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**Determinants of Web-Based CSR Disclosure
in the Retail Sector of the Czech Republic**

Bachelor Thesis

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Abstract

Corporate social responsibility (CSR) is an engaging, momentous aspect of current business practices. Firms may build and reinforce stakeholder relationships by taking part in CSR projects. Companies, operating in the retail trade sector, may be of special interest as they aim to communicate with the general public, as potential customers. One may thus concentrate on observing their corporate social responsibility disclosure from commonly available information. Furthermore, to the best of our knowledge, only few studies document the corporate social responsibility efforts of firms in the Czech Republic. More research with this regard can hence provide new insights. We thus investigate the determinants of web-based CSR effort disclosure of retailing firms in the Czech Republic. The linear probability model, probit as well as logit are used in the analysis, together with a set of sub-sector, organizational, legal and financial explanatory variables. We find evidence of a positive relationship between the probability of CSR effort disclosure and EBIT. We also find some evidence that net debt, net profit, ROA as well as firm age are positively related to firm CSR effort reporting.

Keywords

corporate social responsibility, corporate social responsibility disclosure, sustainability, stakeholders, retailing, binary response models

Declaration of Authorship

I hereby proclaim that I wrote my bachelor thesis on my own under the leadership of my supervisor and that the references include all resources and literature I have used.

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Prague, July 30, 2018

Signature

Bachelor Thesis Proposal

Author: Viktória Mjartanová
Supervisor: doc. PhDr. Martin Gregor, Ph.D.
Proposed Topic: Determinants of Web-Based CSR Disclosure
in the Retail Sector of the Czech Republic

Research Question and Motivation:

What are the determinants of web-based CSR effort disclosure for retailing firms in the Czech Republic?

Corporate social responsibility is an alluring, consequential aspect of business. Companies may desire to improve their stakeholder relations and undertake CSR projects. A specifically interesting industry for investigation might be the retail trade sector. Customers are a crucial stakeholder group for retailing firms. Retailers, hence, face incentives to report publicly their CSR undertakings, in order to build stakeholder relationships with potential customers. Moreover, since the determinants of CSR effort disclosure in the Czech Republic have been only sparsely analyzed, it might be an interesting topic to examine.

Contribution:

To the best of our knowledge, a similar approach using regression models to study the determinants of corporate social responsibility effort disclosure within the retail market of the Czech Republic was not yet conducted. Our findings, hence, contribute to the sparse literature dealing with this topic.

Methodology:

A random sample of 220 firms is created. Financial, sub-sector, legal as well as organizational variables are included in the analysis. The linear probability model, probit and logit are estimated. Tests for multicollinearity as well as evaluation measures, including the R^2 and adjusted R^2 for the linear

probability model and information criteria, McFadden's R^2 as well as log likelihoods for the logistic and probit models are considered. Model accuracies are also reported. The significance and relationship of the explanatory variables with the probability of CSR effort disclosure is then examined.

Outline:

1. Introduction
2. Theories of CSR
3. Literature Review
4. Data Set
5. Methodology
6. Results
7. Conclusion

Relevant Literature:

- [1] Gamerschlag, R., Möller, K., & Verbeeten, F. (2011). Determinants of voluntary CSR disclosure: empirical evidence from Germany. *Review of Managerial Science*, 5, 233–262.
- [2] Deng, X., Kang, J.-K., & Low, B. S. (2013). Corporate social responsibility and stakeholder value maximization: Evidence from mergers. *Journal of Financial Economics*, 110(1), 87–109.
- [3] Ferrell, A., Liang, H., & Renneboog, L. (2016). Socially responsible firms. *Journal of Financial Economics*, 122(3), 585–606.
- [4] Magill, M., Quinzii, M., & Rochet, J. C. (2015). A theory of the stakeholder corporation. *Econometrica*, 83(5), 1685–1725.
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1 Introduction

Corporate social responsibility (CSR) is an upcoming, engaging concept found in the current business environment. The European Commission (2018) issued a strategy, aiming to promote CSR efforts of companies, and organizes forums dealing with corporate social responsibility. The United Nations Industrial Development Organization (2018) is actively encouraging CSR by small and medium sized enterprises. Corporate social responsibility has become a worldwide custom, worthy of sufficient attention. Research about the determinants of company engagement with CSR can then ascertain the prevailing conditions and help formulate effective programs or strategies, that would foster corporate social responsibility initiatives.

Yet, the definition of CSR may not be entirely unequivocal. The United Nations Industrial Development Organization (2018) considers CSR to take place when firms, in addition to their main activities, also express solicitude for the environment and society. The European Commission (2018) considers CSR to occur when companies behave responsibly with respect to society. Notable aspects, which firms can concentrate on, include the care for the environment, ethics, consumers, law and human rights (European Commission, 2018).

Importantly, corporate social responsibility may be a method for companies to improve and build stakeholder relationships. With this regard, the retail trade industry can be an interesting sector for analysis. An important stakeholder for retailing firms are customers. Firms in the retail industry thus have incentives to publish their CSR efforts, where these undertakings would be available for the general public, as possible customers. Companies can then be expected to present their CSR projects and activities on their web pages, where such efforts can reach a substantial audience. Moreover, few studies examine the corporate social responsibility environment in the Czech Republic. Therefore, more research about this topic can help enlighten and enlarge knowledge about the CSR practices within the Czech market. A noteworthy question to investigate might thus be, what are the

determinants of firm CSR effort reporting for the Czech retail sector.

This thesis then aims to analyze the determinants of web-based CSR effort disclosure, focusing on the retail trade industry in the Czech Republic. The linear probability model, probit and logit are estimated, using a set of structural as well as financial explanatory variables. We control for structural aspects such as the legal form of a firm, the location of its headquarters or its age since incorporation. We, moreover, observe various indicators of financial performance, such as the return on assets, return on capital employed, asset turnover, operating revenue, net debt, net profit, EBIT and book value. Additionally, sub-sector binary variables are also included to account for potential retail specialization differences. To the best of our knowledge, a similar study using regression models was not yet conducted for the retail trade sector in the Czech Republic. Hence, our results may provide interesting insight about the determinants of firm CSR effort reporting for this industry.

The following section, Theories of CSR, discusses different approaches to and views of corporate social responsibility. The third section, Literature Review, looks at past papers dealing with the determinants of CSR engagement and reports their findings as well as the used analysis methods. Additionally, previous studies dealing with the corporate social responsibility environment in the Czech Republic are discussed. A short overview of active CSR associations, portals and awards available in the Czech Republic is also included. The following section, Data Set, looks at the obtained sample, delineates the variables used in the investigation and presents a first look at the data. In the fifth section, Methodology, models, tests as well as evaluation measures included in the analysis are specified. The findings of the investigation are then presented and compared to previous literature in the Results section, together with a discussion of the limitations. We then conclude our findings and propose several possibilities for further research.

2 Theories of CSR

2.1 The Stakeholder Approach

A comprehensive approach to firm decision making and corporate social responsibility is the stakeholder approach. Firstly outlined in the book *Strategic Management: A Stakeholder Approach* by Robert E. Freeman, published in 1984, the stakeholder approach explains firm strategies with respect to its stakeholders. The main idea is that stakeholder welfare should be scrutinized and included in business operations (Freeman, 2004). It follows then that to account for the well-being of stakeholders and satisfy their values, a firm can participate in corporate social responsibility. This can thus strengthen relationships with various stakeholders.

Magill, Quinzii and Rochet (2015) also discuss the importance of stakeholders. They claim that by maximizing stakeholder instead of shareholder value, a firm can mitigate the externalities that it creates on consumers or employees. Moreover, this behavior can even lead to Pareto efficient outcomes (Magill et al., 2015). Firms can then cater to various stakeholder groups through corporate social responsibility.

Furthermore, focusing on the welfare of stakeholders by implementing CSR may even be financially beneficial for companies. Deng, Kang and Low (2013) discover that merger performance in terms of its returns is enhanced when a firm with large as opposed to low CSR efforts is acquired. They also find evidence that acquiring firms with higher levels of CSR is characterized by shorter duration and a larger probability of success (Deng et al., 2013). Dimson, Karakaş and Li (2012) likewise support these results and find that the first successful participation in CSR by public companies in the United States led to average future returns of 4.4%. Lins, Servaes and Tamayo (2017) find evidence that firms with larger CSR intensities had superior financial performance when compared to firms with lower CSR efforts even during the financial crisis. They propose that investing in corporate social responsibility can build stakeholder relationships as well as trust and thus bring benefits even in the presence of crises (Lins et al., 2017). Ad-

ditionally, Ferrell, Liang and Renneboog (2016) discover evidence that the negative impact of managerial entrenchment on firm value can be offset by corporate social responsibility. Firms can thus benefit and achieve enhanced performance by nurturing stakeholder relationships through engagement in CSR activities.

Firms can also participate in corporate social responsibility, focusing specially on the consumer stakeholder group. Park, Kim and Kwon (2017) provide some evidence that corporate social responsibility is linked with customer satisfaction and company trust. Odriozola and Baraibar-Diez (2017) emphasize a positive relationship between the quality of CSR disclosure and company reputation. Additionally, Perrini, Castaldo, Misani and Tencati (2010) investigate the market in Italy and find evidence that organic products, which are offered by firms active in CSR, are more trusted than organic merchandise, offered by firms inactive in CSR. Consequently, they claim that customers may even accept higher prices for goods, once this customer trust, induced by corporate social responsibility, is obtained (Perrini et al., 2010). The willingness to pay premium prices is also documented by Bjørner, Hansen and Russell (2004). In their study of the Danish market, consumers were found to be marginally willing to pay a premium of 13–18% of the price for a product with a certified environmental label (Bjørner et al., 2004). Yet Loussaïef, Cacho-Elizondo, Pettersen, and Tobiassen (2014) find evidence that consumers in France and Norway are rather skeptical of the corporate social responsibility efforts of firms and do not readily connect CSR and the selling of food merchandise. The authors, however, point out that CSR activities can still be beneficial if a clear connection between these efforts and the brand is established (Loussaïef et al., 2014). The stakeholder approach can then give prominent insight into corporate social responsibility and firm behavior. It points to the idea that if firms cultivate stakeholder relationships and maximize stakeholder value by adopting CSR practices, their performance will improve.

2.2 Mixed Views of CSR

Although the stakeholder approach provides a remarkable explanation for responsible business practices, CSR is not necessarily always viewed as a blessing. An alternative to the stakeholder approach is the inefficient regulation view. In a model by de Bettignies and Robinson (2015), firms may lobby for inefficient regulation of negative externalities, employ socially responsible workers, reduce their own externalities beyond the regulatory threshold and obtain rents for being responsible agents in an inefficiently regulated environment. Corporate social responsibility can thus also decrease total welfare (de Bettignies & Robinson, 2015). CSR may then be socially beneficial only in certain situations.

Kaul and Luo (2017) also find support for this notion. According to their model, if the CSR projects of for-profit firms are connected with their core business activities or the projects are distinct from the activities of non-profit organizations, then the CSR efforts of the for-profit companies will improve their financial performance. Moreover, both of the mentioned criteria have to be met for CSR activities to lead to an improvement in social welfare (Kaul & Luo, 2017). Thus, corporate social responsibility may be financially and socially beneficial only in certain circumstances. In other scenarios, CSR may perhaps reduce total welfare.

Other studies corroborate that corporate social responsibility may even be damaging to firm performance. Bhandari and Javakhadze (2017) discover that engaging in corporate social responsibility activities can hamper capital allocation efficiency of firms, which in turn leads to declined performance. Additionally, List and Momeni (2017) find that when CSR activities are undertaken, 20% more workers are found to evade their main responsibilities. The authors attribute this finding to moral licensing, according to which morally underpinned CSR may give way to immoral behavior in other matters (List & Momeni, 2017). There thus exists some evidence, that corporate social responsibility can also negatively impact firm performance.

Furthermore, numerous papers study the connection between corporate

social responsibility and stock performance. Examining this relationship is a complex task as there may be numerous signals that affect the stock market, but are also associated with the choice of CSR. With this regard, several studies obtain mixed results. Jacobs, Singhal, and Subramanian (2010) provide evidence that when firms obtain certifications or grant gifts to support the environment, the stock market reacts positively, but when firms willingly decrease their emissions, the market reacts negatively. Moreover, while Krüger (2015) finds that the market reacts negatively to social irresponsibility, it has mixed reactions to successful CSR undertakings. If the CSR efforts are aimed at alleviating past irresponsibility or stakeholder-related controversies, then the market reacts positively, but if the CSR efforts are suspected to be connected with agency issues, the market reacts negatively (Krüger, 2015). There is, thus, no conclusive statement on the relationship between corporate social responsibility and stock market performance. Certain CSR news may enhance stock performance, while others can deteriorate it. Some studies highlight the positive returns from corporate social responsibility, while others point to the existing detriments. Nevertheless, corporate social responsibility can be viewed as an important aspect of current business practices.

3 Literature Review

3.1 CSR Determinants

Current research about the determinants of corporate social responsibility varies in CSR measurement, scope and analysis methods. Researchers rely on indexes or company reports to identify company CSR efforts. Some literature focuses on specific countries, while other articles study certain regions or industries. Numerous papers highlight the importance of financial variables as well as the impact of ownership and position of stakeholders. Other considered variables encompass firm visibility, size, industry membership or organizational factors. Various models, such as linear regressions, logit, probit as well as Tobit models are used in the analyses.

Some authors use already existing indexes or construct their own to identify the corporate social responsibility efforts of companies. To study the determinants of CSR disclosure in Germany, Gamerschlag, Möller, and Verbeeten (2011) create an index using information from the Global Reporting Initiative. When searching for the characteristics of a board committee that would support corporate social responsibility, Eberhardt-Toth (2017) uses the membership in the Dow Jones Sustainability World Index to account for CSR. Cronqvist and Yu (2017) use the Kinder, Lydenberg and Domini Research & Analytics rating, while Ferrell, Liang and Renneboog (2016) use the Intangible Value Assessment (IVA) database to measure corporate social responsibility efforts. The IVA database is also used in another study by Liang and Renneboog (2017) to obtain CSR ratings for companies.

Other researchers use different methods to gauge firm CSR efforts. Sommer, Klink, Senkl, and Hartmann (2014) examine the situation in Germany, but focus specifically on the web-based disclosure of food processing companies in North Rhine-Westphalia. Utgård (2018) also examines web-based corporate social responsibility disclosure, but concentrates on the Norwegian retail trade industry. Moreover, in their analysis of Polish companies, Dyduch and Krasodomska (2017) look at firm reports to identify CSR efforts. Lu and Abeysekera (2014) also observe annual and specific CSR reports.

There are hence various methods that measure the presence or extent of corporate social responsibility efforts that firms disclose.

Numerous factors are observed and their impact on the CSR reporting of firms is studied. Some studies find that financial variables have an important relationship with CSR disclosure. Dyduch and Krasodomska (2017) find that one of the determinants of the amount of CSR disclosure is company turnover. Roberts (1992) presents evidence that return on equity is also an important factor. Lu and Abeysekera (2014) discover that profitability of a company is also a determinant of CSR effort disclosure. Moreover, Ferrell et al. (2016) report an association between firm value and firm CSR ratings. All of the mentioned studies identify a positive relationship between the financial performance of firms and their corporate social responsibility disclosure.

Another interesting aspect to account for in the analysis are the shareholders and other stakeholders. Gamerschlag et al. (2011) find that the free float¹ is one of the main determinants of CSR disclosure. Roberts (1992) discovers that stakeholder power is an important factor, while Dyduch and Krasodomska (2017) indicate the significance of foreign capital share. Utgård (2018) reports that foreign companies are more likely to disclose CSR efforts. Ferrell et al. (2016) provide evidence that proper corporate governance practices, such as powerful minority protection rights, are linked with more CSR activities. Park and Ghauri (2015) concentrate on small or medium sized foreign subsidiaries in emerging markets and discover that the attitudes of competitors as well as non-governmental organizations have an impact on firm CSR efforts. There is thus evidence that the position of various stakeholders is related to firm corporate social responsibility disclosure.

Moreover, a specifically interesting group to examine may be the board and directors. Eberhardt-Toth (2017) looks at board committee characteristics that are linked with CSR participation and finds that the fraction of independent directors, whether the CEO is part of the board, age, the presence of a female and size are all important factors. Furthermore, after

¹Free float indicates the dispersion of the shareholder structure (Gamerschlag et al., 2011).

controlling for variables such as assets, debt, value, age, tenure or equity, Cronqvist and Yu (2017) discover that the CEO having a daughter is positively related with the CSR rating of the firm.

Some investigations also consider firm visibility, image or reputation. Gamerschlag et al. (2011) connect firm visibility with CSR effort disclosure. Roberts (1992) discovers that the mean number of public affairs employees is one of the main determinants of corporate social responsibility reporting. Moreover, Dimson et al. (2012) cite concern about reputation to be one of the important factors, relating to successful CSR participation.

Several studies find the significance of other structural firm variables. Sommer et al. (2014) control for firm profitability, debt levels as well as closeness to market in their analysis. However, only firm size is found to be a major and positive determinant of CSR disclosure (Sommer et al., 2014). Lu and Abeysekera (2014) also claim that firm size is associated with firm CSR disclosure. The industry, in which a firm operates, may be another variable to consider. Dyduch and Krasodomska (2017) identify industry environmental sensitivity as an important factor. Lu and Abeysekera (2014) find a relationship between different industries and company CSR efforts. Organizational factors may also be included. Utgård (2018) provides evidence that private brands and vertical integration are associated with firm CSR effort disclosure.

Another approach may be to involve legal characteristics in the analysis. Liang and Renneboog (2017) present evidence that the legal origin of a country is an important determinant of CSR effort disclosure. Being a firm from a country with a civil law system, as opposed to a common law system, is found to be positively related with the CSR rating of the firm (Liang & Renneboog, 2017). Other studies include variables to account for the presence of firms on stock exchanges. Gamerschlag et al. (2011) identify being listed on the US stock exchange as one of the main determinants of CSR effort disclosure. Dyduch and Krasodomska (2017) find evidence that the duration of the stock exchange listing has a relationship with the level

of CSR reporting.

Current research concerned with the determinants of CSR disclosure predominantly focuses on using econometric models, namely ordinary least squares, logit, probit, Tobit or a combination of these. For example, Gammerschlag et al. (2011) use a probit and a linear regression, while Sommer et al. (2014) include an ordered logit. Eberhardt-Toth (2017) also uses a logistic regression. Dimson et al. (2012) use multivariate probit models. Linear regressions are used by Lu and Abeysekera (2014), Park and Ghauri (2015) and by Cronqvist and Yu (2017). Dyduch and Krasodomska (2017) use a Tobit regression.

An interesting approach is used in the analysis of CSR effort disclosure within the Norwegian retail industry. Utgård (2018) uses three models, a hurdle regression, ordinary least squares and Tobit. The hurdle regression is chosen precisely because it can deal with a dependent variable containing numerous zeros comparably better than a standard linear regression (Utgård, 2018). Moreover, Liang and Renneboog (2017) first compare the median CSR ratings for firms from different legal origins of the studied countries. Since the CSR performance ratings do not follow a normal distribution, the researchers use the non-parametric Wilcoxon rank-sum or Mann-Whitney test and then estimate several models, including the ordinary least squares, random effects generalized least squares and a random effects ordered probit (Liang & Renneboog, 2017). In another paper, Ferrell et al. (2016) use the instrumental variable approach. Various models and approaches are thus used to investigate the determinants of CSR effort disclosure.

3.2 The Situation in the Czech Republic

Corporate social responsibility is a worldwide business phenomenon. It naturally also pervades the Czech market. There exist various associations and organizations dealing with corporate social responsibility in the Czech Republic as well as awards for CSR projects. We present a list of several of the portals and associations to map out the undertakings that are taking place

within the Czech market.

For example, the United Nations Global Compact Network (2018), active in the Czech Republic, promotes corporate social responsibility efforts. The network follows ten core principles, relating to human rights, working conditions, environmental friendliness and honorable business practices, such as the condemnation of bribery or corruption (United Nations Global Compact Network Czechia, 2018). It works together with the Asociace společenské odpovědnosti² (2018), which aims to create a platform for companies to reinforce and advance firm CSR activities. Asociace společenské odpovědnosti (A-CSR) organizes events and networking occasions and thus provides support for its member companies (Asociace společenské odpovědnosti, 2018). A-CSR (2018) together with the United Nations Global Compact Network in the Czech Republic also offer the SDG³ awards. These awards aim to encourage the fulfillment of the SDGs in the Czech Republic (Asociace společenské odpovědnosti, 2018).

Another platform is the Business Leaders Forum (2018), which provides support and help to companies with the implementation and undertaking of corporate social responsibility projects. The platform is also a member of a broader, international organization named CSR Europe (Business Leaders Forum, 2018). Other notable organizations include the Czech Business Council for Sustainable Development (2018), which is a partner with the World Business Council for Sustainable Development.

Furthermore, there also exists an official portal for CSR in the Czech Republic. This portal is supported by the Czech Ministry of Industry and Trade and offers a place for discussion of CSR related topics and efforts as well as awards for sustainable development, a special CSR award for small or medium sized companies or various regional CSR awards (Národní informační portál o CSR, 2018). There are thus numerous associations and portals active in the Czech Republic that support and nurture the corporate

²Asociace společenské odpovědnosti may be translated as the Association of Corporate Social Responsibility.

³SDG refers to the Sustainable Development Goals (Asociace společenské odpovědnosti, 2018).

social responsibility efforts of firms.

Although various CSR organizations, portals and awards exist, firm participation in corporate social responsibility within the Czech Republic has been studied only sparsely. Papers that describe the Czech CSR practices study the opinions of firm representatives about corporate social responsibility (Srpová, Kunz, & Mísař, 2012), the involvement of multinational corporations (Dvořáková & Quigley, 2014), the involvement within the forestry and logging industry (Haltofová & Adámek, 2014) as well as the participation of major banks (Burianová & Paulík, 2014). The studies mainly use surveys and descriptive statistics to perform analyses. Econometric models are not included in any of the found papers. There thus remains space for more research about corporate social responsibility efforts in the Czech Republic and new studies can bring enlightening results. These results may then be further used to structure policies or campaigns aimed at advancing corporate social responsibility initiatives within the country.

4 Data Set

4.1 The Sample

This thesis analyzes web-based CSR effort disclosure in the Czech Republic. As few studies document this environment, it is an interesting area of research. The analysis concentrates only on the retail industry. An important stakeholder for retail firms are customers. Following the stakeholder approach, firms may want to build responsible relationships with their customers through corporate social responsibility. Since clear communication with the public, as potential customers, is important for the retail industry, information about CSR participation should be publicly available. Moreover, we assume that if retailing firms engage in CSR activities, they have incentives to also report these efforts on their web sites.

Company and industry data from the Emerging Markets Information System (EMIS) are used. This database gathers and presents industry and company level information for more than 125 emerging markets (Emerging Markets Information System, 2018). The CZ-NACE classification of economic activities, carried out by the Czech Statistical Office (2017), was used for industry and sub-sector classification. Firms, classified in Section G 47 retail trade⁴, are included in the analysis. The sub-sectors include: retail sale in non-specialized stores, retail sale of food, beverages and tobacco in specialized stores, retail sale of automotive fuel in specialized stores, retail sale of computers and communication equipment in specialized stores, retail sale of other household goods in specialized stores, retail sale of cultural or recreational goods in specialized stores, retail sale of other goods in specialized stores and retail sale not carried out in stores, stalls or market places (Czech Statistical Office, 2017). Table A1, explaining all the available sub-sectors for the Czech market with data at EMIS (2018), is in the Appendix. There is one sub-sector in the CZ-NACE classification of the Czech Statis-

⁴According to the Czech Statistical Office (2017), Section G consists of three parts. Part 47 constitutes retail trade, part 46 constitutes wholesale trade and part 45 constitutes the wholesale, retailing and repairing of motor vehicles (Czech Statistical Office, 2017).

tical Office (2017), retailing through stalls and on markets, for which there was no information in the EMIS database (2018). This sub-sector is thus not included in the analysis.

Finally, a random sample of 220 firms was created. The total number of firms with available data was 622. As the type of main activities of a firm may be an important aspect, the sub-sector proportions were maintained in the sample to keep representativeness of the sample. In the population about 20% of the firms were part of the retail sale in non-specialized stores, 4% were part of the retail sale of food, beverages and tobacco in specialized stores, 14% were part of the retail sale of automotive fuel in specialized stores, 3% were part of the retail sale of computers and communication equipment in specialized stores, 17% were part of the retail sale of other household goods in specialized stores, 5% were part of the retail sale of cultural or recreational goods in specialized stores, 28% were part of the retail sale of other goods in specialized stores and 9% were part of the retail sale not carried out in stores, stalls or market places. The proportions in the sample were: 20.5% in non-specialized stores, 3.6% in the specialized sale of food, beverages and tobacco, 13.6% in the specialized sale of automotive fuel, 3.2% in the specialized sale of computers and communication equipment, 16.8% in the specialized sale of other household goods, 4.5% in the specialized sale of cultural or recreational goods, 28.6% in the specialized sale of other goods and 9.1% in retail sale not carried out in stores, stalls or market places.

4.2 Considered Variables

All firm data was obtained from the EMIS database (2018). The analysis uses a cross section with data from 2016, the most recent available year at the time of data gathering. The data set contains financial variables as well as information about other structural firm attributes. The aim was to gather variables about various sub-sectors, organizational characteristics as well as legal features. The set of gathered structural explanatory variables is described in Table 1.

Table 1: Structural Independent Variables

Type	Variable	Description
Sub-sectors	furniture	Dummy variable for the selling of other household goods
	fuel	Dummy variable for the selling of automotive fuel
	comp	Dummy variable for the selling of computers and communication equipment
	leisure	Dummy variable for the selling of cultural or recreational goods
	non_special	Dummy variable for the selling in non-specialized stores
	non_store	Dummy variable for retail selling not conducted in stores, stalls or market places
	other_special	Dummy variable for the selling of other goods in specialized stores
Organization	prague	Dummy variable for headquarters in Prague
Legal	llc	Dummy variable, equal to 1 if legal form is Limited Liability Company
	plc	Dummy variable, equal to 1 if legal form is Public Limited Company
	age_incorp	Age from date of incorporation in years

Dummy variables for the individual sub-sectors are included. There are eight sub-sectors, so seven dummy variables, *furniture*, *fuel*, *comp*, *leisure*, *non_special*, *non_store* and *other_special* are created. As mentioned in Section 3.1, Dyduch and Krasodomska (2017) as well as Lu and Abeysekera (2014) find evidence that membership in various industries is related with firm CSR effort. In our case, we observe the retail trade industry, however, it might be interesting to control for sub-sector specialization differences.

Organizational variables may also be of interest and could be controlled for. The EMIS database (2018) provides information about the city of headquarters of each firm. Out of this data, the variable *prague* was created. Legal characteristics may also be accounted for. The legal forms of the firms

in the sample were Limited Liability Company, Public Limited Company or other legal forms. Hence the variables *llc* and *plc* were formed. Furthermore, we may also control for the age of a firm, as measured by years since incorporation. Additionally, Gamerschlag et al. (2011) find some evidence that being listed on the stock exchange in the United States is an important factor related to firm CSR effort reporting. Likewise, Dyduch and Krasodomska (2017) document the significance of the length of a stock exchange listing. According to the information from EMIS (2018), in our population, all of the firms are unlisted. We, therefore, do not have a separate variable that accounts for this aspect.

Financial variables are also included in the analysis. These are summarized by Table 2. They can account for size, such as *operating_rev*, debt levels, such as *net_debt*, or profitability, such as *ebit* and *net_profit*. Common profitability and efficiency ratios, such as return on assets (ROA), return on capital employed (ROCE) and asset turnover, are also used. The book value of a firm is included, as well.

Table 2: Financial Independent Variables

Variable	Description
<i>operating_rev</i>	Operating revenue in millions of CZK
<i>net_debt</i>	A company's debt minus its cash and cash equivalents in millions of CZK
<i>ebit</i>	Earnings before interest and tax in millions of CZK
<i>net_profit</i>	Net profit or loss in millions of CZK
<i>roa</i>	Return on assets
<i>roce</i>	Return on capital employed
<i>asset_turnover</i>	A ratio of a company's net sales to its assets
<i>bookvalue</i>	The value of a company if it liquidated its assets and repaid all liabilities in millions of CZK

Note: Definitions are obtained from EMIS (2018).

As discussed in Section 3.1, Sommer et al. (2014) and Lu and Abeysekera (2014) find evidence that firm size is positively associated with firm CSR effort disclosure. We can thus hypothesize that operating revenue will be

positively related with firm CSR disclosure. Moreover, we follow Lins et al. (2017), who find evidence that firms with more CSR activities also incurred more debt. We thus also hypothesize that net debt will be positively related to CSR effort disclosure. Furthermore, we also consider the hypothesis that EBIT and net profit will be positively associated with CSR effort disclosure, as Lu and Abeysekera (2014) report a relationship between firm profitability and corporate social responsibility disclosure. We can also assert the hypothesis that ROA, ROCE and asset turnover will have a positive relationship with firm CSR effort disclosure, as Roberts (1992) discovers an association between the annual change in ROE, as an indicator of economic performance, and CSR reporting. We, furthermore, can expect that the book value of a firm will be positively related with its CSR reporting. This notion follows the findings of Ferrell et al. (2016), which claim that the firm value is positively associated with its corporate social responsibility rating.

The dependent variable, *csr*, is a binary variable equal to one if a company disclosed CSR effort on their web site. To reap the benefits of corporate social responsibility, it is essential for it to be properly communicated and disclosed. Retail companies can then be expected to communicate their CSR efforts publicly and openly to address the largest audience of possible customers. To identify whether a company disclosed corporate social responsibility effort, the web pages of the firms were examined. A similar approach is used by Utgård (2018) and Sommer et al. (2014). Moreover, a firm is considered to be participating in corporate social responsibility if it presented evidence of a CSR undertaking in the year 2016. For example, concrete CSR projects, donations or obtaining a certification for environmental friendliness are taken as evidence. A vague statement, declaring that a company cares about the environment and society without any concrete project to support this claim, is not taken as evidence.

4.3 The Data and Summary Statistics

The percentage of firms, which disclose CSR participation, is about 14% in the sample. 72% of the firms in the sample are a Limited Liability Company, while about 17% are a Public Limited Company. Around 37% have their headquarters in Prague. The summary statistics for the other non-dummy variables are presented in Table 3. In 2016, the youngest firm had 2 years

Table 3: Summary Statistics

Variable	Mean	St. Dev.	Min	Max
age_incorp	20.232	13.449	2.000	63.000
operating_rev	1,231.036	5,405.914	0.000	49,999.880
net_debt	58.116	864.269	-4,783.000	8,224.500
ebit	35.349	126.608	-18.110	1,083.000
net_profit	23.436	92.104	-30.190	881.000
roa	0.061	0.168	-1.234	0.692
roce	-0.036	1.642	-19.434	2.540
asset_turnover	3.261	3.119	0.000	20.830
bookvalue	121.352	928.217	-7,971.190	9,766.000

since incorporation, while the oldest firm had 63 years. The negative minimum value of *net_debt* means that the company has more cash and cash equivalents than debt. A negative EBIT value indicates negative earnings or losses. Similarly, a negative value for net profit means losses. Negative ratios for ROA and ROCE as well as a negative book value are also signs of business problems.

Various financial explanatory variables are included in the analysis. Considering their nature, one may suspect a strong correlation to be present among them. We report correlations that are over 0.7. The variables *operating_rev* and *ebit* have a correlation of 0.759. The variables *net_profit* and *ebit* have a correlation of 0.945. There is, hence, some evidence of strong correlations among the financial explanatory variables. This issue may be referred to as multicollinearity. Although strong multicollinearity does not violate the underlying regression assumption of no perfect collinearity among

the explanatory variables, it can still result in problems when estimating models (Wooldridge, 2013). It should hence be taken into account. A more detailed explanation of the approach can be found in Section 5.2.

5 Methodology

5.1 Models

The linear probability model, probit and logit may be used to analyze the determinants of CSR effort disclosure. We will thus be estimating the response probability of reporting CSR effort. According to Wooldridge (2002), the linear probability model can be specified as

$$P(csr = 1|\mathbf{x}) = \beta_0 + \beta_1x_1 + \dots + \beta_kx_k, \quad (1)$$

where $\mathbf{x} = (x_1, x_2, \dots, x_k)$.

The model, however, has certain downsides. Wooldridge (2013) describes these issues. Firstly, the author notes that fitted values can be greater than 1 or less than 0. Additionally, he mentions that the estimated marginal effect of the explanatory variables on the probability of an event is estimated to be constant (Wooldridge, 2013). Furthermore, another issue with the linear probability model is the violation of normality. However, according to Wooldridge (2013), if the sample is sufficiently large, asymptotic normality may still be satisfied by the central limit theorem. Since the data set contains 220 observations, large sample inference can be used to test for individual variable significance.

Moreover, according to Wooldridge (2013), as the dependent variable can only take on the values 1 or 0, the linear probability model does not have homoskedastic variance, but instead has in-built heteroskedasticity. The standard errors are then invalid and the usual t and F statistics cannot be used (Wooldridge, 2013). To deal with the violation of homoskedasticity White's standard errors can be used. According to Wooldridge (2013), the variance of coefficient $\hat{\beta}_j$ can then be estimated as

$$\frac{\sum_{i=1}^n \hat{r}_{ij}^2 \hat{u}_i^2}{SSR_j^2},$$

where \hat{r}_{ij} is the i^{th} residual obtained from the regression of variable x_j on all the other explanatory variables and SSR_j is the summation of the squared

residuals from that regression. White’s standard errors can then be obtained by calculating the square root. The author claims, that these standard errors also account for unknown forms of heteroskedasticity and can be used to calculate heteroskedasticity robust t statistics. Heteroskedasticity robust Wald (or F) statistics may also be calculated (Wooldridge, 2013).

As an alternative to the linear probability model, the probit and logit models may be estimated. According to Wooldridge (2002), the probit model may be specified as

$$P(csr = 1|\mathbf{x}) = \Phi(\beta_0 + \mathbf{x}\boldsymbol{\beta}), \quad (2)$$

where \mathbf{x} has $1 \times k$ dimensions, $\boldsymbol{\beta}$ has $k \times 1$ dimensions and Φ can be written as

$$\Phi(z) \equiv \int_{-\infty}^z \phi(v)dv,$$

where ϕ is the standard normal density,

$$\phi(z) = \frac{1}{\sqrt{2\pi}} \exp\left(-\frac{z^2}{2}\right), \quad z \in \mathbb{R}.$$

Moreover, according to Wooldridge (2002), the logistic regression model can be specified as

$$P(csr = 1|\mathbf{x}) = G(\beta_0 + \mathbf{x}\boldsymbol{\beta}), \quad (3)$$

where G is the logistic function,

$$G(z) = \frac{\exp(z)}{1 + \exp(z)}, \quad z \in \mathbb{R}.$$

Wooldridge (2013) also points out, that in the probit and logit models, as opposed to the linear probability model, the marginal effect of the explanatory variables is no longer constant and the response probability is between 0 and 1.

The probit and logit are based on an unobserved latent variable model. Wooldridge (2013) specifies it as

$$y^* = \beta_0 + \mathbf{x}\boldsymbol{\beta} + e,$$

where y^* is the latent variable and $y = \mathbb{1}[y^* > 0]$, where $\mathbb{1}$ is the indicator function. The author notes, that an important assumption is that e and \mathbf{x}

are independent of each other. Another crucial assumption is that e takes on the logistic distribution for a logit and the standard normal distribution for a probit (Wooldridge, 2013).

The maximum likelihood estimate (MLE) method is used to estimate logistic and probit models (Wooldridge, 2013). Aside from problems connected with endogeneity, other issues related to the estimation of these models are problems with the unobserved, latent variable model. More specifically, as Wooldridge (2002) explains, the non-normality or heteroskedasticity of e mean that the functional form of the response probability is misspecified.

5.2 Tests

Considering that the dependent variable in the linear probability model can be either 1 or 0, normality will most likely be violated in the model. Nevertheless, one can test for normality using the Jarque-Bera Test. Jarque and Bera (1987) calculate the test statistic for the normality of disturbances as

$$n \left(\frac{(\sqrt{\hat{b}_1})^2}{6} + \frac{(\hat{b}_2 - 3)^2}{24} \right),$$

where $\hat{b}_1 = \hat{\mu}_3^2/\hat{\mu}_2^3$, $\hat{b}_2 = \hat{\mu}_4/\hat{\mu}_2^2$ and where $\hat{\mu}_j = \sum_{i=1}^n \hat{u}_i^j/n$ and \hat{u}_i are residuals from the regression. Under the null hypothesis of normality, the test statistic has asymptotic χ_2^2 distribution (Jarque & Bera, 1987).

Moreover, since the regular F test is not valid for the linear probability model, restrictions can be tested using a robust version of the test. One possibility is to calculate the robust Wald statistics (Wooldridge, 2013) and use the robust Wald Test. For the probit and logit models, the Likelihood Ratio Test can also be used to test restrictions. Wooldridge (2013) specifies the test statistic as

$$LR = 2(\log L_{ur} - \log L_r),$$

where $\log L_{ur}$ is the log likelihood of the unrestricted model and $\log L_r$ is the log likelihood of the restricted model. Under the null hypothesis, $LR \stackrel{a}{\sim} \chi_q^2$, where q are the number of restrictions (Wooldridge, 2013).

In Section 4.3, the strong correlation among some of the explanatory variables is discussed. This issue of multicollinearity can pose a problem for proper model estimation. Although it does not violate the main regression assumptions, to precisely estimate a model, it may be better if the explanatory variables are not strongly correlated with each other (Wooldridge, 2013). There, however, exist approaches that help identify the extent of multicollinearity. One such approach is the calculation of the variance inflation factor (VIF). According to Wooldridge (2013), for coefficient j the VIF can be specified as

$$VIF_j = \frac{1}{1 - R_j^2},$$

where R_j^2 is the R^2 from the regression of variable x_j on all the other explanatory variables. Usually, when the VIF for a coefficient is larger than 10, one can suspect multicollinearity to create issues in the estimation (Wooldridge, 2013). The VIF can then be further generalized, so that it can also be used for generalized linear models (Fox & Weisberg, 2011).

5.3 Evaluation Measures

The R^2 and adjusted R^2 can be used to show the goodness-of-fit for the linear probability model. According to Wooldridge (2013) the R^2 and the adjusted R^2 , respectively, can be calculated as

$$R^2 = 1 - \frac{SSR}{SST},$$

$$\bar{R}^2 = 1 - \frac{\frac{SSR}{n-k-1}}{\frac{SST}{n-1}},$$

where SSR is the sum of squared residuals and SST is the total sum of squares. Both measures may be used to evaluate how well the dependent variable is explained, however the adjusted R^2 also accounts for the number of explanatory variables used in the model (Wooldridge, 2013).

To evaluate the probit and logit models, several evaluation measures can be used. Firstly, the regular R^2 measure does not work for the probit and logistic models. Instead, log likelihood, McFadden's R^2 as well as Akaike and Bayesian information criteria may be considered. Wooldridge (2013)

calculates log likelihood as

$$\log L = \sum_{i=1}^n y_i \log [G(\mathbf{x}_i\boldsymbol{\beta})] + (1 - y_i) \log [1 - G(\mathbf{x}_i\boldsymbol{\beta})],$$

where G is the logistic function or the standard normal cumulative distribution function for the logit and probit, respectively. This measure should be maximized (Wooldridge, 2013). Another goodness-of-fit measure is McFadden's R^2 . Wooldridge (2013) specifies it as

$$McFadden R^2 = 1 - \frac{\log L_{ur}}{\log L_0},$$

where $\log L_{ur}$ is the log likelihood of the model and $\log L_0$ is the log likelihood of the base model, including only the constant term. The larger the McFadden's R^2 is, the better is the variation in the data explained (Wooldridge, 2013).

Other possible evaluation measures for the probit and logit models are the Akaike and Bayesian information criteria. Akaike (1974) computes the Akaike information criterion (AIC) as

$$AIC = -2 \log L + 2k,$$

where k is the number of parameters and $\log L$ is the log likelihood. Additionally, proposed by Schwarz (1978), the Schwarz or Bayesian information criterion (BIC) is similar to the AIC, but it favors models with a smaller number of explanatory variables more. When comparing between models, the one with the lower information criteria would be favored. Moreover, accuracy, or the percentage correctly predicted, may also be consulted. According to Wooldridge (2002), it can be computed as

$$Accuracy = \frac{\text{number of correct predictions}}{\text{number of total predictions}}.$$

Naturally, the higher the accuracy is, the better a model performs. This measure can be applied to the probit and logit as well as to the linear probability model.

6 Results

6.1 Linear Probability Model

Firstly, the linear probability model using all the explanatory variables is estimated. White’s heteroskedasticity robust standard errors are used. The results of this baseline regression can be found in Table A2 in the Appendix. The Jarque-Bera Test for normality is also carried out. The test statistic is calculated to be 251.07 with a p-value less than 0.001. The null-hypothesis of normality is thus rejected. As discussed in Section 5.1, since the number of observations is 220, testing the significance of individual variables can still be undertaken. The VIF is also calculated. The variables *operating_rev*, *ebit*, *net_profit* and *bookvalue* obtained values greater than 10.

Considering that VIF values greater than 10 can be viewed as problematic for estimating coefficients (Wooldridge, 2013), it may be beneficial to exclude some of the highly correlated, financial variables. We performed all of the feasible exclusions. Considering the R^2 , adjusted R^2 , accuracy as well as the significance and interpretability of the variables, a model was eventually chosen. This selected model is shown in Table 4.

Table 4: Linear Probability Model

	LPM
furniture	−0.062 (0.139)
fuel	−0.099 (0.128)
comp	−0.046 (0.186)
leisure	−0.131 (0.135)
non_special	−0.045 (0.134)
non_store	0.077 (0.148)
other_special	−0.065

	(0.133)
prague	0.073
	(0.041)
lle	-0.005
	(0.086)
plc	0.077
	(0.103)
age_incorp	0.004*
	(0.002)
operating_rev	-0.000
	(0.00001)
net_debt	0.0001***
	(0.00003)
net_profit	0.002***
	(0.0004)
roa	0.363**
	(0.133)
roce	0.009
	(0.006)
asset_turnover	0.001
	(0.005)
Constant	-0.005
	(0.180)
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R ²	0.378
Adjusted R ²	0.326
Accuracy	0.914
<hr/>	
<i>Note:</i> * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$	

The dependent variable is *csr*. LPM contains *net_profit* and *operating_rev* as the combination of the highly correlated, financial explanatory variables. White's standard errors are reported and will be used throughout the analysis for all linear probability models. Moreover, out of all the estimated linear probability models, LPM obtained the highest values for accuracy, R² and the adjusted R². The VIF was calculated for LPM, as well, and all of the included variables had the VIF smaller than 10. Multicollinearity should

then not pose a problem in the estimation of the model.

As shown by Table 4, out of the financial variables, *net_debt*, *net_profit* and *roa* are found to be significantly and positively related with the probability of CSR effort disclosure. Other financial variables, such as *operating_rev*, *roce* or *asset_turnover*, are found to be insignificant. Additionally, the variable *age_incorp* is also significant with a positive association to the probability of CSR effort disclosure. All of the other structural explanatory variables have an insignificant association with the probability of firm CSR effort reporting. This includes factors, such as the membership in specific sub-sectors, the legal form of a firm and its headquarters located in Prague.

The sub-sector dummy variables are all found to be individually insignificant. We can also check for their joint significance by testing their restrictions. The robust Wald Test is carried out. The p-value of the test is larger than 0.05. We thus cannot reject joint insignificance of the sub-sector dummy variables in this model.

6.2 Probit

The baseline regression with all the explanatory variables was estimated for the probit model. The results of this regression are shown in Table A2 in the Appendix. As multicollinearity can pose a problem also for probit models, a generalized version of the VIF, which can also be used for generalized linear models (Fox & Weisberg, 2011), was calculated. The highly correlated, financial variables again obtained values greater than 10. Following the procedure as in the case of the linear probability model, feasible exclusions of these variables were tried. A model was eventually chosen based on its accuracy, AIC, BIC, McFadden R^2 , log likelihood as well as variable significance and interpretability. Table 5 summarizes the results. Out of the highly correlated independent variables, Probit includes only *ebit*. Moreover, as the VIFs for all of the included variables are below 10, multicollinearity should not be an issue in this model.

Table 5: Probit Model

	Probit
furniture	−0.497 (0.811)
fuel	−2.160 (2.780)
comp	−0.251 (0.942)
leisure	−1.902 (1.676)
non_special	−0.374 (0.803)
non_store	0.225 (0.778)
other_special	−0.620 (0.769)
prague	0.262 (0.347)
llc	−0.461 (0.660)
plc	0.117 (0.715)
age_incorp	0.018 (0.018)
net_debt	−0.0002 (0.0003)
ebit	0.014*** (0.004)
roa	2.206 (1.224)
roce	0.686 (0.453)
asset_turnover	−0.034 (0.071)
Constant	−1.573 (1.263)

Log Likelihood	-46.801
AIC	125.602
BIC	179.900
McFadden R ²	0.477
Accuracy	0.918

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

As depicted by Table 5, out of all the explanatory variables only the financial variable *ebit* is significant. Moreover, it is estimated to have a positive relationship with the probability of CSR effort disclosure. All the other variables, both structural and financial, remain individually insignificant. Similarly to the case with the linear probability model, we can test for the joint insignificance of the dummy sub-sector variables. The Likelihood Ratio Test may be used to test these restrictions. The test was carried out and with a p-value that is greater than 0.05, we cannot reject joint insignificance of these binary variables.

6.3 Logit

The baseline logistic model with all of the independent variables was estimated. Its results can be found in Table A2 in the Appendix. Similarly to the probit case, multicollinearity was checked for using the VIF, available also for generalized linear models (Fox & Weisberg, 2011). The highly correlated, financial independent variables were found to have VIFs larger than 10. Feasible exclusions were then estimated and based on the log likelihood, McFadden R², AIC, BIC, accuracy, variable significance as well as interpretability, a model was chosen. Table 6 presents the results.

Table 6: Logit Model

	Logit
furniture	-0.883 (1.552)
fuel	-4.456 (5.043)

comp	−0.245 (1.745)
leisure	−3.550 (3.464)
non_special	−0.413 (1.496)
non_store	0.644 (1.440)
other_special	−0.998 (1.439)
prague	0.344 (0.662)
llc	−0.916 (1.203)
plc	0.212 (1.292)
age_incorp	0.028 (0.033)
net_debt	−0.0005 (0.001)
ebit	0.026** (0.008)
roa	3.742 (2.356)
roce	1.231 (0.880)
asset_turnover	−0.056 (0.134)
Constant	−2.735 (2.326)
<hr/>	
Log Likelihood	−47.346
AIC	126.692
BIC	180.990
McFadden R ²	0.471
Accuracy	0.914
<hr/>	

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Out of the highly correlated independent variables, Logit contains only the variable *ebit*. We thus have the same set of variables in the Probit and Logit models. Furthermore, as the VIFs for the included variables are all below 10, the multicollinearity complications are not present in the estimation anymore.

Out of all of the explanatory variables, only *ebit* is found to be significant with a positive relation to the probability of CSR effort reporting. All of the other explanatory variables remain insignificant. Following our procedure in the cases of the linear probability model as well as the probit model, we may check for the joint insignificance of the sub-sector binary variables. The Likelihood Ratio Test was carried out and with a p-value, that is greater than 0.05, we cannot reject joint insignificance of the binary sub-sector variables.

6.4 Comparison of Models

Three of the best performing models were discussed. The LPM and Logit have the same accuracy of 0.914. The highest accuracy was achieved by the Probit. Probit also has a slightly larger log likelihood and McFadden R^2 as well as smaller AIC and BIC measures, when compared to the Logit. With this regard, the Probit is indicated to have enhanced performance.

Significant variables from all of the discussed models are summarized by Table 7. Out of the structural variables only the variable *age_incorp* was

Table 7: Significant Variables and their Signs

Variable	LPM	Probit	Logit
<i>age_incorp</i>	+		
<i>net_debt</i>	+		
<i>net_profit</i>	+	×	×
<i>ebit</i>	×	+	+
<i>roa</i>	+		

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

+ positive sign

× not included in the model

found to be significant. It, moreover, is found to have a positive relationship with the probability of CSR effort disclosure. However, this holds only in the LPM. Other structural variables, such as the legal forms of the firms, headquarters in Prague or the sub-sector binary variables, remained insignificant in all of the models. Additionally, in all of the models, the sub-sector variables were found to not only be individually, but also jointly insignificant.

Out of the financial variables, *net_debt*, *net_profit*, *ebit* and *roa* are found to be significant, as shown by Table 7. Net debt is found to be significant with a positive association to the probability of CSR effort disclosure only in the LPM. The same holds for the variable *roa*. Net profit is significant and positively related to the probability of CSR effort disclosure only in the LPM. However, it is important to note, that it was not included in the Probit or Logit. Furthermore, EBIT, which is included in the Probit and Logit, is also found to have a significant, positive relationship with the probability of CSR effort reporting. Other financial variables are found to be insignificant in all of the models.

Although the Probit and Logit include the same set of explanatory variables, the LPM uses a different one. With this regard, it may be interesting to observe the results of the models for both combinations of the explanatory variables. Probit and logit models were estimated with the same set of independent variables as used in the LPM, so with the highly correlated, financial variables *net_profit* and *operating_rev*. However, in these two regressions, the VIF value for the variable *operating_rev* was above 10. Hence, there may be issues with multicollinearity in the estimation of the parameters. The results of these two models are nevertheless presented in Table A3 in the Appendix.

The linear probability model may also be estimated using the variables included in the Logit and Probit. The results of this regression can be found in Table A4 in the Appendix. The VIF values for this regression were all below 10, hence multicollinearity should not be an issue in model estimation. The accuracy of both LPM and LPM 2, the model with the

same set of variables as the Logit and Probit, are the same. LPM performs better in terms of the R^2 and the adjusted R^2 . Table 8 summarizes the results of models LPM 2, Probit and Logit.

Table 8: Summary of LPM 2, Probit and Logit

Variable	LPM 2	Probit	Logit
<i>age_incorp</i>	+		
<i>ebit</i>	+	+	+
<i>roa</i>	+		

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

+ positive sign

Given the same set of explanatory variables, although the Probit and Logit only give significance to EBIT, LPM 2 finds that also age since incorporation and ROA are significant. All of the variables are found to have a positive relationship with the probability of firm CSR effort disclosure. Moreover, EBIT is the only variable that is significant in all of the three models, as presented by Table 8.

Altogether, we find evidence that the financial performance, namely the profitability, of a firm is related with its probability of CSR effort disclosure. We thus have some evidence that supports our hypothesis that factors, such as EBIT, net profit and ROA are positively related with the probability of firm CSR disclosure. There is also some evidence that firm age since incorporation may have a significant and positive association with the probability of firm CSR effort reporting. Although Roberts (1992) uses the change in ROE instead of ROA, the author also finds a positive relationship between the financial variable and CSR disclosure. Our results then support the finding of Roberts (1992) that the economic performance of a firm is positively related to its CSR reporting. Additionally, our findings, that EBIT, net profit and ROA are significant with a positive relation to CSR disclosure, are in line with the findings of Lu and Abeysekera (2014), who report that firm profitability is related to company CSR disclosure.

Moreover, in contrast with the findings of Sommer et al. (2014), who

discover that indebtedness is not a significant factor for firm CSR effort disclosure, we do find some evidence in favor of the importance of the debt levels of a firm. We thus have some evidence that supports the hypothesis that net debt will be positively associated with the probability of CSR disclosure.

Other independent financial variables are found to be individually insignificant. Moreover, the variable *bookvalue*, which is one of the correlated, financial variables, was not included in any of the chosen, best performing models. The finding that operating revenue, which can be an indicator of size, is not significant in the LPM, is in contrast with the results of Dyduch and Krasodomska (2017), who document a significant relationship between CSR reporting and turnover, as a measure of company size. Our findings are also in contrast with Sommer et al. (2014), who also report size to be an important factor.

Additionally, the sub-sector variables are found to be individually and jointly insignificant. This could be a discrepancy with the discoveries of some authors, such as Dyduch and Krasodomska (2017) and Lu and Abeysekera (2014), who document the importance of different industries. However, it is important to note, that we have only considered sub-sectors, so specific retailing specializations and not entire industries, as we are investigating the determinants of CSR effort disclosure only for the retail trade industry.

6.5 Limitations

Limitations of the analysis could be improved by including different variables, increasing sample size, using different models or creating a training and testing set for model training and evaluation. Other limitations include our definition of the dependent variable *csr* and the classification of firms into CSR reporting or not CSR reporting.

Interesting variables for data gathering could be pertaining to the firm ownership structures. For example, the impact of foreign ownership or foreign capital share could be studied. The results could be of interest as Utgård

(2018) as well as Dyduch and Krasodomska (2017), respectively, report the importance of these variables. Utgård (2018) also reports the significance of vertical integration and the usage of private brands. These may be other factors to consider. The influence of shareholders may also be analyzed. One may observe board characteristics, following Eberhardt-Toth (2017), or ownership dispersion, such as Gamerschlag et al. (2011). In our investigation, such characteristics were not measured due to data availability issues.

Moreover, other important aspects to include may be past variables. With this regard, our models may suffer from omitted variable problems. Past financial variables may be related to the current financial performance. Moreover, past financial performance may also be related to the current firm CSR effort disclosure, as documented by Roberts (1992). Hence, these variables could also be included and a fixed effects model could be estimated. Another aspect to consider may be past CSR effort. Firms, which started with CSR and began reporting their efforts, may be more likely to continue doing so. Past CSR effort disclosure may also have an impact on future financial performance as reported by Dimson et al. (2012). Hence, this is another important factor to consider.

Other models could also be used to estimate the relationship between CSR effort disclosure and its determinants. For example, the weighted least squares could also be estimated. Moreover, fixed effects models could also be used with panel data. Furthermore, it could also be beneficial to gather more observations, separate the data into a training and testing set, then train the models on the training set and test their performance on the testing set. This could limit over fitting and lead to an improved evaluation of model performance.

It may also be worthwhile to note, that we are not examining the determinants of starting CSR reporting. To analyze the determinants of the initial choice to disclose CSR different methods should be used. For example, ideally one would observe the CSR disclosure over a time horizon. There would be some firms in the sample, which initially do not report CSR

efforts, but then start disclosing some projects. Some firms in the sample would not disclose corporate social responsibility at all. One could then examine, whether there exist certain characteristics that are related with the choice of CSR. This is, however, not the aim of the thesis.

Furthermore, in our measurement of CSR effort disclosure, we are assuming that companies, which undertake CSR also report these efforts on their web sites. We assume that firms face incentives that motivate them to disclose their efforts and build relationships with the public as potential customers. It is thus important to emphasize that we are measuring the presence of the web-based CSR effort disclosure, not the CSR undertakings per se.

Moreover, we have only consulted the web sites of the companies. Firms may report their CSR efforts through different mediums, as well. Further studies may also examine other forms of disclosure, such as separate company reports or use information from annual financial reports of firms. With this regard, it may then be important to also take into consideration accounting standards and practices. Additionally, we are also discriminating CSR effort. As described in Section 4.2, evidence of CSR activities, such as attained certifications or specific projects are classified as corporate social responsibility efforts. This evidence has to be shown for CSR effort to be considered as disclosed. A vague statement without concrete proof is not classified as CSR effort disclosure. Finally, we do not measure the levels or amount of corporate social responsibility and thus do not obtain any ratings of CSR. This, however, can be an interesting extension for further research.

7 Conclusion

Corporate social responsibility is an important, enthralling concept in modern business. Firms may undertake CSR activities to create and strengthen relationships with their stakeholders. With this respect, the retail trade sector may be an interesting area for research, as an important stakeholder for retailing firms are consumers. Firms operating in retail thus have incentives to make disclosure of their CSR efforts available to the wide public, as they aim to nurture relationships with potential customers.

Furthermore, the corporate social responsibility environment within the Czech Republic has been examined only sparsely in several previous papers. There is thus ample room for more research in the field and this thesis presents new insights about the determinants of CSR effort reporting. We thus investigate the determinants of web-based CSR effort disclosure for firms in the retail trade sector in the Czech Republic.

The linear probability model, probit and logit are used in the analysis with a set of financial, legal, organizational as well as sub-sector explanatory variables. The response probability of disclosing CSR effort is hence estimated. Model performance is examined based on evaluation measures, such as the Akaike and Bayesian information criteria, log likelihoods, accuracy, McFadden's R^2 , R^2 or the adjusted R^2 .

We find evidence that EBIT is positively related to the probability of CSR effort disclosure. There is also some evidence that net profit, net debt and ROA are all positively associated with the probability of CSR effort disclosure. Moreover, we also find some evidence that the age of a firm since its incorporation is significantly and positively related with firm CSR effort reporting.

Furthermore, other financial variables, such as operating revenue, which can account for firm size, are found to be insignificant. Additionally, aside from firm age, other structural firm variables are found to be insignificant. These include aspects such as the legal form of a firm or having headquarters in Prague. Firm specialization in various retail sub-sectors is also found to

be both individually as well as jointly insignificant.

Further research may include examining sectors other than retail trade. Additional studies may also want to investigate the determinants of beginning CSR engagement and find out whether there are certain firm characteristics that make it more likely to start reporting CSR effort. Financial variables from previous years or past disclosure of CSR effort may also be of interest. Further studies could then gather panel data and use different models, such as fixed effects to estimate the relationships. Perhaps other research may want to concentrate on the impact of CSR in the Czech Republic. One may thus measure the effect of CSR engagement on future firm performance. Moreover, other models may also be estimated and evaluated. Possible approaches include regression models, such as weighted least squares, or even other methods, such as decision trees or random forests.

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Appendix

Table A1: CZ-NACE Retail Trade Classification (Czech Statistical Office, 2017)

Classification	Explanation
Retail sale in non-specialized stores	The selling of a wide range of goods in one location, such as supermarkets or department stores
Retail sale of food, beverage or tobacco in specialized stores	The selling of food, beverage or tobacco in specialized shops
Retail sale of automotive fuels in specialized stores	The selling of fuel for motor vehicles and motorcycles
Retail sale of computer and communication equipment in specialized stores	The selling of information and communications technology (ICT) equipment, such as computers, telecommunication devices and consumer electronics
Retail sale of other household goods in specialized stores	The selling of other household goods in specialized shops, such as textiles, carpets, furniture or electric appliances
Retail sale of cultural or recreational goods in specialized stores	The selling of cultural or recreational goods, such as books, newspapers, sports equipment, games or toys, in specialized shops
Retail sale of other goods in specialized stores	The selling of other types of goods, not mentioned above, such as clothing, shoes, pharmaceuticals, jewelry or flowers
Retail sale not carried out in stores, stalls or market places	The selling of goods through the internet, door-to-door selling, vending machines and other forms of selling not taking place in stores, stalls or market places

Table A2: Baseline Models

	Baseline LPM	Baseline Probit	Baseline Logit
furniture	-0.064 (0.137)	-0.627 (0.874)	-1.149 (1.756)
fuel	-0.093 (0.128)	-5.618 (5.843)	-11.204 (11.493)
comp	-0.040 (0.186)	-0.346 (0.994)	-0.172 (1.857)
leisure	-0.135 (0.135)	-1.286 (1.133)	-2.041 (2.179)
non_special	-0.041 (0.134)	-0.358 (0.842)	-0.133 (1.621)
non_store	0.080 (0.148)	0.126 (0.821)	0.670 (1.567)
other_special	-0.060 (0.134)	-0.652 (0.807)	-0.848 (1.562)
prague	0.067 (0.042)	0.141 (0.369)	0.104 (0.714)
llc	0.017 (0.086)	-0.613 (0.878)	-1.221 (1.679)
plc	0.099 (0.104)	-0.125 (0.935)	-0.248 (1.779)
age_incorp	0.005* (0.002)	0.009 (0.022)	0.009 (0.043)
operating_rev	-0.00001 (0.00001)	0.0003 (0.0005)	0.001 (0.001)
net_debt	0.0002* (0.0001)	-0.002 (0.001)	-0.004 (0.002)
ebit	0.0004 (0.002)	0.029 (0.020)	0.057 (0.037)
net_profit	0.002 (0.003)	-0.023 (0.019)	-0.046 (0.035)
roa	0.357** (0.132)	2.742* (1.377)	4.783 (2.715)
roce	0.008 (0.006)	0.692 (0.479)	1.224 (0.946)

asset_turnover	0.002 (0.006)	-0.063 (0.086)	-0.103 (0.164)
bookvalue	0.0001 (0.0001)	0.0002 (0.001)	0.001 (0.002)
Constant	-0.039 (0.184)	-1.257 (1.549)	-2.364 (2.993)
<hr/>			
R ²	0.381		
Adjusted R ²	0.322		
Log Likelihood		-44.823	-45.021
AIC		127.646	128.043
BIC		192.125	192.521
McFadden R ²		0.499	0.497
Accuracy	0.914	0.905	0.914
<hr/>			

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A3: Probit and Logit Models with Variables Used in LPM

	Probit 2	Logit 2
furniture	-0.530 (0.852)	-0.781 (1.671)
fuel	-8.981 (5.115)	-19.386 (10.180)
comp	-0.524 (0.995)	-0.508 (1.839)
leisure	-1.756 (1.370)	-3.135 (2.829)
non_special	-0.392 (0.851)	-0.150 (1.639)
non_store	0.201 (0.823)	0.882 (1.570)
other_special	-0.629 (0.812)	-0.630 (1.565)
prague	0.272 (0.347)	0.399 (0.657)
llc	-0.571 (0.718)	-1.010 (1.338)
plc	-0.129 (0.766)	-0.073 (1.422)
age_incorp	0.009 (0.019)	0.012 (0.035)
operating_rev	0.001 (0.0003)	0.001* (0.001)
net_debt	-0.001 (0.001)	-0.002 (0.001)
net_profit	0.004 (0.007)	0.005 (0.014)
roa	3.144* (1.309)	5.618* (2.580)
roce	0.774 (0.460)	1.336 (0.903)
asset_turnover	-0.084 (0.081)	-0.149 (0.159)

Constant	-1.284 (1.352)	-2.679 (2.592)
Log Likelihood	-46.060	-46.343
AIC	126.120	126.685
BIC	183.811	184.377
McFadden R ²	0.485	0.482
Accuracy	0.900	0.914

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A4: Linear Probability Model with Variables Used in Probit and Logit

LPM 2	
furniture	−0.069 (0.139)
fuel	−0.110 (0.128)
comp	−0.056 (0.186)
leisure	−0.122 (0.140)
non_special	−0.052 (0.134)
non_store	0.065 (0.148)
other_special	−0.073 (0.134)
prague	0.078 (0.041)
llc	0.004 (0.087)
plc	0.081 (0.103)
age_incorp	0.004* (0.002)
net_debt	0.00004 (0.00003)
ebit	0.001*** (0.0002)
roa	0.388** (0.138)
roce	0.009 (0.006)
asset_turnover	−0.0004 (0.005)
Constant	−0.007 (0.179)

R ²	0.371
Adjusted R ²	0.321
Accuracy	0.914

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$