

THE ROLE OF THE NOTES TO THE FINANCIAL STATEMENTS IN CORPORATE DECISION-MAKING

Veronika Fenyves^{*}, Zoltán Bács^{**}, Zoltán Zéman^{***},
Elvira Böcskei^{****}, Tibor Tarnóczy^{**}

^{*} Corresponding author Faculty of Economics and Business, University of Debrecen, Hungary
Contact details: Faculty of Economics and Business, University of Debrecen, Debrecen, 4002 Debrecen Pf. 400, Hungary

^{**} Faculty of Economics and Business, University of Debrecen, Debrecen, Hungary

^{***} Szent István University Faculty of Economics and Social Sciences, Hungary

^{****} Faculty of Economic and Social Sciences, Budapest University of Technology and Economics, Budapest, Hungary



Abstract

How to cite this paper: Fenyves, V., Bács, Z., Zéman, Z., Böcskei, E., & Tarnóczy, T. (2018). The role of the notes to the financial statements in corporate decision-making. *Corporate Ownership & Control*, 15(4-1), 138-148.
<http://doi.org/10.22495/cocv15i4c1p1>

Copyright © 2018 The Authors

This work is licensed under the Creative Commons Attribution-NonCommercial 4.0 International License (CC BY-NC 4.0).
<http://creativecommons.org/licenses/by-nc/4.0/>

ISSN Online: 1810-3057

ISSN Print: 1727-9232

Received: 27.06.2018

Accepted: 17.08.2018

JEL Classification: M40, M14, C81, C00

DOI: 10.22495/cocv15i4c1p1

For the analyses, we used the notes to the financial statements of companies with Hungarian headquarters, which are regulated by the Accounting Act and which have information-technology services as their primary activity of the business. The primary objective of our research was to examine the extent to which the enterprises investigated fulfill their obligations determined by the Accounting Act to disclose all needed information in the general and informative parts of the notes to the financial statement. The analysis was performed using text mining, and the results were evaluated with non-parametric statistical methods. Based on the analysis, we can state that the investigated companies presented proportionally less information in the general part of the notes to the financial statements as compared to the informative part. However, even the highest frequency did not exceed 70%. Based on the χ^2 test, we can state that the frequency of occurrence of the majority of information sought using text mining significantly differs by company type, and this difference mostly occurred amongst Ltds and Lps, in favor of Ltds. As a conclusion, it can be deduced that the investigated companies do fully not meet the legal requirements for the information provided in the notes to the financial statements. This incompleteness may cut down on the decision-making ability of the companies concerned.

Keywords: Value Creation, Information Service, Notes To The Financial Statement, General Part Of Notes, Informative Part Of Notes, Text Mining

Acknowledgements: Research is supported by ÚNKP-17-4, New national excellence program of the Ministry of Human Capacities

1. INTRODUCTION

The primary objective of our study was to examine the extent to which Hungarian enterprises fulfill their obligations stipulated by the Accounting Act to disclose all of the information in the scope of the general and informative parts of the notes to the financial statement (elaborated as a part of the financial statements). They are necessary for the appropriate interpretation of the balance sheet and income statement and for obtaining the proper level of knowledge about the performance of the company. The analysis was carried out with the

involvement of the financial statements of companies, which deal with information-technology services as their primary activity. Besides the general objective, we intend to examine whether the amount of disclosed information depends on the type of the company preparing the financial statements. We would like to answer the following questions to achieve the main research goal:

– Are there significant differences among the information provided in the general part of notes to the financial statements provided by several company types?

– Are there are significant differences among the information provided in the informative part of notes to the financial statements provided by several company types?

– To what extent do the notes to the financial statements published by the IT service companies meet the legal requirements and to what extent they provide additional information?

One of the most important financial objectives of enterprises in our globalized, competitive environment is value creation, namely the constant increase of the wealth of the company, which could also be defined as the determination of the sustainable level of growth. The company is only able to achieve and maintain this sustainable level of growth in close cooperation with its external and internal stakeholders. Another essential question is whether, in the case of profit-oriented companies, sustainability and growth can conflict. According to Lagoarde-Segot and Paraque (2018), corporate financing must be sustainable both regarding its impact on society and investment, which means that social responsibility and the sustainability of social relations are also essential in this regard. For these companies to meet these criteria, it is necessary to renew standards and tools applied by the financial profession. Vlasova et al. (2016) believe that sustainable development has three essential elements: biosphere preservation (ecological sustainability), solid economic growth (economic sustainability) and human development (social sustainability). Nowadays, management processes supporting sustainable development are in close connection with human resources.

Economic sustainability implies a practice that serves long-term economic growth without having a negative impact on the social, environmental and cultural aspects of the community. According to Chelan et al. (2018), economic sustainability means a process of income generation and stability for members of society, which is realized without the erosion of capital and resources. Sustainability involving the entirety of the economy can only be achieved through sustainable corporate management. Sustainability is significantly influenced by the nature of the carried out business activities. People continually seek to achieve higher living standards, which requires the production of more and more goods; this should be achieved by using fewer resources, and by generating less polluting emissions and resulted in waste (Hami et al., 2015). An increasing number of authors have dealt with the problem of the sustainable growth of enterprises lately. Some authors write about prosperity without growth (Fritz and Koch, 2014; Delhey and Steckermeier, 2016). However, debates on the compatibility of the concepts of economic growth and sustainability have also been intensified following the 2008 financial and economic crisis (Martinez-Alier et al., 2010; Kallis, 2011; Van den Bergh, 2011; Tokic, 2012). After the crisis, there was a need to reconsider the compatibility of sustainability and growth and to think about what changes are necessary for corporate systems. There was and still is a need to re-interpret and re-identify the driving forces in business life that can be used in the analysis of sustainable growth in enterprises (Bocken et al., 2014; Yip & Bocken, 2018).

According to the literature, it is clear that sustainable development and corporate growth are not compatible in all of the cases. It is also

important to note that the sustainability of an organization depends on various internal and external stakeholders (Freeman, 2014). This dependency means that there is a need to establish a proper link amongst different enterprises for the sake of sustainability in the various businesses, which means that the companies involved need to have the necessary information concerning each other (Davies & Chambers, 2018). It is only possible in possession of the right knowledge to carry out a so-called sustainable entrepreneur activity (Schaltegger & Wagner, 2011). Entrepreneurs with sustainable entrepreneurial skills can produce economic, social and environmental value in the scope of a holistic approach (Baumgartner, 2010). Corporate sustainability requires an appropriate corporate strategy. It is necessary to define the framework and the principles on which the company will operate in the future to develop a sustainable strategy.

Our study includes four additional parts. In the next part, literature review, we have collected the main literature related to the subject, and we present the other authors' findings on the subject. During the processing of the literature, we tried for the demonstration of why it is essential to have the adequate and sufficient information for the sustainable development of the companies and what is the relevance of the notes to the financial statements to ensure this requirement. In the third part, data and methodology, we present the database and methods used in the research. The fourth part, results and discussion, contains the findings of the research, which describes the extent to which the companies investigated fulfill the requirements of the Accounting Act related to the notes to the financial statements. We also examine whether there is a difference between the different types of enterprises in the extent of information provision. The last chapter contains conclusions drawn from the research results, and we mention the main limitations of the research too.

2. LITERATURE REVIEW

Competitiveness of the company reflects its long-term competitiveness and relationship with other companies. A competitive company must always be aware of the requirements necessary for creating value. The company must have the necessary knowledge concerning how to create sustainable value through a strategy tailored to organizational objectives (Lloret, 2016). Therefore, knowledge is essential to the successful operation of the company, which means that only companies, which are in possession of the necessary information and can quickly convert it into organizational knowledge, can meet economic challenges. In an increasingly competitive environment, companies need to monitor and understand their performance and that of their competitors (Taticchi, 2008; Hudson et al., 2001). Companies may acquire information from multiple sources, one of the most important of which are the financial statements and its various parts.

Decision making increasingly involves uncertainty, misinterpretation, and complexity. Amongst the conditions of market economy, organizational success mostly depends on the ability of management to understand and apply the most recent management principles, methods, and

techniques (Socea, 2012). The achievement of appropriate organizational knowledge requires a reliable and unified information system, which provides data and information towards the enterprise and its environment at the same time. Most of this information demand can be fulfilled by the accounting system of companies, which is regulated in Hungary by the Act C of 2000 on Accounting. According to Łęgowik-Świącik (2015), corporate information systems mostly provide all information, which is necessary for decision-making and the execution of activities. Information systems must help companies for them to respond rapidly to the changes in their environment.

The financial statements must also contain information concerning the performance of companies. Measurement of business performance and its improvement have become vital elements in the lives of businesses (Sharma et al., 2005). The market structure also has a significant influence on the business performance of enterprises, which appears more intensively in the case of a smaller company size (Haltiwanger, 2011). Torugsa et al. (2011) analyzed the relationship between proactive social responsibility and financial performance. They found that if financial performance increases, social responsibility becomes more increased, therefore better financial performance should be facilitated. Gill and Biger (2012) examined the problem of corporate growth in Canada. As a result of the investigation, it has been presented that financing problems, growth barriers, and non-compliance with market challenges are the most significant obstacles regarding competitiveness. Wiersch and Shane (2013), and Peek (2013) pointed out the shortage of capital, solvency problems and loaning difficulties in the United States, which all have significant impacts on corporate competitiveness.

Accounting is a base of the corporate information system that is responsible for providing information to the stakeholders of the company by legal provisions. The Accounting Act stipulates accounting regulations that are in conformity with the policies of the European Union in this regard, that take into consideration international accounting principles and based on which a reliable and realistic image can be provided about the income generating capacity, wealth, wealth changes, financial situation and plans of entities that are regulated by it. For the proper functioning of the market economy, it is essential for market players to possess this information as a support for their decision-making. However, it is to be pointed out that the chance of acquiring the same information is not the same for every stakeholder of a company; an asymmetry regarding information is characteristic.

The Accounting Act defines bookkeeping and reporting obligations of entities to which it applies, rules of bookkeeping, mandatory principles to be enforced during the assembly of their financial statements, and provisions regarding publication, disclosure, and auditing (Böcskei, 2014). These principles guarantee that the prepared statement is reliable for market participants and reflects a realistic image of the wealth, financial and profitability situation, assets and liabilities of the company and their changes (Musinszki, 2016). According to the above, it can be established that the financial statements are an essential source of information in business relations between companies. However, it should be noted that due to

their aggregate nature, the necessary information and through that the necessary knowledge can only be obtained from the two fundamental parts of the financial statements if the third part of the statements contains the information that contributes to the more comprehensive interpretation of the other two parts of the financial statements. The utilization of notes the financial statements that do not have adequate information might hinder the effective utilization of the balance sheet and income statement. Data included by the balance sheet, income statement and cash-flow statement must be completed with textual explanations, information not only according to the stipulations of the Hungarian Accounting Act but the provisions of IFRS as well. IFRS specifies that principles of elaborating financial reports and the applied accounting policy have to be presented in the scope of the notes, and additional information provisioned by IFRS, which are not included in the financial reports must be published as well. The notes must also include other relevant information, which is not introduced in any other parts of the financial reports but is relevant regarding understanding their data (Lakatos et al., 2018).

In Hungary, Act C of 2000 on Accounting (the Accounting Act) prescribes that business entities shall prepare a statement on their operation, wealth, financial, and profitability situation following the end of the financial year. The form of the financial statements may be different depending on the size of the given business. The size difference amongst enterprises is expressed based on the balance sheet total, annual net revenue and the average number of employees during the business year. From among the different statement types, the annual statement, the consolidated annual statement and the annual financial statements in simplified form contain notes to the financial statement (Fridrich & Simon, 2018).

Act C of 2000 on Accounting prescribes that the notes to the financial statement shall include the numerical data and textual information that:

- are provisioned by the Accounting Act,
- are required, beyond the information included by the balance sheet and income statement, for the reliable and realistic picture of the wealth and financial situation of the enterprise, and its operating profit.

The Accounting Act contains information that shall be included in notes to the financial statement, but it does not arrange them into groups. Information related to specific parts regarding the data content of the notes to the financial statement is only loosely listed. As for the structure of the notes to the financial statements, the Accounting Act only prescribes that the order of presentation must follow the structure of the balance sheet and the income statement (Fridrich & Simon, 2018). However, in the case of the financial statements, it is advisable to divide this information into three major parts for practical reasons. Accordingly, the following distinction can be made:

- a general part that is intended to provide a better understanding of the information contained in the report,
- a specific part, in which the information relates to the numerical data included in the balance sheet and the profit and loss account and presents their details and explanations,

– finally, an informative part, which can be linked to the actual operation of the business and which facilitates a detailed understanding of the situation of the company; it is only indirectly related to the balance sheet and profit and loss account (Kántor, 2016) which belong to the financial statements.

Amongst the information presented in the general part of the notes to the financial statements key elements of the accounting policy, their changes and their impact on the profits shall be included. These information requirements mean the description of the primary rules of accounting policy as well as the rules that are required for the understanding of the data presented in the financial statements (Fridrich & Simon, 2018).

In the informative part of the notes to the financial statements, some legally provisioned contextual components are included that serve to provide a more detailed description and characterization of the situation of the company; it is indirectly linked to the balance sheet and/or income statement (Kántor, 2016), which belong to the financial statements.

In his study, Kántor (2016) discusses that there are still businesses which introduce specific values of the balance sheet and income statement inadequately (if they do at all) in the notes to the financial statements. They are afraid that their competitors might find out certain facts and information about their activities and efforts, which might put the company in a disadvantageous position. However, according to the effective legal provisions, preparation of the notes to the financial statements – aside from specific components – is compulsory; its content regarding data and information is regulated. Therefore, sufficient time and energy should be dedicated to its elaboration and the publication of relevant information by both the management and the expert(s) carrying out bookkeeping tasks. It is also to be pointed out that decision-making based on inadequate knowledge further increases economic risks that are already high. However, financial statements should help reduce risks through more established decision-making. In our research, we introduce – through the analysis of a sector – the extent to which whether the notes to the financial statements include the information, which is essential for the appropriate interpretation of the balance sheet.

In economically developed countries, the scale of information published by companies is increasing, and they provide much more information about themselves than before. In the scope of this increasing amount of data, companies – beyond financial information – introduce the main features of their corporate strategy, their opportunities, risks, and abilities (Matthies, 2015). The tasks of the corporate disclosure include the management of relations with stakeholders and the assurance of the legitimacy of the company within society (Aureli, 2017).

The applicability of financial statements is critical for the effective communication to financial information to users' group that they can to make the right economic decisions. The companies should provide clear and useful information in the course of disclosure of the financial reports, and in particular in the case of the notes to the financial statements to achieve the above objective, Processing of the notes to the financial statements is mostly not a

simple task due to their inadequate "readability" (Cheung & Lau, 2016).

The rapid development of information technology increasingly allows various corporate information to be easily accessible for stakeholders. XBRL (eXtensible Business Reporting Language) has created the opportunity to rapidly obtain financial information in a standardized form (Tamidi & Roni, 2014). XBRL is a search-supporting software methodology, which improves the processibility of financial statements and enables the reuse of data, the accessibility, operability, and efficiency, thus reduce the time and costs of financial reporting. Also, XBRL can also reduce information asymmetries (Panizzolo et al., 2017). XBRL stores information in a format, which is legible for computers, enabling data to be processed and analyzed (Debreceeny et al., 2005). The XBRL does not only mean a new technology but depending on the reliability and integrity of the taxonomy, valuable software tool to improve the quality of financial statements. Thus, the financial information is filtered out not only by the accounting principles but also the dictionary used in their digital encoding (Fradeani et al., 2016). XBRL technology can provide the standardization of the financial data because there are assigned predefined elements and labels to the financial information. If the technology is used adequately, the information standardization can improve the processing of the financial statements (Henderson et al., 2015). XBRL is an evolving technology, what is used in more than 50 countries, and subsidized by the international XBRL consortium, which includes more than 600 member organizations. Even so, its adoption is not uniform. There are countries where the XBRL is used only for the balance sheet and the income statement, while there are countries where it is used in case of the notes to the financial statements as well (Avallone et al., 2016). Currently, XBRL technology is not used in Hungary. However, its use could considerably assist in the using of financial reports by the companies concerned and would also provide support for such research.

3. DATA AND METHODOLOGY

In Hungary, up to the financial reports prepared for 2014, the notes to the financial statements had to be uploaded in pdf format. Processing of these notes to the financial statements was problematic because the pdf file was created in an image format in case of some companies. Accordingly, we used pdf files in our analysis. The notes to the financial statements have to be made in an interactive form since the financial reports prepared for 2016, and the application was prepared with HTML language. This new development will likely facilitate the analysis of the notes to the financial statements. A better solution would be to introduce the XBRL methodology, what is still not work in Hungary.

For the analyses, we used the notes to the financial statements of companies with Hungarian headquarters, which are regulated by the Accounting Act and which have information-technology services as their primary activity of the business. In conformity with the above, the database included 11,476 companies, 8,858 of which had notes to the financial statement (the rest of the organizations either did not prepare notes to the financial statement or were obliged to prepare a statement of micro-enterprises, where notes on the financial

statements are not relevant). We managed to process the notes to the financial statements of 8,226 (92.87%) of the above companies, the format of the rest of the companies did not make it possible for us. The analyses were performed using various packages of the R statistical system.

Table 1 represents the distribution of processed notes to the financial statements by the type of company and financial statements. According to the table, most of the enterprises operating within the sector are Ltds (70.86%), and the majority of the companies prepared financial statements in simplified form (78.19%). The type of the statements was not indicated in the notes to the

financial statements of 12.84% of the analyzed enterprises, while 2.37% did not provide information about their company type. There were 45 companies (0.55%), which did not indicate either their company type or the type of the financial statements. These deficiencies draw attention to the fact that there are companies that do not pay enough attention even to indicate the most fundamental data. According to professional literature, the scale of information published by companies in developed countries is increasing; however, a significant proportion of the companies within the analyzed sector does not even comply entirely with legal provisions.

Table 1. Distribution of the processed notes to the financial statements by business type and type of financial statements

Business type	Type of financial statements							
	Not specifies		Annual financial statements in the simplified form		Annual financial statement		Total	
	pcs.	%	pcs.	%	pcs.	%	pcs.	%
Not specified	45	0.55	128	1.56	22	0.27	195	2.37
Lp.	271	3.29	1696	20.62	173	2.10	2140	26.02
Ltd.	736	8.95	4563	55.47	530	6.44	5829	70.86
Plc.	4	0.05	45	0.55	13	0.16	62	0.75
Total	1056	12.84	6432	78.19	738	8.97	8226	100.00

Source: own calculation.

The notes to the financial statements contain quantitative and qualitative free-format information connected with financial statements, what should allow of a more understanding of a company's real financial performance. Moreover, there are no exact directions for the clarity or conciseness of the descriptions used in notes to the financial statements (Chakraborty & Vasarhelyi, 2017). That was the reason why we had to look for a method that allows analysis of non-standard texts. The method chosen was the text mining. Using text mining, we analyzed the extent to which the notes to the financial statements provide the necessary information that would be indispensable for the proper interpretation of the balance sheet and income statement.

Over the past two decades, text mining has gained more and more interest in both academic areas and business intelligence applications. Text mining means the ability to acquire useful and novel knowledge, which could help process a large amount of mass data through processing large amounts of unstructured text. There is another definition, according to which, text mining is a processing procedure in the course of which a suitable insight into the text can be obtained (Kwartler, 2017). More and more text-like databases are created in computer-readable formats that require rapid processing. Text mining is an interdisciplinary research field that utilizes various tools of computer science, linguistics, and statistics (Feinerer, 2008).

Aureli (2017) used the text mining and the content analysis methods in case of four companies to determine the extent to which they use the term "sustainability". She makes some difference between text mining and content analysis but writes that the difference is not significant, and content analysis means a broader investigation. We think that text mining can be used more in our case because it focuses on terms. Using content analysis is more

advantageous if complex research concepts are to be investigated in the research.

For the use of text mining, we have defined the basic expressions occurred in notes to the financial statements and their possible synonyms. We ignored the suffixes during the elaboration.

Every quantitative research, such as business science, uses statistical methods, which require the gathering of structured information (Munzert et al., 2014). The 'tm' software package of the R statistical system provides an infrastructure that allows users to work efficiently with texts, the related metadata, and to transform texts into structured representations where the necessary statistical methods can finally be applied (Feinerer et al., 2008). The 'tm' package also allows users to process texts of different formats (txt, doc, pdf, csv, etc.). Analysis of the texts intended for examination requires the execution of tasks that may influence the accuracy, validity, and findings of the text analysis procedure, as well as the techniques used for the analysis (Welbers et al., 2017).

We created two-way contingency tables for all of the company types and expressions to analyze the results obtained in text mining, and chi-square test tested the relationships between them. We used Pearson chi-square test what is suitable to compare the observed counts to estimated expected counts from any hypothesized model. The Pearson test is usually used to perform a hypothesis test on contingency table data. With Pearson's chi-square test, we analyzed whether there is a general difference in the frequency of expressions occurrence considering different company types (Bilder & Loughin, 2015).

To compare the company types individually, we used the pairwise t-test, which also makes it possible to decide what kind of companies put up a higher frequency of the information provided (Heumann et al., 2016).

4. RESULTS AND DISCUSSION

In our research, the appearance of the information belonging to the general and informative parts within the notes to the financial statements is investigated in the case of companies, which proceed to the information technology services as a primary activity. In the course of the research, using text mining, we examined whether partially compulsory or expectable terms appear within the general and informative parts of the notes to the financial statements of the sector investigated. We chose text mining as a research method because the notes to the financial statements were available in pdf format and therefore it seemed the best solution. We also analyzed whether the occurrences of the information included by the notes to the financial statements significantly differ by company type.

4.1. Comprehensive analysis of the general part of the notes to the financial statements

The Hungarian Accounting Act does not compulsorily prescribe for business entities to include a "General part" in their notes to the financial statements. However, it requires companies to provide information that serves the more comprehensive understanding of the data presented in the financial statements. We examined how many business entities have included the term "general part" in their notes to the financial statements. Only 33.05% of the analyzed sample, 2,719 notes to the financial statements included a separate general part what is not fundamentally a problem since such a section is not a mandatory element of the notes to the financial statements. However, it is stipulated by the Accounting Act that the following data are presented:

- The name of the enterprise, the exact address and contact information of its headquarters and website if the enterprise publishes its financial statements and the related business reports online as well. 5,926 of 8,226 organizations indicated their exact company headquarters address, which is 72% of the sample. The name of the website was included in 298 notes to the financial statements, but there is no information about the enterprises, which publish their annual statements through their website as well.

- Determinant components of the accounting policy and their changes, the effect of these changes on financial results. The term accounting policy appeared in the notes to the financial statements of 5,848 business entities, which is 71% of the involved enterprises.

- It is compulsory for the entrepreneur to introduce the system of rules applied for the elaboration of the financial statements, its major properties, the applied valuation procedures and method and frequency of depreciation determined in the scope of the accounting policy.

- Valuation procedures appeared in 2,328 notes to the financial statements, which represents a 28% share.

- The method of depreciation was introduced by the business entities in 40% of the notes, and only 6% declared the frequency of accounting depreciation at the company.

- 1,667 companies in their notes included information related to the executive officers of the financial statements, which is 20.27% of the sample.

- 477 companies in their notes included information related to the board of directors to the financial statement, which is 5.5% of the sample.

- Information related to the board of supervisors were included in 10.64% of the sample (875 pcs.).

The results related to the general part of the notes to the financial statement were examined based on business type. The results of the examination are shown in Figure A.1.

The column graphs in Figure A.1 indicate the proportion of occurrence of information related to the general part of the notes to the financial statements, by business type. The figure also shows that three entries have reached an occurrence of above 60%, and it is also observable that there is a high level of incidence in the case of all three business types. These items are the auditor's allowance and chamber identification number. The allowance of the auditor was the highest in the case of public limited companies, and chamber identification number appeared most frequently in the case of Ltds (60%). As for the rest of the entries, an occurrence rate of 40% is the most characteristic. The law stipulates that the statutory auditor-related obligation shall be indicated in the notes to the financial statements; we found this in less than 40% of the notes to the financial statements in the case of all three business types. According to the above, it can be stated that companies that presented the fee charged by the auditor did not indicate that they are legally obliged to perform an audit.

It may also happen that companies utilize the auditor services that are not legally required for them to do, but practice shows that the proportion of such companies is not very high. Most of the companies did not include the method of depreciation in the notes to the financial statements, but some of them presented its frequency. There is a low occurrence regarding the board of directors, the supervisory board and the executive officers, the name of the headquarters and the website information. However, there are certain entries with low incidence, which are not mentioned more frequently, because they are not relevant in the case of particular companies. In the figure, the continuous line in the section of column graphs indicates the average incidence of given characteristics within the total sample.

Information related to executive officers, the board of directors and the supervisory board were analyzed by company type as well. 73.19% of the 1,667 companies providing information on the executive officers were limited companies, 76.31% of the 477 companies that included information on the board of directors were also limited liability companies, 71.43% of the 875 companies providing information on the supervisory board it were Ltds as well.

4.2. Differences among the information in the general part of the notes by company type

Comparison of the frequencies of terms obtained using text mining by company type was tested using χ^2 -test and t-test, the results of which are shown in

Table 2 concerning the general part of the notes to the financial statements. Null hypothesis (H_0) of the χ^2 test was that the term frequencies in the general part of the notes to the financial statements are independent of the company type that is no relationship between the company type and the occurrences of particular items in the notes to the financial statements. The alternative hypothesis of the test (H_1) is the reverse of the previous one. Pearson's χ^2 test was applied to perform the test. It can be seen in Table 2 that in the case of four characteristics (items 1-2, 8, 10) independence can be established, namely the frequency of occurrence of these items is independent of the company type. In the case of the rest of the items, at the significance level of at least 10%, the frequency of occurrence depends on the company type. Frequencies of occurrence by company type are shown in Figure A.1; it represents that the most important items of the general part have a high frequency of incidence, namely companies focus on these items during publication.

The last three columns of Table 2 show the results of a test in the course of which we analyzed – using applying pairwise t-test – which company types are different regarding the frequency of publications and we indicated where (in the case of which type of enterprise) the higher values were found. According to the table, it is clear that the results of the χ^2 -test and t-test are synchronous with each other. It can be established that there are significant differences in the case of 12 factors with one exception (chamber identification number) and that deviation is significant on a level of at least 5% between Ltds and the Lps, for the benefit of Ltds, where the respective level of significance can be found in the χ^2 test.

There was a significant difference between Plcs and Lps in 6 cases; 2 of these is only significant at the level of 10%; 3-3 are significant in favor of Lps and Plcs respectively. As for the analysis of Plcs and Ltds, in three out of four cases the significant difference was recorded in favor of Ltds.

Table 2. Results of statistical tests related to the distribution of information belonging to the general part of the notes to the financial statement, shown by business type

No.	Searched term	χ^2 test	t-test		
			Ltd-Lp	Plc-Lp	Plc-Ltd
1	Evaluation procedures				
2	Depreciation calculation				
3	Frequency of depreciation calculation	***	***(+)	·(+)	
4	Significant amount of error	*	**(+)		
5	Obligated for auditing	***	***(+)	**(-)	
6.	Executive officers	*	**(+)	·(-)	
7	Board of directors	**	***(+)		
8	Supervisory board				
9	Allowance for the executive officers	·	·(-)		
10	Allowance for the members of the supervisory board				
11	Headquarters	*	*(+)		
12	Website	·	*(+)		
13	Accounting policy	***	***(+)	*(+)	
14	Chamber identification number	**	·(+)		**(-)
15	Auditor's allowance	***	***(+)	*(+)	*(+)
16	Person responsible for bookkeeping services	**	*(+)	*(-)	***(-)

Source: own calculation. Significance levels: *** - 0.1%, ** - 1%, * - 5%, · - 10%.

(+) upon calculation of difference, the value of the 1st item is higher.

(-) upon calculation of difference, the value of the 2nd item is higher.

4.3. Comprehensive analysis of the informative part of the notes to the financial statements

As mentioned above, the Hungarian Accounting Act does not compulsorily prescribe for business entities to include an "Informative part" in their notes to the financial statements. However, it requires companies to provide information that is linked to the operation of the company and facilitate the more comprehensive understanding of its situation. We examined how many business entities have included the term "informative part" in their notes to the financial statements. 68.13% of the analyzed sample did not include, and 31.87% (2,719 pcs.) included a separate informative part in their notes to the financial statements. Lack of informative part is not fundamentally a problem, since – as mentioned above – this part is not a mandatory element of the notes to the financial statement. According to the stipulations of the Accounting Act, the following are provisioned:

– Information related to the number of employees. Of the analyzed 8,226 business entities, 1,503 organizations indicated their number of employees (31.87% of the sample, where the proportion of businesses preparing annual financial statements in simplified form is 15.05%).

– Information related to off-balance sheet entries were found in 1,378 (16.75%) notes to the financial statements.

– Information related to hazardous waste appeared in 3,730 (45.34%) notes to the financial statements.

– Information related to environmentally harmful substances were included in 1,729 (21.02%) notes to the financial statements.

– Information related to environmental obligations are found in 1,941 (23.6%) notes to the financial statements.

– The entrepreneur is required to introduce the actual wealth, financial and profitability situation of the company as well as the composition of assets and liabilities.

– 3,186 business entities in their notes included information related to the wealth situation to the financial statements, which is 38.7% of the sample.

– 4,209 enterprises in their notes presented information related to the financial situation to the financial statements, which is means 51.16%.

– Profitability situation was presented by 4,583 enterprises, which represents 55.71% of the sample.

– The composition of assets was found in 769, while the composition of liabilities in 858 notes to the financial statements.

- The notes to the financial statement shall introduce the recommendation of utilizing after-tax profit, which can be found in 508 of the analyzed 8,226 notes to the financial statements, which is 6% of the sample.

The results related to the informative part of the notes to the financial statements were examined based on the company type. The test results are presented in Figure A.2 and Table 3. In Figure A.2, column graphs indicate - by company type - the proportion of occurrence of information belonging to the informative part of the notes to the financial statements. It is also clear from the figure that none of the entries reached above 60% occurrence. Occurrence above 50% was recorded in two cases; these items are financial position and the use of profitability what was followed by information related to hazardous waste with an incidence rate of approximately 45%. In the case of Plcs, information related to environmental protection had values above 40%, and in the case of Ltds and the Lps, the incidence rate is lower. The law stipulates that companies must present the composition of their wealth broken down by assets and liabilities. The figure shows that the composition of assets was introduced in more cases (30%) than the composition of liabilities (10%). The lowest occurrence was recorded in the case of research and experimental development, which probably does not refer to negligence, but rather to the fact that this item does not appear in a large number at these enterprises.

However, there are certain items with low incidence, which are not mentioned more frequently, because they are not relevant in the case of certain companies. In the figure, the continuous line in the section of column graphs indicates the average incidence of given characteristics within the total sample.

4.4. Differences among the information in the informative part of notes by company type

Comparison of the frequencies of terms obtained using text mining by company type was tested using χ^2 -test and t-test, the results of which are shown in Table 3 concerning the assets side of the balance sheet. Null hypothesis (H_0) of the χ^2 test was that the frequencies of balance sheet entries belonging to each of the company types are independent of each other, so there is no connection between the

company type and the occurrence of the particular balance sheet item within the notes to the financial statements. The alternative hypothesis of the test (H_1) is the reverse of the previous one. Pearson's χ^2 test was applied to perform the test. It can be seen in Table 3 that in the case of five characteristics (items 1, 4, 7, 9, 11) independence can be established, namely the frequency of occurrence of these characteristics is independent of the company type. In the case of the rest of the items, at the significance level of at least 10%, the frequency of occurrence depends on the company type. Frequencies of occurrence by company type are shown in Figure A.2.

The last three columns of Table 3 show the results of a test in the course of which we analyzed - using applying pairwise t-test - which business types are different regarding the frequency of disclosures and we indicated where (in the case of which business type) the higher values were found. According to the table, it is clear that the results of the χ^2 -test and t-test are synchronous with each other, and it can be established that the deviation is significant on a level of at least 5% between Ltds and the Lps, for the benefit of Ltds, where the respective level of significance can be found in the χ^2 test. There was a significant difference between Plcs and Lps in six cases - of which two are only significant at a level of 10% - in five cases for the benefit of Lps. In the case of the analysis of Plcs and Ltds, there was a significant difference for the benefit of the Plcs for two of three factors.

4.5. The adequacy level of the notes to the financial statements with legal requirements

Based on the results presented in the previous chapters, it can be established that the companies investigated only partially fulfill the information requirements prescribed by the Accounting Act in the notes to the financial statements. We chose the IT service sector in the research because the companies in this sector are related to the processing, storage, and transmission of information in some form. We believed that these companies are more sensitive to provide information for their stakeholders and they comprehend better the importance of the information provided. The results, however, did not substantiate our expectations.

Table 3. Results of statistical tests related to the distribution of information belonging to the informative part of the notes to the financial statements, shown by business type

No.	Searched term	χ^2 test	t-test		
			Ltd-Lp	Plc-Lp	Plc-Ltd
1	Assets	*	*(+)		
2	Financial position				
3	Income position	**	**(+)		
4	Assets composition				
5	Liquidity	.	.(+)		
6	Composition of equity and liabilities	***	***(+)		
7	Profitability	***	***(+)		
8	Net income use				
9	Employed workers	***	***(+)		
10	Average statistical number of employees				
11	Research and experimental development	**		**(+)	***(+)
12	Dangerous waste				
13	Environmentally harmful substance	***	***(+)	.(+)	
14	Environmental obligation	***	***(+)	.(+)	
15	Permise	***	***(+)	*(+)	
16	Cash flow statement	***		***(-)	***(-)
17	Environment protection	***	**(+)	*(+)	.(+)

Source: own calculation. Significance levels: *** - 0.1%, ** - 1%, * - 5%, . - 10%
 (+) upon calculation of difference, the value of the 1st item is higher.
 (-) upon calculation of difference, the value of the 2nd item is higher.

The results cannot be compared with other studies because we have not found similar ones in the literature. The international literature was processed by the Scopus and Web of Science databases. There have been studies in which the content of financial statements has been investigated, but they differed considerably from our research:

– Chakraborty and Vasarhelyi (2017) examined the pension notes of the financial statements in the case of 500 companies how it is possible to create search taxonomies in the XBRL and other systems and to develop a hybrid method.

– Mathies and Coners (2015) examined the 114 financial statements of DAX companies in the industrial sector with computer-aided text analysis, but they did not communicate the results of the analysis. They have mainly made theoretical findings.

– Fradeani et al. examined about one million Italian companies what use the fully XBRL format in the disclosure of their financial reports between 2010 and 2015. They analyzed the instances with errors and the double filings of the financial reports.

Since there are no similar analyses in the literature, we can not compare our results with the results of other research. Other researchers only examined subfields, they have studied only a small part of the notes to the financial statements.

5. CONCLUSION

Well-founded corporate decision-making requires that we have the adequate information about partner companies. The balance sheet and the income statement do not always provide sufficient information. The correct use of the information content of the balance sheet and the income statement may often require the explanations included in notes to the financial statements.

For companies to be able to grow sustainably and to create value in the midst of sustained economic growth and thus to increase the wealth of the company, it is essential for them to be aware of the key features and performance of their partner companies. Essential sources of information on the activities of partner companies are the financial statements and its notes to the financial statements.

By the performed analysis in the case of information service sector, it can be stated that there

are differences regarding the information related to the general and informative parts of the notes to the financial statement. Based on the results it can be stated that the companies investigated announce more information in the informative part (average frequency: 27.73%; minimum: 0.51%; maximum: 62.61%) than in the general part (average frequency: 19.95%; minimum: 0.06%; maximum: 72.04%) of the notes to financial statements.

Results of the performed statistical test show that the majority of analyzed attributes is different by company type. There were 11 (64.71%) significant differences in the significance level of at least 5% in general and the informative parts of the notes to the financial statements.

It can be stated based on the results, that a significant part of the companies investigated does not devote to complete the parts of the notes to the financial statements adequately.

Globalized market competition and the resulting rapid corporate response demands the availability of accurate information. Therefore every company has to disclose information in their annual statements, which support the decision-making of their partners.

The 'tm' package of the R statistical system is suitable for the rapid extraction of information from a large amount of textual material. The extracted information can be promptly processed using the modules of the R statistical system, and their visualization is also easily executable.

The public disclosure system of financial statements should be improved in Hungary too. There should be introduced the XBRL-based recording of the financial reports what facilitates the processing of financial reports, and their notes too.

This research has some limitations what we should take account of. First of all, it is complicated to create a perfect taxonomy, so the number of counted phrases may not be accurate. There were some notes to the financial statements that we could not be processed due to the inappropriate format, but their number (7.13% of the total number of companies which have notes to the financial statements) is small compared to the total population. The results of the analysis concern only one sector and can not be generalized. Since we did not find any similar analysis in the literature, we can not make comparisons.

REFERENCES

1. Aureli S. (2017). A comparison of content analysis usage and text mining in CSR corporate disclosure. *The International Journal of Digital Accounting Research*, 17, 1-32. https://doi.org/10.4192/1577-8517-v17_1
2. Avallone, F., Ramassa, P., & Roncagliolo, E. (2016). XBRL extension to the financial statement notes: Field-based evidence on unlisted companies. *The International Journal of Digital Accounting Research*, 16, 61-84. https://doi.org/10.4192/1577-8517-v16_3
3. Baumgartner, R. J., & Ebner, D. (2010). Corporate sustainability strategies: Sustainability profiles and maturity levels. *Sustainable Development*, 18(2), 76-89. <https://doi.org/10.1002/sd.447>
4. Bilder, C. R., & Loughin, T. M. (2015). *Analysis of categorical data with R*. Boca Raton, Florida: CRC Press, Taylor&Francis Group.
5. Bocken, N. M. P., Short, S. W., Rana, P., & Evans, S. (2014). A literature and practice review to develop sustainable business model archetypes. *Journal of Cleaner Production*, 65, 42-56. <https://doi.org/10.1016/j.jclepro.2013.11.039>
6. Böcskei E. (2014). A számviteli politika előtérbe kerülése – A belső számvitel információtartalma, mint a vezetői számvitel alapja [The accounting policy comes to the front – Internal accounting information support like the foundation of the managerial accounting]. *Controller Info. Copy & Consulting Kft. 2014/II.*, 38-43.
7. Chakraborty, V., & Vasarhelyi, M. (2017) A hybrid method for taxonomy creation. *The International Journal of Digital Accounting Research*, 17, 33-65. https://doi.org/10.4192/1577-8517-v17_2
8. Chelan, M. M., Alijanpour, A., Barani, H., Motamedi, J., Azadi, H., & Van Passel, S. (2018). Economic sustainability assessment in semi-steppe rangelands. *Science of the Total Environment*, 637-638, 112-119. <https://doi.org/10.1016/j.scitotenv.2018.04.428>
9. Cheung, E., & Lau, J. (2016). Readability of notes to the financial statements and the adoption of IFRS. *Australian Accounting Review*, 26(2), 162-176. <https://doi.org/10.1111/auar.12087>

10. Davies, I. A., & Chambers, L. O. (2018). Integrating hybridity and business model theory in sustainable entrepreneurship. *Journal of Cleaner Production*, 177, 378-386. <https://doi.org/10.1016/j.jclepro.2017.12.196>
11. Debreceeny, R. S., Chandra, A., John J. Cheh, J. J., Guithues-Amrhein, D., Neal J. Hannon, N. J., Hutchison, P. D., Janvrin, D., Ann Jones, R., Lamberton, B., Lymer, A., Mascha, M., Nehmer, R., Roohani, S., Srivastava, R. P., Trabelsi, S., Tribunella, T., Trites, G., & Vasarhelyi, M. A. (2005). Financial reporting in XBRL on the SEC's EDGAR system: A critique and evaluation. *Journal of Information Systems*, 19(2), 191-210. <https://doi.org/10.2308/jis.2005.19.2.191>
12. Delhey, J. N., & Steckermeier, L. C. (2016). The good life, affluence, and self-reported happiness: Introducing the good life index and debunking two popular myths. *World Development*, 88, 50-66. <https://doi.org/10.1016/j.worlddev.2016.07.007>
13. Feinerer I., Hornik K., & Meyer D. (2008). Text mining infrastructure in R. *Journal of Statistical Software*, 25(5), 1-54. <https://doi.org/10.18637/jss.v025.i05>
14. Feinerer, I. (2008). An introduction to text mining in R. *R News*, 8(2), 19-22. Retrieved from the World Wide Web: https://cran.r-project.org/doc/Rnews/Rnews_2008-2.pdf
15. Fradeani, A., Panizzolo, D., & Metushi, E. (2016). Financial reporting in XBRL: First evidence on financial statement notes of Italian unlisted companies. *The International Journal of Digital Accounting Research*, 16, 85-115. https://doi.org/10.4192/1577-8517-v16_4
16. Freeman, R. E. (2010). *Strategic management: A stakeholder approach*. Cambridge: Cambridge University Press.
17. Fridrich, P., & Simon, Sz. (2018). Kiegészítő melléklet I. rész [Notes to financial statements I.]. *Számviteli tanácsadó*, X(5), 2-12.
18. Fritz, M., & Koch, M. (2014). Potentials for prosperity without growth: Ecological sustainability, social inclusion and the quality of life in 38 countries. *Ecological Economics*, 108, 191-199. <https://doi.org/10.1016/j.ecolecon.2014.10.021>
19. Gill, A., & Biger, N. (2012). Barriers to small business growth in Canada. *Journal of Small Business and Enterprise Development*, 19(4), 656-668. <https://doi.org/10.1108/14626001211277451>
20. Haltiwanger, J. (2011). *Firm dynamics and economic productivity growth*. Retrieved from the World Wide Web: http://econweb.umd.edu/~haltiwanger/Haltiwanger_october_27_2011f.pdf
21. Hami, N., Muhamad, M. R., & Ebrahim, Z. (2015). The impact of sustainable manufacturing practices and innovation performance on economic sustainability. *Procedia CIRP*, 26, 190-195. <https://doi.org/10.1016/j.procir.2014.07.167>
22. Henderson, C., Huerta, E., & Glandon, T. A. (2015) Standardizing the presentation of financial data: Does XBRL's taxonomy affect the investment performance of nonprofessional investors? *The International Journal of Digital Accounting Research*, 15, 127-153. https://doi.org/10.4192/1577-8517-v15_5
23. Heumann, C., Schomaker, M., & Shalabh (2016). *Introduction to Statistics and Data Analysis. With Exercises, Solutions and Applications in R*. Switzerland: Springer International Publishing. <https://doi.org/10.1007/978-3-319-46162-5>
24. Hudson, M., Lean, J., & Smart, P. A. (2001). Improving control through effective performance measurement in SMEs. *Production Planning & Control*, 12(8), 804-813. <https://doi.org/10.1080/09537280110061557>
25. Kallis, G. (2011). In defence of degrowth. *Ecological Economics*, 70(5), 873-880. <https://doi.org/10.1016/j.ecolecon.2010.12.007>
26. Kántor B. (2016). A kiegészítő melléklet [Notes to the financial statements]. *Számviteli tanácsadó*, VIII(3), 2-11.
27. Kwartler T. (2017). *Text mining in practice with R* (1st ed.). Chichester, UK: John Wiley & Sons Ltd. <https://doi.org/10.1002/9781119282105>
28. Lagoarde-Segot, T., & Paraque, B. (2018). Finance and sustainability: From ideology to utopia. *International Review of Financial Analysis*, 55, 80-92. <https://doi.org/10.1016/j.irfa.2017.10.006>
29. Lakatos, L., Kovács, D., Madarasiné Szirmai, A., Mohl, G., & Rózsa I. (2018). *A nemzetközi pénzügyi beszámolási standardok elmélete és gyakorlata [Theory and practice of international financial reporting standards]*. Budapest: Magyar Könyvvizsgálói Kamara.
30. Łęgowik-Swiaćek, S. (2015). Evaluation of decision-making processes with reference to cost information management. *Polish Journal of Management Studies*, 11(2), 91-99. Retrieved from the World Wide Web: <https://pjm.s.zim.pcz.pl/resources/html/article/details?id=167338>
31. Lloret, A. (2016). Modeling corporate sustainability strategy. *Journal of Business Research*, 69(2), 418-425. <https://doi.org/10.1016/j.jbusres.2015.06.047>
32. Martínez-Alier, J., Pascual, U., & Vivien, F.-D., & Zaccai, E. (2010). Sustainable de-growth: Mapping the context, criticism and future prospects of an emergent paradigm. *Ecological Economics*, 69(9), 1741-1747. <https://doi.org/10.1016/j.ecolecon.2010.04.017>
33. Matthies, B., & Coners, A. (2015). Computer-aided text analysis of corporate disclosures - Demonstration and evaluation of two approaches. *The International Journal of Digital Accounting Research*, 15, 69-98. Retrieved from the World Wide Web: <http://hdl.handle.net/10272/10922>
34. Munzert, S., Rubba, C., Meißner, P., & Nyhuis, D. (2014). *Automated data collection with R: A practical guide to web scraping and text mining*. Chichester, UK: John Wiley and Sons, Ltd. <https://doi.org/10.1002/9781118834732>
35. Musinszki, Z. (2016). Pénzügyi mutatókon innen és túl [From here and beyond of the financial ratios]. *Észak-magyarországi Stratégiai Füzetek*, XIII(2), 71-80. Retrieved from the World Wide Web: http://www.strategiaifuzetek.hu/files/84/Strategiei%20fuzetek_2016_2.pdf
36. Panizzolo, D., Fradeani, A., & Metushi, E. (2017). Financial reporting practices of Italian SMEs: Why do they disclose more? *The International Journal of Digital Accounting Research*, 17, 111-137. https://doi.org/10.4192/1577-8517-v17_5
37. Peek, J. (2013). *The impact of credit availability on small business exporters*. Retrieved from the World Wide Web: [https://www.sba.gov/sites/default/files/files/rs404tot\(3\).pdf](https://www.sba.gov/sites/default/files/files/rs404tot(3).pdf)
38. Schaltegger, S., & Wagner, M. (2011). Sustainable entrepreneurship and sustainability innovation: categories and interactions. *Business Strategy and the Environment*, 20(4), 222-237. <https://doi.org/10.1002/bse.682>
39. Sharma, M. K., Bhagwat, R., & Dangayach, G. S. (2005). Practice of performance measurement: Experience from Indian SMEs. *International Journal of Globalisation and Small Business*, 1(2), 183-213. <https://doi.org/10.1504/IJGSB.2005.008014>
40. Socea, A.-D. (2012). Managerial decision-making and financial accounting information. *Procedia-Social and Behavioral Sciences*, 58, 47-55. <https://doi.org/10.1016/j.sbspro.2012.09.977>

41. Tamidi, M., & Roni R. A. (2014). An international comparison of the determinants and financial information quality in XBRL reporting environment. *Procedia-Social and Behavioral Sciences*, 164, 135-140. <https://doi.org/10.1016/j.sbspro.2014.11.061>
42. Taticchi, P. (2010). *Business performance measurement and management. New contexts, themes and challenges*. Germany: Springer. <https://doi.org/10.1007/978-3-642-04800-5>
43. Tokic, D. (2012). The economic and financial dimensions of degrowth. *Ecological Economics*, 84, 49-56. <https://doi.org/10.1016/j.ecolecon.2012.09.011>
44. Torugsa, N. A., O'Donohue, W., & Hecker, R. (2012). Capabilities, proactive CSR and financial performance in SMEs: Empirical evidence from an Australian manufacturing industry sector. *Journal of Business Ethics*, 109(4), 483-500. <https://doi.org/10.1007/s10551-011-1141-1>
45. Van den Bergh, J. C. J. M. (2011). Environment versus growth - A criticism of "degrowth" and a plea for "a-growth". *Ecological Economics*, 70(5), 881-890. <https://doi.org/10.1016/j.ecolecon.2010.09.035>
46. Vlasova, M., Pimenova, A., Kuzmina, S., & Morozova, N. (2016). Tools for company's sustainable economic growth. *Procedia Engineering*, 165, 1118-1124. <https://doi.org/10.1016/j.proeng.2016.11.828>
47. Welbers, K., Van Atteveldt, W., Benoit, K. (2017). Text analysis in R. *Communications Methods and Measures*, 11(4), 245-265. <https://doi.org/10.1080/19312458.2017.138723>
48. Wiersch, M. A., & Shane, S. (2013). Why small business lending isn't what it used to be. *Economic Commentary*, 10. Retrieved from the World Wide Web: <https://www.clevelandfed.org/newsroom-and-events/publications/economic-commentary/2013-economic-commentaries/ec-201310-why-small-business-lending-isnt-what-it-used-to-be.aspx>
49. Yip, A. W. H., & Bocken, N. M. P. (2018). Sustainable business model archetypes for banking industry. *Journal of Cleaner Production*, 174, 150-169. <https://doi.org/10.1016/j.jclepro.2017.10.190>

Appendix A

Figure A.1. Mean values of terms related to the general part of the notes to the financial statement by business type

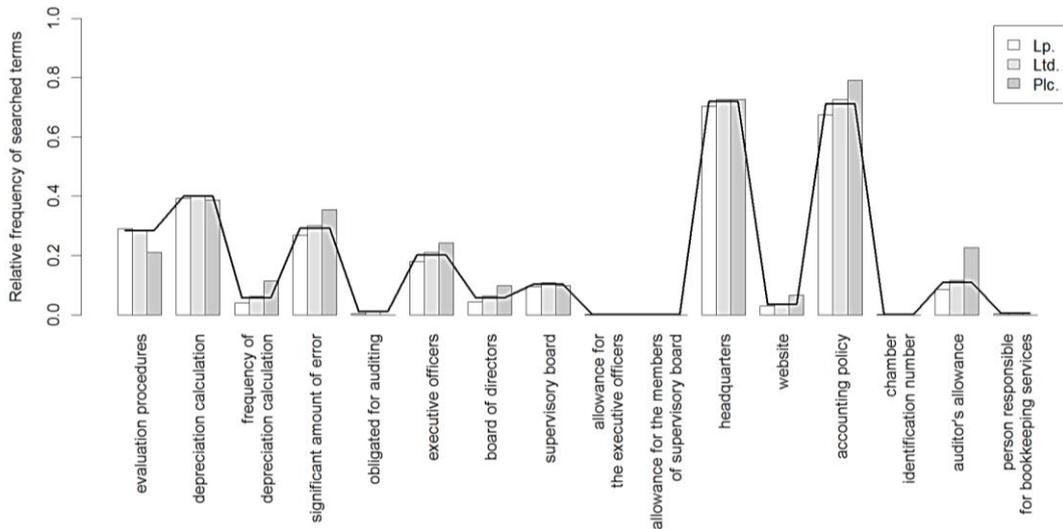


Figure A.2. Mean values of terms related to the informative part of the notes to the financial statement by business type

