveys by Roberts, Weetman and Gordon (2008), Healy and Palepu (2001), Leuz and Wysocki (2008).

As it has been indicated above, disclosure regulations and disclosures as such may not have unquestionably positive impact on investor protection. From the research in the area of empirical corporate finance and accounting it is difficult to extract the list of variables appropriately representing investor protection. In fact, this area includes mostly legal issues being hardly measurable i.e. expressible quantitatively.

The research reports on quantitative approach to disclosure and investor protection cover wide range of issues, including theoretical considerations on mathematical economics trying to prove that globalization influences investors behaviour in regard to disclosure (e.g. Stulz 2008) and ranging to time series analyses of returns showing that the new disclosure regime significantly alters the properties of such time series (see Goto, Watanabe and Xu 2009).

Quantitative research on disclosure and investor protection can be grouped into cross-country comparative analyses, research on specific type of disclosure and single country studies. The following sections present exemplary studies from each group.

### **6.1. Comparative cross-country studies**

Arping and Sautner (2010) made use of „natural experiment” created accidentally by cross-listing of European stock in the US after Sarbanes-Oxley Act (SOX). Changes in disclosure of these companies have been compared with similar European firms not listed in the US. Altogether 2500 companies from EU-15 were examined. The transparency of a company was measured by accuracy and dispersion of revenues forecasts by companies’ analysts. It turned out that European stock quoted in the US became more transparent after introduction of the SOX provisions. This is especially visible for the companies representing financial services sector and technology sector.

Using the sample of 951 companies from 38 countries Huang and Zhang (2008) have shown that higher level of disclosure diminishes possibilities of insiders to accumulate cash and to expropriate minority shareholders. The disclosure variable was represented by *Standard & Poor's T&D Rating*. The explained variable in this research is Tobin’s  $Q$ , i.e. the ratio of market value of assets to its book value where the assets market value is calculated as the assets book value minus book value of capital plus market value of capital.

Hope (2003) found that the level of disclosure in a given country (represented by CIFAR index) might be determined not only by legal system but also by the national culture. The sample originated from 39 countries and the influence of culture was measured by means of 4 specific variables used previously in the research on dimensions of national culture. It has been shown that both legal origin (code law or common law) and culture of the country have

the impact on the disclosure level. In addition, common law countries have higher disclosure indices than code law countries.

Renders and Gaeremynck (2005) have examined how the earlier introduction of IFRS (International Financial Reporting Standard) by European countries is tied with the investor protection. The research outcome shows that IFRS is more likely adopted in countries with strong laws protecting investors and/or extensive corporate governance recommendations where the loss of private benefits following IFRS-adoption is lower. The results confirm that corporate governance recommendations are as effective as tough laws in stimulating IFRS-adoption. Therefore, by improving corporate governance codes, countries can reduce the extraction of private benefits by managers and improve the quality of the financial information.

Bushman, Piotroski and Smith (2004) examined the corporate transparency on the basis of data from 45 countries. The variables taken into account include: six disclosure variables (including CIFAR value), three variables from the area of private information, acquisition and communication and one variable showing the extent of the information dissemination. Factor analysis of the data revealed two major factors. First may be regarded as representing financial transparency since it captures intensity and timeliness of financial disclosures, their interpretation and dissemination. The second factor represents governance transparency and captures the intensity of governance disclosures used by outside investors to hold management accountable. Governance transparency factor is related to country's legal/ judicial regime: this transparency is higher in countries with common law legal origin and high judicial efficiency. Financial transparency factor primarily is related to political regime: this transparency is higher in countries with low state ownership of enterprises, banks and low risk of state expropriation of firms' wealth.

## **6.2. Research on specific type of disclosure**

Significant research findings concern specific type of disclosure. The most important single disclosure as the effect of examining company's financial statements is obviously the going concern uncertainty disclosure. Martin (2000) has compared the sample of 61 French and German companies with the sample of 61 US firms (the period of 1987-1991), both samples being chosen from set of equities experiencing rather small returns. The going concern uncertainty rates (in the auditor's report or in the board report) were significantly for U.S. firms than for firms from France and Germany. Control variables included firms' characteristics which may be tied with the going concern opinion. The paper concludes that even though

prescriptions for the going concern uncertainty disclosure in Europe and in the US are the same, the actual disclosures across countries may not have the same meaning.

Corporate social responsibility (CSR) disclosure was studied e.g. by Newson and Deegan (2002). The CSR questions are currently in the focus of corporate governance research worldwide. Newson and Deegan (2002) have examined the CSR disclosure policies in large multinational corporations in Australia, Singapore and the South Korea. The results of the survey among these companies show that transnational firms do not respond to “global expectations” as much as they react to public expectations in the countries of their residence. In addition, the country of origin and the sector of industry do significantly influence practices of CSR.

Dhaliwal, Zhen-Li, Tsang and Yang (2009) have examined factors determining voluntary CSR reporting. The CSR reports selected finally to the sample represent 196 US companies and compose 679 observations from the period of 1993-2008. The explained variable is dummy and equals one if the firm discloses stand alone CSR report. The model employed in the study is binomial logit, also binomial logit with 1-period lag – for taking care of possible endogeneity of equity capital. Firms disclose CRS usually because they expect reduction in firms’ cost of equity capital, so the voluntary disclosure of CSR should be associated with lowering of the cost of equity capital (but in the time of disclosure the association between the fact of disclosure and the cost of equity capital should be positive). The lagged model allowed for showing that the previous cost of equity capital is positively related to probability of disclosing CSR for the company. Firms with high cost of equity capital tend to release corporate social responsibility reports. Also, the reporting firms with relatively good social responsibility performance (higher than the average) enjoy a reduction in the cost of equity capital. Furthermore, firm with exceptional CSR performance attract dedicated institutional investors and the coverage of analysts.

The area of business ethics incorporates the most sensitive types of disclosure. Adams and Kuasirikun (2000) have examined disclosure connected with ethical issues by chemical and pharmaceutical companies originated in the UK and Germany. From the examination of annual reports for 1995 of companies listed in “The Times” it turned out that German firms were better than British in terms of reporting ecological and ethical issues.

Holland and Boon Foo (2003) analyzed ecological disclosure from annual reports for the year 2000 for 37 companies from UK and US. The British companies usually reported on the policy on environment protection and on the awards received for ecological projects. On

the other hand, the firms from the US reported mostly on environmental expenditure and on the discussion about the risks associated with environmental protection.

### 6.3. Single country studies

Numerous studies deal with the single country disclosure issues. Lopes and de Alencar (2008) who created *BCDI: Brazilian Corporate Disclosure Index* (see above section 4) have estimated models regressing *BCDI* against a number of variables. Data is composed by the panel of 50 shares with highest liquidity on São Paulo Stock Exchange (BOVESPA) on December 2005. Major results are as follows: there is significant negative association between disclosure and cost of equity capital. Increase in one point in *BCDI* results in a decrease of 14 basis points in cost of equity capital. This relation is more pronounced for firms which receive less attention from analysts and have dispersed ownership structures: increase of one point in *BCDI* results in a reduction of 26 (for firms with less coverage) and 27 (for firms with dispersed ownership) basis points in cost of capital.

Ben Ali and Latrous (2009) have concentrated on those elements of corporate governance which influence disclosure quality in the context of ownership concentration where the main agency conflict is between controlling and minority shareholders. For the sample of 86 firms from France (data for 2004) they found negative association between disclosure quality and family control, double voting shares (often encountered in France) and both ownership and control concentration. The positive association has been seen between disclosure quality and the presence of executive stock options plans as well as the proportion of independent members in the supervisory board.

Beekes, Brown and Chin (2007) (referred to in section 3 above) have found for the sample of Canadian firms that the companies with higher level of governance release more documents to the stock market. Sample was composed of 216 firms rated in the November 2004 Board Shareholder Confidence Index (set up by *Clarkson Center for Business Ethics and Board Effectiveness*). The explained variable in one of the models is natural log of the number of documents released by the company over the 250 trading days ending 10 trading days after the company's fourth quarter earnings report. The explanatory variables are: corporate governance BSCI rating, firm size (measured by log of capitalization) and the dummy variable "good news" equal to 1 if the returns of the company's share price outperforms the market over the 250 trading day period, and zero otherwise. Other models examined the timeliness, i.e. the speed with which the released information is shown in the equity prices. The results

indicate that better-governed Canadian firms release more documents and that value-relevant information about them is integrated into share prices more rapidly.

Patel and Dallas (2002) have shown that disclosure ratings published as *Standard & Poor's T&D Ratings* for the US companies are correlated with the determinants of expected returns such as market risk, price/book value ratio (*P/BV*) and firm size (expressed by market capitalization). Correlation of disclosure with market risk turned out to be negative, with *P/BV* – also negative but nearly not significantly equal to zero, with the firm size – highly positive.

Ahmad-Zaluki and Wan-Hussin (2010) analyzed the relationship between the corporate governance level and the quality of financial information disclosed – for the sample of 235 Malaysian companies that went public (IPO) in the period of 1999-2006. The quality of disclosure was measured by the error of revenue forecasts prepared by the company's management. It turned out that the companies with a higher percentage of non-executive directors in the audit committees and larger audit committee size exhibit greater forecast accuracy (i.e. higher quality of this disclosure). The results also suggest that effective corporate governance is a credible signal of improving the quality of financial information.

## **7. Polish corporate disclosure index (*PCDI*) and investor protection**

### **7.1. Composition of *PCDI***

Polish Corporate Disclosure Index (*PCDI*) is the outcome of the research conducted by Warsaw School of Economics (Chair of Managerial Accounting jointly with the Department of Applied Econometrics) in 2009-2010. This is the first published index of disclosure for Polish companies (see: *Wpływ...* 2010).

*PCDI* value represents the disclosure quality of three annual reports: financial statement, company report (management report) and corporate social responsibility (CSR) report. There are 9 areas of reporting taken into account. In each area a number of disclosure issues were examined. Altogether the disclosures were investigated in 28 elements of annual reports (see Table 2). For each company the disclosure quality was composed from the answers to 172 questions.

Polish corporate disclosure index (*PCDI*) is calculated as the weighted average of all 172 disclosure items examined for each company. The weights were generated by the group of experts composed of 12 accounting specialists, including 5 certified accountants. The following weights are applied:

Table 2. Disclosure types examined for the *PCDI*

Area of reporting:	In each area the disclosures concerned the following issues are examined:
I. Financial statement (weight of 66%) <ol style="list-style-type: none"> <li>1. Non-material assets</li> <li>2. Financial risk</li> <li>3. Fair value</li> <li>4. Accounting for derivatives</li> <li>5. Leasing</li> <li>6. Segments of activity</li> <li>7. Reserves</li> </ol> II. Management report (weight of 24%)                     III. Corporate social responsibility (CSR) report (weight of 10%)	I. Financial statement disclosure (in 7 areas) <ul style="list-style-type: none"> <li>accounting policy</li> <li>additional information and disclosure – mandatory</li> <li>additional information and disclosure – voluntary</li> </ul> II. Management report disclosures <ul style="list-style-type: none"> <li>financial and non-financial data</li> <li>prospective information</li> <li>data on management and on shareholders</li> <li>information about non-material assets</li> </ul> III. CSR report disclosures <ul style="list-style-type: none"> <li>communication</li> <li>credibility and reliability</li> <li>completeness</li> </ul>

Source: Warsaw School of Economics, Chair of Managerial Accounting and the Institute of Econometrics

- 1) weights  $s_f, s_d, s_r$  for three reports (financial statement, management report and CSR report):  $s_f = 66\%, s_d = 24\%, s_r = 10\%$ ;
- 2) weights  $w_i$  for 9 areas of reporting (including 7 areas in financial statement); weights indicate how important are the disclosures in this area?:  $w_i = 1$  to 5 (no important to very important);
- 3) weights  $g_{ij}$  for each type of disclosure in each of 9 areas: sum of  $g_{ij} = 1$  for each area; there are 28 weights  $g_{ij}$ ;
- 4) for  $ij$ -th type of disclosure the rank to each specific question is assigned (from 0 to 4 where 0= “no disclosure”, 1=“poor disclosure” to 4=“very good disclosure level”); average rank for  $ij$ -th type of disclosure =  $p_{ij}$ .

The formula for *PCDI* is as follows:

$$PCDI = s_f \sum_{i=1}^7 w_i \sum_{j=1}^3 g_{ij} p_{ij} + s_d w_8 \sum_{j=1}^4 g_{ij} p_{ij} + s_r w_9 \sum_{j=1}^3 g_{ij} p_{ij}$$

After applying the appropriate weights  $s, w$  and  $g$  one may obtain the interval of possible values of *PCDI*. This is the range from 0 to 74.13. “The best” disclosure would be associated with the *PCDI* value of 74.13 when all  $p_{ij}$  values are equal to 4. Lower values of *PCDI* are “good disclosure” for  $PCDI = 55.60$  (i.e. all  $p_{ij}=3$ ), “average disclosure” for  $PCDI = 37.06$  (i.e. all  $p_{ij}=2$ ), “poor disclosure” for  $PCDI = 18.53$  (i.e. all  $p_{ij}=1$ ) and “no disclosure” for  $PCDI = 0$  (i.e. all  $p_{ij}=0$ ). Obviously, the range from 0 to 74.13 might be rescaled to a more suitable interval, e.g. from 0 to 100.

## 7.2. PCDI for the companies listed on Warsaw Stock Exchange

The disclosure items have been examined carefully for 48 companies listed on Warsaw Stock Exchange for the years 2005, 2006 and 2006. The companies selected to the sample were intentionally chosen from the following sectors: banks, chemical sector, media, food processing, telecom sector.

PCDI values obtained for each company after inspecting the reports covering years 2005, 2006 and 2007 are presented in Table 3.

Table 3. Polish corporate disclosure index values for 48 listed companies (2005, 2006, 2007)

<i>PCDI</i> values for	2005	2006	2007	<i>PCDI</i> values for	2005	2006	2007
BPH	41.92	44.72	42.92	Z Ch Police	31.72	32.43	39.41
Bank Handlowy	40.35	40.43	42.54	Agora	37.93	40.63	40.52
Millenium	44.18	45.84	47.17	ATM Grupa	33.71	33.98	34.37
Bank Ochrony Środowiska	38.44	39.46	46.62	MNI	15.55	27.49	25.07
Pekao S.A.	43.94	45.36	48.76	MUZA	14.63	23.29	23.07
BZ WBK	38.31	38.84	40.78	PPWK	24.20	25.81	31.05
BRE	43.73	43.11	46.64	TVN	44.05	43.00	43.91
DZ Bank	25.51	26.65	27.62	WSiP	29.91	31.37	33.77
ING	46.68	46.49	49.14	ADS	16.76	18.38	29.81
Kredyt Bank	42.82	43.80	44.64	Ambra	21.45	29.26	31.03
PKO BP	38.80	38.63	42.94	Beef-San	26.74	28.46	29.58
Bioton	29.29	31.34	32.75	Elstar Ols	17.54	27.78	25.34
Boryszew	33.24	35.45	39.36	Żywiec	35.70	41.41	44.74
Ciech	45.91	47.71	51.16	Graal	28.16	30.04	32.21
Decora	29.07	32.76	34.19	Indykpol	27.11	28.04	32.42
ZTS ERG	24.72	29.92	30.36	Jutrzenka	28.08	29.00	35.70
Śnieżka	32.76	32.97	33.59	Hop	41.01	33.87	33.89
Lotos	38.44	40.04	44.32	Duda	22.28	24.37	27.58
PKN Orlen	49.24	50.69	58.63	Pepees	42.07	35.63	33.45
PGNIG	42.55	42.71	48.24	ZT Kruszwica	25.04	32.43	40.06
Plast-Box	21.54	25.76	26.99	ATM	21.54	36.21	38.56
Stomil Sanok	28.35	28.62	31.81	Netia	38.91	41.19	45.68
Dwory	30.71	37.88	42.95	TPSA	43.76	49.12	51.05
Ropczyce	31.63	32.78	35.61	Tell	30.76	27.93	28.01

This exercise provided the minimum *PCDI* value of 14.63 (for the year 2005) and maximum *PCDI* value of 58.53 (for the year 2007). This may indicate that this measure discriminates companies adequately: from “poor disclosure” to “very good disclosure”.

The average *PCDI* for the companies chosen to the sample is equal to 49.24 for 2005, 50.69 for 2006 and 58.63 for 2007. This, in turn, may mean that Polish listed companies significantly improved the degree of disclosure through annual report during the period of 2005-2007.

### 7.3. *PCDI* and investor protection

In order to investigate the relationship between *PCDI* and the investor protection the regression models with *PCDI* as the only regressor and the investor protection variables as regressands were examined.

The explained variables in these regression models are proxy investor protection variables: audit quality, stock price variability, Pentor index. In detail they are defined as follows:

*zmiennosc* = coefficient of variation of all stock price quotations in a given year (Assumption the larger *zmiennosc* the lower investor protection),

*kat\_aud* = category of auditor for the company's books: 1=big four (PwC, Deloitte, Ernst&Young, KPMG), 2=major regional and domestic auditors (Grant Thornton Frąckowiak, BDO Numerica), 3=other auditors (Assumption: the better auditor the better investor protection),

*pentor* = value of the PENTOR index (published by “Puls Biznesu”) for the company; the index is the outcome of a questionnaire for stock exchange analysts, advisors and brokers on: how the company is perceived by the market, what are the strengths of managers, quality of investor relations, what are the company's prospects etc. (Assumption: the higher *pentor* value the better investor protection).

The quantitative variables *zmiennosc* and *pentor* served as regressands in the linear regression models with *PCDI* as the only regressor. The qualitative *kat\_aud* variable was used as the regressand in ordered logistic regression, again with *PCDI* as the only regressor.

The estimation results for the appropriate models with *PCDI* as the regressor variable are as follows:

signs of *PCDI* coefficient estimates

<u>regressand</u>	<u>model</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>
<i>zmiennosc</i>	linear regression	insignificant	negative	negative
<i>kat_aud</i>	ordered logistic	negative	negative	negative
<i>pentor</i>	linear regression	positive	positive	positive

Main outcome of this research attempt suggests that *PCDI* is significantly linked with the variables representing investor protection. Higher value of *PCDI* is associated with the lower variability of stock prices as well as with the better the category of auditor. The better management, the better perception of the company by the market, i.e. the better corporate governance (represented by *pentor* index) is associated with higher *PCDI*.

The results may be relevant to other companies satisfying criteria of selecting to the sample, i.e. Polish listed companies from five sectors: banking sector, chemical sector, media sector, food sector, telecom sector (assuming they produced annual reports for 2005-7). Further research in this direction might include examination of other variables representing investor protection such as discrepancy between earnings and earnings forecasts, variability of stock prices/returns in relation to sector variability, annual report publication date etc.

## 8. Final remarks

The accounting disclosure research becomes today especially important in connection to the issues of corporate governance. The confidence to the information disclosed by companies is much lower than it used to be. In the same time, the prospective of capital markets require better protection of their main participants, i.e. the investors.

Paper shows major research fields in the area of measuring the level of accounting disclosure and of exploring various issues associated with accounting disclosure. One obvious question is how the disclosure is connected to investor protection. This issue has been described here in the context of the countries' legal systems and in the relation to corporate governance subjects. Major part of the paper presents the examples of quantitative research with disclosure questions in the main role. This includes cross-country studies, research on specific type of disclosure and single country studies.

New results presented in the paper include composition and application of Polish Corporate Disclosure Index (*PCDI*). *PCDI* has been composed for 48 companies listed on Warsaw

Stock Exchange for the years 2005, 2006 and 2007. Subsequently, *PCDI* was used as the regressor variable in a number of models explaining various investor protection measures. The outcome of this research is that *PCDI* is significantly associated with the variables representing investor protection. Higher values of *PCDI* are linked with the lower variability of stock prices, with the better the category of auditor as well as with the better management and the better perception of the company by the market.

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