FACTORS INFLUENCING THE DISCLOSURE OF ADDITIONAL FINANCIAL AND NON-FINANCIAL INFORMATION BY LARGE ENTERPRISES

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Abstract

Nowadays, more than ever, stakeholders are demanding that additional information are disclosed in addition to financial information as part of corporate reporting. This need is being recognized by regulators, who have begun to enact laws requiring large companies to disclose at least the required information and financial information. This study aims to examine some of the possible company characteristics that may influence the extent of information disclosure, particularly the direction of their influence and significance. The study was conducted on twenty (23.53%) listed companies operating in the real sector (non-financial sector) on the Zagreb Stock Exchange. Initially, the content analysis method was used to analyze the reports. In addition, multilinear regression was conducted to measure the influence of specific company characteristics. The

research results revealed that the type of auditor, ownership structure, and size of the board of directors have a statistically significant positive influence on the quality of published financial and non-financial information. In contrast, the quotation days have a negative but not statistically significant influence at the 5% significance level. Finally, even though the overall results regarding the disclosure quality can be interpreted as satisfactory, there is room for further improvement regarding financial and non-financial reporting transparency.

Keywords: *European regulation, Non-Financial Reporting Directive, financial and non-financial disclosure, information and reporting quality, Croatia*

1. INTRODUCTION

According to Sever Mališ & Brozović (2017), the financial reporting process is *a "corporate governance mechanism implemented to achieve transparency and protect*

stakeholders' interests, but it can also be viewed as a result of successful corporate governance." The financial statements that the company prepares differ depending on its size. In addition, the content and

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material aspects of financial reports depend on the set of financial reporting standards that the company applies along with other legal requirements. Since the scope and complexity of micro, small and medium-sized enterprises are often more straightforward than those of large companies, the requirements for preparing financial statements are simplified. These companies generally apply the underlying national financial reporting standards, which are more straightforward than international standards. On the other hand, most countries have adopted International Financial Reporting Standards (IFRSs), which large companies are often required to apply because they often operate internationally. Their reports have become standardized or comparable globally by applying the same financial reporting standards.

This study aims to assess the existence, direction, and significance of the influence of selected factors on the quality of disclosure of additional (non-)financial information within the annual report or a similar report, particularly on sustainability. The content analysis method was used to measure the quality of disclosed information, while a regression model was built to assess the impact of the factors studied. The paper is divided into six chapters, with the first and last chapters being the introduction and discussion. The second chapter focuses on the regulatory framework of non-financial reporting, followed by an overview of previous studies investigating the impact of various factors on the quality of reporting. The fourth chapter presents the research methodology, followed by an interpretation of the results obtained.

2. THE ROLE OF BINDING AND NON-BINDING FRAMEWORKS OF CORPORATE REPORTING

2.1 Regulatory framework as a basis for mandatory corporate reporting

The obligation and responsibility for public interest entities to communicate, i.e., report on non-financial information, were introduced into the EU law by Directive 2014/95/EU (2014) (Non-Financial Reporting Directive – NFRD) amending the Accounting Directive 2013/34/EU. The NFRD introduces the rules for disclosing non-financial information by *"large undertakings which are public-interest entities exceeding on their balance sheet dates the criterion of the average number of 500 employees during the financial year"*. These companies must disclose information on *"the undertaking's development, performance, position and impact of its activity, relating to, as a minimum, environmental, social and employee matters, respect for human rights, anti-corruption and bribery matters."*

Directive 2014/95/EU was transposed into the Croatian legal system by the Accounting Act (Official Gazette, No. 78/15, 134/15, 120/16, 116/18, 42/20, 47/20). According to the Accounting Act, entrepreneurs are classified into *"micro, small, medium-sized and large depending on the indicators determined on the last day of the business year preceding the business year for which financial statements are prepared."* The indicators on the basis on which entrepreneurs are categorized are the value of total assets, total income, and the average number of employees during the fiscal year.

This study analyses only large companies. According to the Accounting Act, these are companies that meet at least two

of the following three criteria: the value of total assets over EUR 20,000,000, the value of total revenues over EUR 40,000,000, and the average number of employees over 250 employees. In addition, according to the Accounting Act, large companies also include financial institutions, which are defined in more detail in Article 5 (5): 2 of the Accounting Act (Accounting Act, 2015).

According to the Accounting Act, large companies in the Republic of Croatia must prepare and publicly disclose annual financial statements: *"balance sheet, income statement, statement of other comprehensive income, statement of cash flows, statement of changes in equity and notes to the financial statements."* In addition, large companies are required to prepare and publish annual reports. The Accounting Act also prescribes the structure of the annual report. According to Article 21, the annual report consists of the annual financial statements (listed above), an audit report (all large companies are subject to financial statements audit), a statement on the application of the Corporate Governance Code (applies to all public interest entities and large companies listed on a stock exchange in an EU country), a report on payments to the public sector (applies to public interest companies engaging in mining and quarrying or primary logging), a management report, and a non-financial report (applies to companies subject to the NFRD regulations).

For periods beginning on or after 1 January 2017, large public-interest entities with an average of more than 500 employees during the reporting period are required to prepare a non-financial report. As stipulated in the Accounting Act and the NFRD, a non-financial report should contain data and information relevant for a stakeholder to understand the company's development, results achieved, financial position, and impact of business activities on sustainability issues (at least regarding environmental, social, and employee matters, human rights, and anti-corruption and anti-bribery).

Financial information, primarily accounting or historical information, is insufficient for stakeholders who may be interested in financial statements, primarily investors. This makes financial statements insufficient for making business decisions. Namely, they primarily provide financial information and bases for financial analysis. Still, other non-financial internal and external information and non-quantitative information must also be considered (Brozović et al., 2020). For this reason, there is an increasing demand for non-financial information related to both the explanation of past events and projections of the company's future business performance. This is confirmed by the legal requirement to prepare a non-financial report. In addition to the financial and non-financial data and information that must be published following legal requirements, companies are increasingly publishing additional information proposed by national and international professional associations.

2.2. Guidelines from professional associations as related to additional reporting

Numerous international professional associations have issued recommendations and guidelines to improve and standardize additional financial and non-financial reporting. Most of the guidelines and reporting frameworks issued are related to non-financial reporting, especially reporting on sustainability, environmental and social issues, and anti-corruption. Table 1 systematizes some of the main reporting guidelines issued by major international organizations.

Table 1. Systematization of guidelines for reporting on responsibility and sustainability

Organization	Reporting guidelines
Global Sustainability Standards Board (GSSB)	GRI Sustainability Reporting Standards (GRI Standards) (GRI, n.d.)
International Integrated Reporting Council (IIRC) and Global Reporting Initiative (GRI)	International Integrated Reporting Framework (International <IR> Framework) (Value Reporting Foundation, 2021)
IIRC (program: the Integrated Reporting Technology Initiative)	Technology primer for integrated reporting – A Chief Information Officer guide (IIRC & Technology Initiative, 2018)
IIRC, Institute of Chartered Accountants of Scotland (ICAS), and Green Economy Coalition	The Sustainable Development Goals, integrated thinking, and the integrated report (Value Reporting Foundation, n.d.)
CDP, Climate Disclosure Standards Board, GRI, IIRC, International Organization for Standardization and Sustainability Accounting Standards Board	The Sustainable Development Goals and the future of corporate reporting (Corporate Reporting Dialogue, 2019)
United Nations Global Compact and Global Compact LEAD	A Global Compact for Sustainable Energy – A Framework for Business Action (United Nations Global Compact, 2011)
GRI and UN Global Compact	Integrating the Sustainable Development Goals into Corporate Reporting: A Practical Guide (United Nations Global Compact, 2018a)
GRI, Principles for Responsible Investment, and UN Global Compact	In Focus: Addressing Investor Needs in Business Reporting on the SDGs (United Nations Global Compact, 2018b)
UN Global Compact	Blueprint for Business Leadership on the SDGs (United Nations Global Compact, 2017)
Organization for Economic Co-operation and Development (OECD)	OECD Guidelines for Multinational Enterprises (OECD, 2011)
OECD	OECD Due Diligence Guidance for Responsible Business Conduct (OECD, 2018)
International Organization for Standardization (ISO)	ISO 26000 – Social responsibility (ISO, n.d.)

The above guidelines are among those most used by multinational companies. According to the 2017 KPMG survey, which observed 4,900 companies (the 100 largest by total revenue, from 49 countries), 63% of companies used the GRI framework for non-financial reporting. Furthermore, the same study found that the GRI framework was also used by 75% of the 250 largest companies in the world (by total revenue, from the 2016 Fortune 500) (KPMG, 2017). Similar results were provided by a survey conducted by KPMG in 2015. At that time, the GRI framework was used by 60% of the 4,500 largest companies from 45 countries (by total revenue) and by 74% of the world's largest companies (by total revenue) for corporate responsibility reporting (KPMG, 2015). According to the above studies, there is a trend toward the most frequent and increasing use of the GRI framework among the world's largest companies. This trend is driven by significant global initiatives for responsible management and

use of natural resources and investors who require transparency in reporting, both in financial and non-financial reports.

Although large companies in Croatia are not required by law to report according to any guidelines, several large companies operating in Croatia prepare their sustainability reports according to the guidelines of the GRI framework and the UN Global Compact. Although the obligation to prepare a non-financial report for public interest entities employing more than 500 people has come into force, several Croatian companies have already published non-financial information before this obligation. This is also contributed by the Croatian Business Council for Sustainable Development (HR PSOR), a non-profit organization in which representatives of Croatian companies are nominated as members of the Assembly and the Boards of Directors, who can be considered pioneers of non-financial reporting. As it is a part of voluntary reporting, the report's name is not required by law, so companies usually refer to it as Sustainability Report, Sustainable Development Report, Corporate Social Responsibility Report, or Environmental Report. From the publicly available reports published on the official website of HR PSOR (2020), it is evident that some companies have been reporting on environmental and social issues, i.e., socially responsible actions, since 2006. An empirical study was conducted to analyze the influence of individual company factors on the quality of the reports in more detail.

3. PREVIOUS STUDIES AND HYPOTHESES DEVELOPMENT

Several studies have been conducted in the Republic of Croatia on publishing information in (non-) financial reports. The extent of publication of (non-)financial information in Croatian and Slovenian joint-stock companies whose shares are listed on the stock exchange was investigated by Pervan (2006) by using a multiple linear regression model. The study results confirm that the amount of disclosed information is significantly and positively influenced by the company's size, profitability, the number of shareholders, and the turnover of shares on the stock exchange.

Rogošić et al. (2010) concluded that companies with ISO 9001 certification publish more information, such as the ownership structure and code of ethics, as well as the audit report, management report, and annual general meeting report, on the company's official website than companies that do not have this certificate. Aljinović Barać et al. (2014) proved that disclosure is significantly correlated with the company size, listing status, and business activity, while profitability and ownership structure showed no significant influence. A study conducted by Bartulović and Pervan (2014) on a sample of companies whose shares are listed on the Zagreb Stock Exchange and the stock exchanges of neighboring countries confirmed that the listing status significantly influences the degree of disclosure, return on invested capital, asset value, and area of activity. Aljinović Barać and Granić (2015) also conducted a study on the level of transparently reported information in the annual report of Croatian companies. They concluded that the level of disclosed information is deficient.

More than 30 years ago, Chow and Wong-Boren (1987) conducted a study in which they concluded that Big 6 audit firms could more easily maintain their independence from clients' requests for nondisclosure of certain information because they must maintain their reputation (in Whiting

& Woodcock, 2011), while on the other hand, it is sometimes more important for smaller audit firms to meet clients' demands to ensure continued cooperation. That larger audit firms encourage companies to disclose more information in an annual report was also confirmed by a study by DeAngelo (1981). One-third of all companies listed on the Istanbul Stock Exchange found that companies whose auditors belong to the top seven group disclose more information than others (Ağca & Önder, 2007).

An analysis of the impact of the auditor type (Big 4 vs. non-Big 4) (among other factors) on the level of intellectual capital information disclosed was conducted by Whiting and Woodcock (2011). They found that the level of disclosure of intellectual capital information is low, but companies whose auditors belong to the Big 4 group disclose more intellectual capital information. Akhtaruddin and Haron (2010) also used the subdivision of companies by the type of auditor as a control variable that showed a positive attitude towards the level of disclosure.

A study conducted by Bilić (2016) on a sample of Croatian companies found that companies whose financial statements were audited by the Big 4 audit firms had a statistically significantly higher quality of voluntary reporting. On the other hand, some studies have shown that the type of auditor does not affect the amount of voluntarily disclosed accounting information (Hossain et al., 1995; Barako et al., 2006). Considering that the quality of the audit depends on the extent to which the user can rely on the audited reports (Žager et al., 2016) and that Big 4 audit firms are less dependent on individual clients, the first hypothesis is as follows:

H1: There is a positive relationship between the type of auditor and the disclosure index.

This study was conducted on a sample of quoted companies. Whether the days of listing impact the information disclosed has not yet been studied, so the authors wanted to investigate this variable. Companies about to enter the capital market need to prepare for the initial public offering (IPO) and do their best to attract potential investors. The authors hypothesize that companies new to the stock exchange will put more effort into reporting than companies that have been on the stock exchange for a more extended time. For this study, the authors did not have information on the total number of days on the stock exchange but rather the days of listing since the last change in the company's position on the stock exchange. This variable was used as a proxy for listing days. Assuming that companies that have been listed on the stock exchange for a more extended period put less effort into reporting, the second hypothesis is:

H2: There is a negative relationship between days of listing and disclosure index.

When assessing the degree of impact on additional disclosure, a commonly used independent variable is ownership structure. Numerous studies have been conducted on ownership structure, including ownership concentration and its structure determined by family, foreign, institutional, and managerial ownership (Barako et al., 2006).

The studies conducted so far show ambiguous results. Hossain et al. (1994) found a negative relationship, while Haniffa and Cooke (2002) found a positive relationship; McKinnon and Dalimunthe (1993) found a weak relationship, and Craswell and Taylor (1992) found no relationship at

all (in Barako et al., 2006). It should be emphasized that the authors mentioned above assume a positive relationship between ownership structure, where a smaller number of shareholders hold a more significant proportion of shares and the extent of disclosure of additional information.

In contrast to this assumption, Barako et al. (2006) found a significant but negative relationship between a less concentrated ownership structure and the amount of information published. On the other hand, Allegrini and Greco (2013) measured the ownership structure as a share or percentage of ordinary shares held by shareholders holding less than 2% of the total value of shares. However, according to the results of their research, no statistically significant effect of the ownership structure on the extent of disclosed information was found, although the relationship is positive. Given the different results of recent studies, the third hypothesis is as follows:

H3: There is a positive relationship between ownership structure and disclosure index.

Several authors have also investigated the influence of the size of the board of directors on the level of additional information disclosed, especially in the annual report. The size of the board is defined by the total number of directors that make up the board. Allegrini and Greco (2013) demonstrated a significant positive relationship between board size and voluntarily disclosed information in the annual reports of Italian listed companies. The same conclusion was reached by Rouf (2011), who studied a sample of companies listed on the Dhaka Stock Exchange. Therefore, the fourth research hypothesis is as follows:

H4: There is a positive relationship between the size of the board of directors and the disclosure index.

4. METHODS

4.1. Sample and statistical tests selection

The research sample includes 20 large companies in the non-financial (real) sector listed on the Zagreb Stock Exchange (ZSE, 2020). The total number of non-financial sector companies listed on the ZSE is 85, which means that the research sample includes 23.53% of all non-financial sector companies listed on the ZSE. First, all companies were divided into two groups: those whose auditor was one of the Big 4 audit firms and those with a different auditor for the analyzed year. Ten companies were randomly included in the study sample using the RANDBETWEEN formula in Excel for each group. The financial and non-financial reports analyzed were downloaded from the Public register of annual financial reports and the official websites of the selected companies, with 2017 serving as the year of observation.

A statistical test of multilinear regression was conducted to test the established hypothesis. The content analysis method was used to measure the quality of the disclosed information in the observed reports. Based on previous studies, a list of 64 items was created to assess whether a company disclosed the information or not (dummy variable). All observed items form a disclosure index (DI), used to approximate disclosure quality (Appendix 1). Unlike studies based on the number of selected keywords disclosed in a report or the proportion of sentences containing selected keywords, this research was conducted using a qualitative approach by assessing content over

form. In other words, the DI of each company is presented using a dummy variable where label one was assigned to the item of DI if the information was disclosed in a way that provided new insights to the user. Otherwise, information that was not disclosed and information that did not provide relevant insights were labeled with zero value. The DI represents a dependent variable in the regression model, which was calculated for each company in the sample using the following formula:

$$DI = \frac{\sum_{i=1}^{m} d_i}{m},$$

where: i = observed information from the DI, d_i = 0 if information is not disclosed, d_i = 1 if information is disclosed, m = maximum number of disclosed information (64).

Many studies have used DI in research: Botosan (1997) – 35 items, Hossain et al. (2005) – 18 items, Bukh et al. (2005) – 78 items, Ağca & Önder (2007) – 87 items, Akhtaruddin & Haron (2010) – 64 items, Allegrini & Greco (2013) – 60 items, Aljinović Barać et al. (2014) – 38 items, Bartulović & Pervan (2014) – 30 items, Bilić (2016) – 50 items. The average number of items used in these studies is 51. In contrast, this study includes 64 items based on these studies and the non-binding guidelines of international professional organizations.

4.2. Independent variables

The regression model consists of 5 independent variables that influence the extent of information disclosure. These variables are the type of audit firm that audited a company's financial statements (BIG 4), the days a company is listed on the stock exchange (LISTINGDAYS), the ownership structure of a company (OWNSTR), and the size of a company's board (BOARDSIZE). The fifth independent variable represents the control variable and refers to the share of a company owned by the largest shareholder (BIGOWN).

The first independent variable, *the type of audit firm*, represents a dummy variable because the audit firms were divided into two groups. The first group consists of the Big 4 audit firms (Deloitte Touche Tohmatsu Limited – DTTL, PricewaterhouseCoopers – PwC, Ernst & Young – EY, KPMG), while the others belong to the second group. The Big 4 audit firms audited 87% of the financial statements of the companies listed on the ZSE between 2008 and 2014 (Sever Mališ & Brozović, 2016). The second independent variable, *listing days*, measured as a numerical continuous variable, refers to how long the companies' shares are listed on the ZSE. Listing date data were found on the official website of the ZSE. It is important to note that the first listing date was unavailable for a certain number of companies, so the proxy variable was needed. Since the ZSE publishes the date of listing, which refers to the last change in the capital market (e.g., change in the market from "Official Market" to "Leading Market"), these dates were used. It is considered that this variable does not lose relevance, as it is assumed that a company has made some efforts to improve its financial and non-financial reports after such a market change. The third independent variable, *ownership structure*, was measured as a numerical discretionary variable, i.e., the proportion of shareholders who own 2% or less of the total number of shares. The fourth independent variable, *the board size*, represents a numeric continuous variable and is measured by the number of board members. Finally, the fifth independent variable, *the largest shareholder*, was included as a control variable to exclude any influence on the proportion

of treasury shares (since this information was not always disclosed; primarily, only the ten largest shareholders were disclosed).

A systematic overview of the independent variables and their measurement can be found in Table 2.

Table 2. Variables and their measurement

Variable	Term	Measurement
Dependent variable		
DI	disclosure index	share of the total number of disclosed information and the total number of searched information
Independent variables		
BIG 4	type of auditor	Dummy variable; Big 4 auditor = 1, other auditors = 0
LISTINGDAYS	listing days	Listing days from the last available market change
OWNSTR	ownership structure	The total share of shareholders who own 2% of shares or less
BOARDSIZE	board of directors' size	Number of members of the board of directors
BIGOWN	biggest shareholder	Share of the biggest shareholder in total numbers of shares

Source: Authors.

4.3. Model specification

An analysis was performed using a multilinear regression model to test the hypothesis. Ordinary Least Square – OLS method was used. The following model was adopted:

$$DI_i = \alpha + \beta_1 BIG\ 4_i - \beta_2 LISTINGDAYS_i + \beta_3 OWNSTR_i + \beta_4 BOARDSIZE_i + \beta_5 BIGOWN_i + \varepsilon_i,$$

where: i = each observed company from the sample, α = constant value, β = coefficient of direction ε = residual value.

5. RESULTS

5.1. Descriptive statistics

Table 3 shows the descriptive statistics of the dependent and independent variables included in the model. 50% of the observed companies disclosed up to 57% of the items from the DI, while the other 50% disclosed more than 57% of the items. The company with the lowest number of disclosed information disclosed only 14% of it, while the company with the highest value disclosed 82.8% of the observed items. The mean value of shareholders owning 2% of shares or less in the total number of shares is 0.26027, which means they all together own 26% of all shares in a company on average. The number of members of the board of directors ranges from 1 to 6. Finally, as far as the share of the largest shareholder is concerned, the largest single shareholder owns 100% of a company, while the average share among the observed companies is 52.27%.

Table 3. Descriptive statistics

Measures	DI	BIG 4	LISTING DAYS	OWNSTR	BOARDSIZE	BIGOWN
Mean	0.525040	0.500000	4121.250	0.260270	2.850000	0.522735
Median	0.570313	0.500000	5546.500	0.211350	2.500000	0.482250
Maximum	0.828125	1.000000	6036.000	0.913500	6.000000	1.000000
Minimum	0.140625	0.000000	4.000000	0.000000	1.000000	0.045000
Std. Dev.	0.224471	0.512989	2276.198	0.233755	1.785173	0.289252
Skewness	-0.215617	0.000000	-1.080242	1.112721	0.629442	0.209145
Kurtosis	1.582949	1.000000	2.368488	3.961972	2.141692	1.852549
Jarque-Bera	1.828330	3.333333	4.222082	4.898321	1.934566	1.243008
Probability	0.400851	0.188876	0.121112	0.086366	0.380114	0.537136

Source: Authors.

Before conducting further tests, it was necessary to check the normality of the distribution. Since the p-value of all variables is greater than 0.05 at a significance level of 5%, the null hypothesis cannot be rejected, which means that all data are typically distributed. In addition, the normality of the distribution of the residuals was tested. The Jarque-Bera test value was compared with the theoretical value of the λ^2 distribution with 5 degrees of freedom. The theoretical values are: (5) = 11.0705, p-value$_{theor}$ = 0.05. Statistical software Eviews was used to calculate the empirical values: Jarque-Bera = 0.868633, p-value = 0.677707. Since the Jarque-Bera empirical value is below the critical value of the chi-square distribution ($\lambda^2_{0.05}(5)$) and the p-value is greater than 0.05, it can be concluded that the re-siduals are also normally distributed.

5.2. Inferential statistics and analysis

Results of the multiple regression performed using the OLS method are shown in Table 4. The regression analysis results show that only the independent variable *listing days* is insignificant in the model. In contrast, all other independent variables are significant at the 5% significance level, as their p-values are less than 0.05. As hypothesized, all significant independent variables have positive β-coefficients, meaning they have a statistically significant positive effect on DI at the 5% significance level. The regression model interpreted 85.63% of the variation in the DI (R^2 value), which indicates that the model is representative.

Table 4. Estimation of the multiple linear regression model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Dependent Variable: DI Method: Least Squares Sample: 1 20 Included observations: 20				
C	-0.040855	0.169624	-0.240856	0.8132
BIG_4	0.369537	0.054452	6.786451	0.0000
LISTINGDAYS	-9.91E-06	1.09E-05	-0.908380	0.3790
OWNSTR	0.441505	0.191465	2.305924	0.0369
BOARDSIZE	0.044398	0.014833	2.993179	0.0097
BIGOWN	0.345338	0.158457	2.179380	0.0469
R-squared	0.856287	Mean dependent var		0.525040
Adjusted R-squared	0.804960	S.D. dependent var		0.224471
SE of regression	0.099134	Akaike info criterion		-1.541364
Sum squared resid	0.137586	Schwarz criterion		-1.242644
Log-likelihood	21.41364	Hannan-Quinn criterion		-1.483051
F-statistic	16.68322	Durbin-Watson stat		2.109783
Prob(F-statistic)	0.000018			

Source: Authors.

To draw a relevant conclusion on the set hypotheses, additional diagnostic tests must be performed to verify that the original assumptions in the model are met and that the multiple linear regression model is well set up. The original assumptions that need to be tested are the presence of the problem of autocorrelation of the errors, the correlation of the regression variables and their constancy, and the immutability or homoscedasticity of the variance of the error terms.

According to the data from Table 5, which show the correlation matrix of the estimated zero-order correlation coefficients, a very weak or weak correlation of the variables can be observed ($r < \pm 0.4$), except for the estimated correlation coefficient between the *ownership structure* and *share of the largest shareholder,* which shows a strong negative correlation. This was expected, although even this correlation does not exceed the value, potentially causing the problem of multicollinearity. The data on the collinearity of the other independent variables suggest that their values are not high, and therefore, there is no problem with multicollinearity in the established model.

Table 5. Correlation matrix

	BIG_4	LISTINGDAYS	OWNSTR	BOARDSIZE	BIGOWN
BIG_4	1				
LISTINGDAYS	-0.34538	1			
OWNSTR	0.015757	0.04442	1		
BOARDSIZE	0.31610	-0.30278	-0.25233	1	
BIGOWN	-0.33347	0.10845	-0.79363	-0.03441	1

Source: Authors.

In addition, none of the estimated correlation coefficients between the variables is greater than $\sqrt{R^2} = 0.9254$. The Variance Inflation Factor (VIF) was also calculated (Table 6). Although there is no formal criterion, it is usually considered that there is a problem of multicollinearity if the coefficient of determination in the auxiliary regression model () > 0.8, or > 5 (Erjavec & Jakšić, 2016). According to Table 6, there is no problem with multicollinearity because the value of the inflation factor of variation is around 1. A slightly higher value of the inflation variation factor is present in the independent variables *share of small shareholders* and *share of the largest shareholder*, as can be seen from the correlation matrix. Still, this value also does not exceed the fixed limit of five.

Table 6. Variance inflation factors

Variance Inflation Factors Sample: 1 20 Included observations: 20			
	Coefficient	Uncentered	Centered
Variable	Variance	VIF	VIF
C	0.028772	58.55453	NA
BIG_4	0.002965	3.017065	1.508533
LISTINGDAYS	1.19E-10	5.305029	1.191939
OWNSTR	0.036659	8.926444	3.872689
BOARDSIZE	0.000220	4.992428	1.355567
BIGOWN	0.025109	18.02426	4.061478

Source: Authors.

To examine whether the auto-correlation problem exists in the errors, Figure 1 shows the movement of the residuals of the estimated regression model. Since the residuals are around the expected value of zero, it can be concluded that the residuals are stationary, i.e., there is no autocorrelation problem.
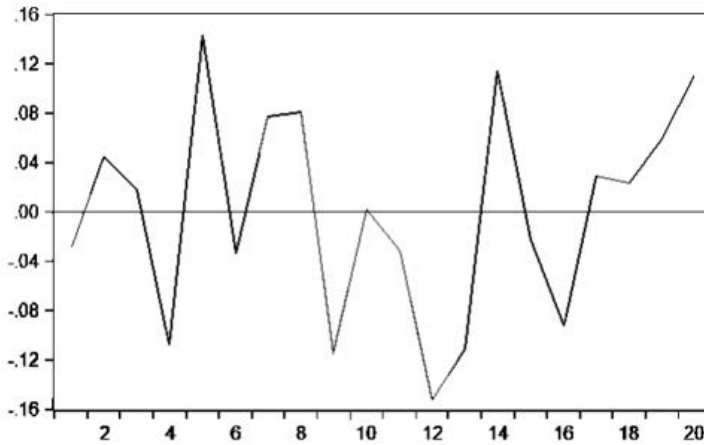
Figure 1. Linear representation of the residuals of the estimated regression model

Source: Authors.

In addition, the existence of the problem of autocorrelation in the errors was also investigated by the Breusch-Godfrey test, including the second order. The test results are presented in Table 7. The test was performed by setting up an auxiliary regression equation in which the residuals are the dependent variable. In contrast, the independent variables of the original model and the residuals with the offset are the independent variables of the new model. To explain the variations in the dependent variable, the significance of the residuals was tested.

Table 7. Breusch-Godfrey serial correlation LM test

F-statistic	0.258658	Prob. F(2,12)		0.7763
Obs*R-squared	0.826562	Prob. Chi-Square(2)		0.6615
Test Equation: Dependent Variable: RESID Method: Least Squares Sample: 1 20 Included observations: 20 Presample missing value lagged residuals set to zero.				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.020489	0.184619	-0.110979	0.9135
BIG_4	0.011552	0.059854	0.193000	0.8502
LISTINGDAYS	-1.52E-06	1.18E-05	-0.128993	0.8995
OWNSTR	0.022768	0.206655	0.110173	0.9141
BOARDSIZE	-0.002055	0.016298	-0.126110	0.9017
BIGOWN	0.034972	0.177907	0.196577	0.8474

RESID(-1)	-0.162623	0.316875	-0.513209	0.6171
RESID(-2)	-0.203479	0.338816	-0.600559	0.5593
R-squared	0.041328	Mean dependent var		6.11E-17
Adjusted R-squared	-0.517897	S.D. dependent var		0.085096
SE of regression	0.104841	Akaike info criterion		-1.383570
Sum squared resid	0.131899	Schwarz criterion		-0.985277
Log-likelihood	21.83570	Hannan-Quinn criterion		-1.305819
F-statistic	0.073902	Durbin-Watson stat		1.787743
Prob(F-statistic)	0.998958			

Source: Authors.

Given that the p-value is equal to 0.6615, which is greater than 0.05, it can be concluded that the null hypothesis cannot be rejected at a significance level of 5%, which means that there is no problem autocorrelation in the errors, including the second order. Finally, the problem of heteroskedasticity was tested using the Breusch-Pagan-Godfrey test. The results are shown in Table 8.

Table 8. Heteroskedasticity test: Breusch-Pagan-Godfrey

F-statistic	6.518942	Prob. F(5,14)		0.0025
Obs*R-squared	13.99073	Prob. Chi-Square(5)		0.0157
Scaled explained SS	3.494348	Prob. Chi-Square(5)		0.6242
Test Equation: Dependent Variable: RESID^2 Method: Least Squares Sample: 1 20 Included observations: 20				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.006931	0.007786	0.890173	0.3884
BIG_4	-0.005737	0.002500	-2.295343	0.0377
LISTINGDAYS	8.36E-08	5.01E-07	0.166866	0.8699
OWNSTR	-0.003445	0.008789	-0.391935	0.7010
BOARDSIZE	-0.000847	0.000681	-1.243689	0.2340
BIGOWN	0.011062	0.007274	1.520767	0.1506
R-squared	0.699537	Mean dependent var		0.006879
Adjusted R-squared	0.592228	S.D. dependent var		0.007126
SE of regression	0.004551	Akaike info criterion		-7.703786
Sum squared resid	0.000290	Schwarz criterion		-7.405066
Log-likelihood	83.03786	Hannan-Quinn criterion		-7.645473
F-statistic	6.518942	Durbin-Watson stat		1.706040
Prob(F-statistic)	0.002493			

Source: Authors.

The null hypothesis cannot be rejected because the p-value is greater than 0.05 according to the Breusch-Pagan-Godfrey test conducted, i.e., it can be concluded that there is no problem of heteroskedasticity.

Since all the initial assumptions of the model are confirmed, it can be concluded that the model is well established. Therefore, it is concluded that *audit firms belonging to the Big 4 group*, the *ownership structure*, and the board size significantly impact the amount and quality of additional information disclosed in financial and non-financial reports. These results confirm the conclusions of most previous studies, which have also shown that the type of auditor has a statistically significant effect on the amount of disclosure, i.e., financial reports audited by the Big 4 auditors contain more relevant information (Chow and Wong-Boren, 1987 in Whiting & Woodcock, 2011, DeAngelo, 1981; Ağca & Önder, 2007; Whiting and Woodcock, 2011; Akhtaruddin and Haron, 2010; Bilić, 2016). Regarding ownership structure, on which different results have been previously reported, this study confirms the conclusions of Haniffa and Cooke (2002) and Barako et al. (2006) but contrasts with those of Hossain et al. (1994) and Allegrini and Greco (2013). Finally, a positive effect of board size confirms the findings of Allegrini and Greco (2013) and Rouf (2011).

On the other hand, the number of *trading days* since the last change in the stock position undermines the willingness to provide additional disclosures in the reports, but this effect is not statistically significant. The authors confirmed their assumption that newly listed companies pay more attention to reporting, although this variable does not have a statistically significant effect.

6. DISCUSSION AND CONCLUSION

Non-financial reporting has become an indispensable part of communication between a company and its stakeholders. Since 2017, all large companies have been required by EU legislation to report non-financial information. This supplements financial information and completes the overall picture of the company's business activities. It is also essential for interested users, especially investors, that the information published is relevant, timely, and truthful.

A study conducted on a sample of companies operating in the real economy sector and listed on the ZSE showed that most companies pay close attention to financial and non-financial information when preparing reports that communicate with stakeholders. Nonetheless, there is still room for improvement in transparent reporting.

After content analysis of the published reports, a multiple linear regression model was established, based on which the set hypotheses were tested. The least-squares method was used to answer the set hypotheses. The analysis showed a statistically significant positive relationship between the amount and quality of information disclosed and the type of auditor, ownership structure, and size of the Board of Directors. A negative relationship was found between the amount of information published and the listing days since the last market change, but it was not statistically significant. Accordingly, hypotheses H1, H3, and H4 were confirmed at the 5% significance level, while hypothesis H2 was not statistically significant at the same significance level.

This study suggests that the majority of the observed companies transparently disclose financial and non-financial information about their business operations. Still, there is certainly room for improvement in reporting practices. A limitation of this study may be the subjective approach of the researchers and the small number of companies in the sample. However, since 85 non-financial companies are listed on the ZSE, 23.53% of listed non-financial companies were included in the sample, which can be considered a representative sample. Research could be extended in the future by including more listed companies or even companies of different sizes. However, certain independent variables would then need to be omitted, and new independent variables could be added to observe their impact on the amount and quality of disclosed information. Additional studies could reduce the subjective approach and make content analysis results more objective.

REFERENCES

1. *Accounting Act* (n.d.). Official Gazette, No. 78/15, 134/15, 120/16, 116/18, 42/20, 47/20.

2. Ağca, A., & Önder, Ş. (2007). Voluntary Disclosure In Turkey: A Study On Firms Listed In Istanbul Stock Exchange (ISE). *Problems and Perspectives in Management, 5*(3), 241–251.

3. Akhtaruddin, M., & Haron, H. (2010). Board ownership, audit committees' effectiveness and voluntary corporate disclosures. *Asian Review of Accounting, 18*(1), 68–82. https://doi.org/10.1108/13217341011046015

4. Aljinović Barać, Ž., & Granić, M. (2015). Dragovoljno izvještavanje u godišnjem izvješću – praksa hrvatskih menadžera. *Ekonomska misao i praksa, 1*, 173–198.

5. Aljinović Barać, Ž., Granić, M., & Vuko, T. (2014). The Determinants of Voluntary Disclosure in Croatia. *International Journal of Social, Human Science and Engineering, 8*(4), 1001–1007. https://www.bib.irb.hr/700878?rad=700878

6. Allegrini, M., & Greco, G. (2013). Corporate boards, audit committees and voluntary disclosure: evidence from Italian Listed Companies. *Journal of Management and Governance, 17*(1), 187–216. https://doi.org/10.1007/s10997-011-9168-3

7. Barako, D. G., Hancock, P., & Izan, H. Y. (2006). Factors Influencing Voluntary Corporate Disclosure by Kenyan Companies. *Corporate Governance: An International Review, 14*(2), 107–125. https://doi.org/10.1111/J.1467-8683.2006.00491.X

8. Bartulović, M., & Pervan, I. (2014). Determinants of voluntary Internet Financial Reporting: analysis for selected CEE countries. *International Journal of Economics and Statistics, 2*, 32–39. https://www.naun.org/main/NAUN/economics/2014/a102015-129.pdf

9. Bilić, M. (2016). Utjecaj vrste revizora i područja djelatnosti na dobrovoljno izvještavanje u Hrvatskoj. *Ekonomska Misao i Praksa, 2*, 469–493.

10. Botosan, C. A. (1997). Disclosure Level and the Cost of Equity Capital. *The Accounting Review, 72*(3), 323–349.

11. Brozović, M., Mamić Sačer, I., Pavić, I., Sever Mališ, S., Tušek, B., & Žager, L. (2020). *Revizija - nadzorni mehanizam korporativnog upravljanja.*

Zagreb: Hrvatska zajednica računovođa i financijskih djelatnika.

12. Bukh, P. N., Nielsen, C., Gormsen, P., & Mouritsen, J. (2005). Disclosure of information on intellectual capital in Danish IPO prospectuses. *Accounting, Auditing & Accountability Journal, 18*(6), 713–732. https://doi.org/10.1108/09513570510627685

13. Corporate Reporting Dialogue (2019). *The Sustainable Development Goals and the future of corporate reporting*. (n.d.). Retrieved 6 November, 2021, from https://www.integratedreporting.org/wp-content/uploads/2019/02/The-Sustainable-Development-Goals-and-the-future-of-corporate-reporting-1.pdf

14. DeAngelo, L. E. (1981). Auditor size and audit quality. *Journal of Accounting and Economics, 3*(3), 183–199. https://doi.org/10.1016/0165-4101(81)90002-1

15. *Directive 2014/95/EU of the European Parliament and of the Council of 22 October 2014 amending Directive 2013/34/EU as regards disclosure of non-financial and diversity information by certain large undertakings and groups*. (2014). Retrieved 6 November, 2021, from https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32014L0095

16. Erjavec, N., & Jakšić, S. (2016). Model višestruke linearne regresije . In V. Bahovec & N. Erjavec (Eds.), *Statistika* (2., pp. 474–530). Zagreb: Element d.o.o.

17. GRI (n.d.). *GRI - Standards*. Retrieved 6 November, 2021, from https://www.globalreporting.org/standards/

18. Haniffa, R. M., & Cooke, T. E. (2002). Culture, Corporate Governance and Disclosure in Malaysian Corporations.

Abacus, 38(3), 317–349. https://doi.org/10.1111/1467-6281.00112

19. Hossain, M., Ahmed, K., & Godfrey, J. M. (2005). Investment opportunity set and voluntary disclosure of prospective information: A simultaneous equations approach. *Journal of Business Finance and Accounting, 32*(5–6), 871–907. https://doi.org/10.1111/J.0306-686X.2005.00616.X

20. Hossain, M., Perera, M. H. B., & Rahman, A. R. (1995). Voluntary Disclosure in the Annual Reports of New Zealand Companies. *Journal of International Financial Management & Accounting, 6*(1), 69–87. https://doi.org/10.1111/J.1467-646X.1995.TB00050.X

21. Hossain, M., Tan, L. M., & Adams, M. (1994). Voluntary Disclosure in an Emerging Capital Market: Some Empirical Evidence from Companies Listed on the Kuala Lumpur Stock Exchange. *The International Journal of Accounting : TIJA, 29*(4), 334–351.

22. HR PSOR (2020). *Hrvatski poslovni savjet za održivi razvoj*. Retrived October 28, 2020, from https://www.hrpsor.hr/

23. International Integrated Reporting Council & Technology Initiative (2018). *Technology primer for integrated reporting - A Chief Information Officer guide*. Retrieved 6 November, 2021, from https://www.integratedreporting.org/wp-content/uploads/2018/06/Tech-Primer-for-Integrated-Reporting.pdf

24. ISO (n.d.). *ISO 26000 — Social responsibility*. Retrieved 6 November, 2021, from https://www.iso.org/iso-26000-social-responsibility.html

25. KPMG (2015). *Currents of change: The KPMG Survey of Corporate*

Responsibility Reporting 2015. www.kpmg.com/crreporting

26. KPMG (2017). *The KPMG Survey of Corporate Responsibility Reporting 2017*. www.kpmg.com/crreporting

27. McKinnon, J. L., & Dalimunthe, L. (1993). Voluntary disclosure of segment information by Australian diversified companies. *Accounting & Finance, 33*(1), 33–50. https://doi.org/10.1111/J.1467-629X.1993.TB00192.X

28. OECD (2018). *OECD Due Diligence Guidance for Responsible Business Conduct*. (n.d.). Retrieved 6 November, 2021, from https://www.oecd.org/investment/due-diligence-guidance-for-responsible-business-conduct.htm

29. OECD (2011). *OECD Guidelines for Multinational Enterprises*. Retrieved 6 November, 2021, from http://mneguidelines.oecd.org/guidelines/

30. Pervan, I. (2006). Dobrovoljno financijsko izvješćivanje na Internetu: analiza prakse hrvatskih i slovenskih dioničkih društava koja kotiraju na burzama. *Financijska Teorija i Praksa, 30*(1), 1–27.

31. Rogošić, A., Grubišić, D., & Bilić, I. (2010). Voluntary disclosure of accounting and management information ISO 9001 certified companies. *Poslovna Izvrsnost, 4*(2), 25–35.

32. Rouf, A. (2011). Corporate characteristics, governance attributes and the extent of voluntary disclosure in Bangladesh. *African Journal of Business Management, 5*(19), 7836–7845. https://doi.org/10.5897/AJBM10.1180

33. Sever Mališ, S., & Brozović, M. (2017). The auditor's assessment of going concern as an integral part of a financial statement audit. In I. Ekanem (Ed.), *Understanding Bankruptcy*

- Global Issues, Perspectives and Challenges (pp. 125–150). Nova Science Publishers New York.

34. Sever Mališ, S., & Brozović, M. (2016). Audit Firm Tenure and Audit Quality: Case of Listed Companies in Croatia. *8th International Conference An Enterprise Odyssey: Saving the Sinking Ship Through Human Capital*, 628–637.

35. United Nations Global Compact (2018a). *Integrating the Sustainable Development Goals into Corporate Reporting: A Practical Guide*. (n.d.). Retrieved 6 November, 2021, from https://www.unglobalcompact.org/library/5628

36. United Nations Global Compact (2018b). *In Focus: Addressing Investor Needs in Business Reporting on the SDGs*. (n.d.). Retrieved 6 November, 2021, from https://www.unglobalcompact.org/library/5625

37. United Nations Global Compact (2017). *Blueprint for Business Leadership on the SDGs*. (n.d.). Retrieved 6 November, 2021, from https://www.unglobalcompact.org/library/5461

38. United Nations Global Compact (2011). *A Global Compact for Sustainable Energy: A Framework for Business Action*. (n.d.). Retrieved 6 November, 2021, from https://www.unglobalcompact.org/library/140

39. Value Reporting Foundation (2021). *International IR Framework*. Retrieved 6 November, 2021, from https://www.integratedreporting.org/resource/international-ir-framework/

40. Value Reporting Foundation (n.d.). *The Sustainable Development Goals, integrated thinking and the integrated report*. (n.d.). Retrieved 6 November,

2021, from https://www.integrate-dreporting.org/resource/sdgs-integrated-thinking-and-the-integrated-report/

41. Whiting, R. H., & Woodcock, J. (2011). Firm characteristics and intellectual capital disclosure by Australian companies. *Journal of Human Resource Costing & Accounting, 15*(2), 102–126. https://doi.org/10.1108/14013381111157337

42. Zagreb Stock Exchange (2020). Retrieved 23 August, 2020, from https://zse.hr

43. Žager, L., Mališ, S. S., & Brozović, M. (2016). Inspection Results on the Quality of Auditing. *Entrepreneurship, Business and Economics, 2*, 59–79. https://doi.org/10.1007/978-3-319-27573-4_4

ČIMBENICI UTJECAJA NA OTKRIVANJE DODATNIH FINANCIJSKIH I NEFINANCIJSKIH INFORMACIJA VELIKIH PODUZEĆA

Sažetak

Dionici poduzeća danas, u mnogo većoj mjeri nego ranije, uz financijske informacije, zahtijevaju otkrivanje dodatnih informacija, kao dio korporacijskog izvještavanja. Ovu potrebu prepoznaju i regulatori, koji su počeli donositi zakone, kojima se od velikih poduzeća, uz financijske, zahtijeva i iskazivanje minimalnih dodatnih informacija. U ovom se radu istražuju neke od mogućih obilježja velikih poduzeća, koja bi mogla utjecati na opseg otkrivanja dodatnih informacija, a što se posebno odnosi na njihov značaj i važnost. Istraživanje je provedeno na uzorku od dvadeset poduzeća iz realnog (nefinancijskog) sektora, uključenih u kotaciju Zagrebačke burze, a što čini 23,53% navedene populacije. Inicijalno je, za analizu izvješća ovih poduzeća, korištena metoda analize sadržaja. Nadalje, za procjenu specifičnih obilježja poduzeća, korištena je i metoda multiple linearne regresije. Rezultati istraživanja pokazuju da vrsta revizora, vlasnička struktura i veličina nadzornog odbora imaju statistički značajan pozitivan utjecaj na kvalitetu objavljenih financijskih i nefinancijskih informacija. Nasuprot tome, broj dana u kojima je poduzeće uključeno u kotaciju na burzi ima negativan, ali statistički nesignifikantan utjecaj (promatrano na razini signifikantnosti od 5%). Naposljetku, iako se ukupni rezultati, koji se odnose na kvalitetu izvještavanja, mogu ocijeniti kao zadovoljavajući, postoji prostor za njegovo daljnje unapređenje, s obzirom na transparentnost financijskog i nefinancijskog izvještavanja.

Ključne riječi: *europska regulacija, Direktiva o nefinancijskom izvještavanju, otkrivanje financijskih i nefinancijskih podataka, informacije i kvaliteta izvještavanja, Hrvatska*

APPENDIX A: List of items that make up the disclosure index (DI)

STRATEGIC INFORMATION	
General information about the company	
1	A brief history of the company
2	Description of the main activity
3	Defined corporate goals
4	Defined corporate strategy
5	Organizational structure
6	Ownership structure
7	Strategic business areas
8	Overview of the largest shareholders
9	Market share (total or by segments)
Research and development information	
10	Description of research and development projects
11	The value of research and development projects
12	Investments
Estimates of future trends	
13	Description of future business developments with regard to the market situation (e.g., estimate of achievement of set targets)
14	Quantitative assessment of future sales / earnings / cash flows
15	Qualitative assessment of future sales / earnings / cash flows
16	Estimation of market share trends
17	Comparison with key competitors
NON-FINANCIAL INFORMATION	
Employee information	
18	Number of employees
19	Employee structure by gender
20	Employee structure by age
21	Employee structure by education
22	Employee reward program
23	Employee training policies
24	Number of employees (hours) who have undergone certain trainings
Information on board members	
25	Structure of the board members by areas
26	Information on the professional careers of the board members
27	Ownership share of board members
28	Management remuneration policy

Corporate social responsibility	
29	Environmental protection programs
30	Quantitative impact on environmental protection
31	Community inclusion programs
32	Quantitative impact on the social community
33	Sponsorships, donations, humanitarian actions
34	Safety at work
35	Product safety and quality (safety standards)
Risk information	
36	Business risks
37	Industry risks / market risks
38	Competition risks
39	Financial risks
Other non-financial information	
40	Information technology
41	Information on complaints / grievances
42	List of brands / products
FINANCIAL INFORMATION	
Financial indicators	
43	Liquidity ratios
44	Indebtedness indicators
45	Activity indicators
46	Profitability indicators
47	Investment indicators
48	EBITDA
49	Qualitative analysis of financial indicators
Comparison with the previous period	
50	Dynamics of revenue trends
51	Dynamics of cost / expenditure trends
52	Sales dynamics by segments
Share information	
53	Total number of shares
54	Value of shares at the end of the period
55	Comparison of share price movements over the period
56	Dividend payment policy

Other financial information	
57	Average employee salary
58	Employee training costs
59	Sales by country
60	Sales by categories
61	Intellectual capital
62	Measuring intellectual capital
63	The difference between the market and book value of the company
64	Reasons for the difference between the market and book value of a company