IDENTIFICATION OF AUDITOR’S REPORT QUALIFICATIONS:
AN EMPIRICAL ANALYSIS FOR SLOVENIA

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IDENTIFICATION OF AUDITOR’S REPORT QUALIFICATIONS: AN EMPIRICAL ANALYSIS FOR SLOVENIA

Abstract
An auditor’s report qualifies a company’s financial statements if the management’s representation of the company’s financial affairs is not in accordance with nationally generally accepted accounting pronouncements. The present research studies the qualification of auditors’ reports in relation to the circumstances in the company’s economic situation that lead to the qualification. Qualifications have been analysed on a sample of 293 large Slovenian companies. The results reveal that companies with qualified auditors’ reports have high indebtedness, low liquidity, low efficiency and poor profitability in comparison to companies with unqualified auditors’ reports. From a statistical viewpoint, a logistic model can distinguish between companies that received a qualified auditor’s report and companies that received an unqualified auditor’s report on a sample of Slovenian large companies.

Key words: auditor’s report, qualified report, identification, audit model, Slovenia.

JEL classification: M41.

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1 Introduction

Management represents a company’s financial position and its achievements in the company’s financial statements (in accordance with nationally generally accepted accounting principles). The auditor (note: a certified auditor) examines the company’s financial statements and prepares the auditor’s report. The auditor asserts whether the company’s financial statement representation is true and fair in accordance with the nationally accepted accounting framework. Therefore, for many years, the information contained in the auditor’s report has been of interest to the public, various financial statements users (practitioners, i.e., investors, lenders, other creditors, etc.), and academia. The financial crisis from 2009 onwards additionally increased (political) interest in the information contained in auditors’ reports and exposed these reports to various criticisms (i.e., the inadequacy of the auditor’s assurance, auditing procedures, etc.).

Nevertheless, there does not exist (at least to the best of our knowledge) many previous empirical studies of auditors’ reports or of auditors’ opinions in European countries. In Europe, there are only a few empirical studies that reveal data about the auditor’s report information (for a large population of companies in a country) (see, i.e., Keasey et al., 1988; Laitinen and Laitinen, 1998; Spathis et al., 2003; Farrugia and Baldacchino, 2005; Pasiouras et al., 2007). For countries in the southeastern region of Europe (except for Greece), to the best of our knowledge, no such empirical study exists. For Slovenia, there is no (publicly available) information on auditor’s report information because no previous study has been conducted to analyse auditor’s report information in Slovenia.

The auditor’s report and the information it contains have been in the limelight in Slovenia recently because of various business failures of companies that had audited financial statements. Therefore, in Slovenia, the public (especially the media) has been consistent in their belief and their demand that qualified auditors’ reports (especially when containing a qualified auditor’s opinion about the company’s financial statements) should be regarded as warning signal of business failure (i.e., bankruptcy) and/or other irregularities that appear when conducting business (i.e., business fraud). The public and other users of the auditor’s report and/or financial statements need to identify untrue and unfair financial statements. It is not known whether identification of the qualification of an auditor’s report is possible with the use of various company ratios from the financial statements of Slovenian companies. The existence of increased interest (demand) and the absence of previous studies on auditor’s report information in Slovenia motivated us to consider the Slovenian case.

The general purpose of the present study is to analyse the qualified auditors’ reports of Slovenian companies and to show the circumstances in the company’s economic situation that lead to the qualification of auditor’s reports.
The sample data includes listed and unlisted companies. In previous empirical studies, several statistical models were developed to explain the qualifications in auditors’ reports (see, i.e., Bell and Tabor, 1991; Krishnan and Krishnan, 1996; Spathis et al., 2003; Gaganis et al., 2007). The object of this study is to develop a statistical logistic model that considers various company accounting ratios to explain the qualifications in auditors’ reports of Slovenian companies. Company’s accounting ratios are limited to those that are publicly available and accessible through various financial databases. The logistic model provides the likelihood of a qualifying auditor’s report for a company with given accounting ratios. The statistical model developed can be used to assess the extent to which the qualification of auditors’ reports could be expected based on publicly available data from the company’s financial statements (compare, i.e., with Dupoch et al., 1987). Furthermore, the developed statistical model can be used by auditors as a tool to aid them in determining the scope of the audit for existing clients, in peer reviews, as a decision aid when predicting what report other auditors would issue in similar circumstances, etc. (Bell, 1997; Laitinen and Laitinen, 1998). And additionally, the developed statistical model can be used by regulator and auditing supervision agency/organization when conducting auditing supervision and by anyone else, i.e., lenders, in their ad hoc analysis of auditee. Agencies that publish company’s financial data can use the model to add new variable to their existing company’s publicly available data (i.e. variable that shows the probability that company receives auditor’s report that is qualified). And lastly, academia/researchers can use the model results as new variable in their studies (i.e., as proxy for audit quality).

The remainder of the paper is organised as follows. Chapter two briefly introduces reasons for usage of auditor’s report identification model. Chapter three presents sample data, and chapter four presents the variable selection. The results and an analysis of results are provided in chapter five, including a discussion of the results. Chapter six summarises our research findings.

2 Reasons for usage of auditor’s report identification model

As previously stated, the object of this study is to develop a statistical logistic model to explain the qualifications in auditors’ reports. Various authors (see, i.e., Laitinen and Laitinen, 1998; Spathis et al., 2003; Gaganis et al., 2007) give a glimpsed presentation of previous research in the field of auditors’ reports qualification using various statistical approaches/techniques (note: Carson et al. (2013) give extant presentation of previous research in the field of auditors going concern opinion qualification). There has long been an interest from practitioners (i.e., investors, lenders, other creditors and other various financial statement users), the public and the academic community in the existence of an auditor’s report identification model (see, i.e., Dupoch et al., 1987; Keasey et
al., 1988; Krishnan and Krishnan, 1996; Laitinen and Laitinen, 1998, etc.). As objective of this study is stated, it is an empirical question answer is sought to (note: therefore there is no need to present hypothesis development). Aforementioned interest has increased in recent years for various reasons (i.e., the on-going financial crisis from 2009 onwards, the existence of an array of novel methodological approaches, etc.). Various statistical approaches (i.e., different regression modelling techniques) have been used to identify the companies that should receive a qualified auditor’s report or opinion according to their reported financial statements’ other disclosures (see, i.e., Keasey et al., 1988; Laitinen and Laitinen, 1998; Spathis et al., 2003; Gaganis et al., 2007). These researchers used various variables, i.e., financial and non-financial variables, non-market and market variables, publicly available and unavailable data for the variable calculation, etc. The first reason for the development of the auditor’s report identification model includes the auditors’ growing burdens: the enormous amount of data to be processed, the scope of the audit work, time and cost constraints, etc. The second reason for model development includes the auditors' need for tools that can objectively guarantee the data about the company being audited (Bazerman et al., 2002; Koskivaara, 2004). An empirical model with the ability to identify the qualified auditor’s report can be used to assess the extent to which qualification could be expected on publicly available data (Dupoch et al., 1987). The output of this identification model can be used in planning specific auditing procedures that can be applied to achieve an acceptable level of audit risk (Bell and Tabor, 1991; for more on the usefulness of the developed model, see Bell, 1997). Furthermore, the developed model can be used by auditors as a tool to aid them in the review of their audit work or the work of their peers when evaluating potential clients, as a defence in law suits, etc. (Laitinen and Laitinen, 1998).

As stated, auditors can use auditor’s report identification model as a supplementary auditing tool (i.e., to adjust audit risk and audit sampling) and as a monitoring tool. Furthermore, the model can be used by regulator and auditing supervision agency/organization as their “surveillance” supplementary tool when conducting auditing supervision. The model can be used by anyone else, i.e., lenders, in their ad hoc analysis of auditee. Agencies that publish company’s financial data can use the model to add new variable to their publicly available data (i.e., variable that shows the probability that company receives auditor’s report that is qualified). And lastly, academia/researchers can use the model results as new variable in their studies (i.e., as proxy for audit quality).
3 Sample data

Slovene legal pronouncements require all limited companies to have their annual financial statements, with the various accompanying disclosures to these statements, audited (see Article 57/1 of the Companies Act, CA-1, in Slovene: ZGD-1). In accordance with the Companies Act (CA-1), the company must appoint an auditor (note: a certified auditor) to conduct an audit of the company’s financial statements.\(^1\) The appointed auditor must prepare an auditor’s report on the company’s financial statements. In the auditor’s report, the auditor expresses an opinion regarding the accuracy and fairness of the company's presented financial statements (i.e., is the company’s financial representation true and fair). In the present study, if an auditor assures in the auditor’s report that the financial representation of a company’s financial statements is true and fair, the auditor’s report is classified as unqualified. The auditor’s report is otherwise classified as qualified.\(^2\)

Sample data were retrieved from a database of Slovenian companies. Sample data (including auditors’ reports) were hand-collected from the annual reports of companies (published in 2010, for the year 2009) that have their headquarters in Slovenia and that can be defined as large\(^3\). These are data on a select group of companies, which do not represent a group of companies and are large companies. Furthermore, these data are on companies that, in accordance with Article 58 of the Companies Act (CA-1), filed their annual report and an auditor’s report on

\(^{1}\) In accordance with the Companies Act (CA-1) and the Auditing Act (AA-2, in Slovene: ZRev-2), an auditor that is appointed to conduct an audit must examine the annual report, the company’s financial statements and the administration of the company to the extent required by generally accepted auditing standards. These standards are in accordance with the Slovene Auditing Act (AA-2) International Standards on Auditing (ISA).

\(^{2}\) In the present study, the auditor's report is not classified as qualified when it includes additional auditors’ remarks or supplementary information aside from the auditor’s assurance that the financial representation of the company’s financial statements is true and fair (i.e., additional emphasis of matter paragraphs, explanatory paragraphs or other matter paragraphs in accordance with ISA). Mareque et al. (2015) give more in detail pronouncements regarding auditor’s report and auditor’s opinion for Spain. Auditor’s report and auditor’s opinion in Slovenia are the same as auditor’s report and auditor’s opinion in Spain.

\(^{3}\) In accordance with Article 55 of the Companies Act (CA-1), large companies fulfil at least two criteria out of the following: 1) they have over 250 employees, 2) they have over € 8.8 million in net turnover from sales in the financial year and/or 3) they have assets of at least € 17.5 million. The companies that are large according to other (qualitative) measures from Article 55 of the CA-1 (banks, insurance companies, etc.) but not according to quantitative criteria defined by Paragraph 5 of Article 55 of the CA-1 are not regarded as large in this study. The data on the companies were acquired from the GVIN.com database.
their company’s financial statements. According to the criteria of Paragraph 5 from Article 55 of the CA-1, there were 295 large companies in Slovenia on 31 December 2009. Out of the 295 companies, two companies did not have an annual report at our disposal. In total, the sample is comprised of 293 large companies. The results of the hand-collected data from the annual reports in this sample of 293 examined companies show that there are 281 companies that have an unqualified auditor’s report, while the remaining 12 companies have a qualified auditor’s report. An auditor’s report is qualified if the auditor’s opinion of the company’s financial statements is qualified. Out of the 12 examined companies with a qualified auditor’s report, one company had an adverse auditor’s opinion, while the remaining 11 companies had a qualified auditor’s opinion. The auditor’s opinions were qualified because of the non-compliance of the company’s financial statements with the pronouncements that are in force in Slovenia (Slovene Accounting Standards or International Financial Reporting Standards, endorsed by EU). The reasons for the qualification of the auditors’ opinions were as follows (note: the following reasons are interrelated): at least seven times, assets were not properly recognised or valued; at least once, revenues and expenses were not properly recognised; at least once, a change in an accounting policy was not properly disclosed; and at least three times, the auditor could not retrieve enough evidence (i.e., limitation in the scope of the auditor’s work).

The number of qualified auditor’s reports in the sample was 12 out of 293 auditor’s reports. Because our data were from the auditor’s reports for companies for a research period of one year (2009), these twelve qualifications concerned 12 companies. Nevertheless, the data reveal that in Slovenia, the apportionment of unqualified auditors’ reports within all auditors’ reports is large (95.5 per cent). This finding is surprising at first, but various other studies reveal that a large apportionment of unqualified auditors’ reports within all auditors’ reports is not unusual. For example, in their study, Laitinen and Laitinen (1998) reveal that in Finland (for the year 1997) out of over 7,000 companies, 94 per cent had an unqualified auditor’s report. In the United Kingdom in the research period between 1974 and 1975, 92 per cent of 3,000 companies had unqualified auditor’s reports (Firth, 1978, quoted from Farrugia and Baldacchion, 2005). In a later research period between 2000 and 2001

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4 The sample of 293 examined companies is not a small sample but while of these only 12 companies have a qualified auditor’s report there exists a small frequency problem of phenomena in study’s research interest. Therefore, the chance that significant differences create a false positive is increased. Furthermore, because of small frequency problem the chance that important differences will be missed is increased. Additionally, sample of 293 examined auditor’s reports and company’s financial data are limited to only one year (note: adding more years would require additional study of possible auditor’s report/opinion persistency). Regarding all these sample characteristics, there is an increased risk that the study results are inconclusive.
(from April to April), over 99 per cent of 392 companies had unqualified auditor’s reports (Company reporting, 2001, quoted from Farrugia and Baldacchion, 2005). In France, in the research period between 1986 and 1995, over 95 per cent of 8,484 companies had unqualified auditor’s reports (Soltani, 2001, quoted from Farrugia and Baldacchion, 2005). The low apportionment of qualified auditor’s reports within all auditors’ reports was noticed in various other (non-European) countries, i.e., Australia, Singapore, the United States of America, etc. (Farrugia and Baldacchion, 2005). Several reasons exist for the large apportionment of unqualified auditors’ reports within all auditors’ reports (see, i.e., for more details, Laitinen and Laitinen, 1998).

Firstly, auditors may not be adequately competent to identify risks, and therefore the company’s auditor’s report is not qualified. Secondly, auditors may not be completely independent because the auditor may possibly consider the effects of a qualification on his or her business (i.e., the possible loss of clients because of qualifications, etc.). Thirdly, the auditor may additionally not be completely independent because of his or her possible consideration of the effects of a qualification on the prosperity of the audited company’s business. Additionally, a possible explanation for the large apportionment of unqualified auditors’ reports within all auditors’ reports could be that companies’ financial representations are generally true and fair, and there is no need for report qualification.

4 Methodology and variable selection

The list of explanatory variables (note: the majority of these are accounting ratios) is provided in Table 1. These variables are used to identify the auditor’s report qualifications. The majority of variables from the list are used

\[\text{\cite{potocan2012}}\]

There are various reasons for the large apportionment of unqualified auditor’s reports within all auditors’ reports. Various factors can influence the auditor’s decision to qualify the auditor’s report. For example, the research results for Slovenian organisations show that managers use various management approaches and the usage of these is subject to various influences (for more details, see Potocan et al., 2012). It can be conjectured that auditors (as managers of an audit) use various analytical and management approaches during the audit.

\[\text{\cite{keasey1988, laitinen1998, spathis2003, gaganis2007, etc.}}\]

In the first step, a list of fifty different possible explanatory variables was prepared. A strategy that combines expert knowledge and evidence from previously used explanatory variables found in the various studies with an empirical background (see, e.g., Keasey et al., 1988; Laitinen and Laitinen, 1998; Spathis et al., 2003; Gaganis et al., 2007; etc.) was undertaken. The objective of this study is to construct a prediction model using publicly available accounting ratios (note: these ratios can be computed with the use of company’s disclosed financial data). There are many reasons why fifty variables are too numerous (i.e., the impracticability of the developed model, the burdensome task of collecting data on variables, the possible problem of multicollinearity and/or multiple correlation, etc.). Therefore, in the second step, the list of fifty possible
in financial statement analysis (see, i.e., Wild et al., 2003; Brigham and Ehrhardt, 2005; Boynton and Johnson, 2006; etc.). In financial statement analysis, it is conjectured that accounting ratios reveal the financial characteristics of the company. Furthermore, two additional variables are added to the set of accounting ratios. The first variable is an absolute measure of the company’s size, where the company’s assets are used as a size measure (i.e., compare Keasey et al., 1988; Laitinen and Laitinen, 1998). The second variable is a time lag variable, where the days between the date of the annual closing of the company’s financial statements and the date of the signed auditor’s report is measured (i.e., compare Laitinen and Laitinen, 1998). All variables from the list are variables for which data can be retrieved from the companies’ annual financial statements and the auditors’ reports (i.e., because the sample data includes non-listed companies, market variables are not used in this study). The aim of the list of explanatory variables is to enable the identification of the auditor’s report qualification.

| Name of variables | Description |
|-------------------|-------------|
| Y                 | Dependent variable: 1 if auditor's report is qualified, 0 otherwise |
| X<sub>1</sub>     | Debt ratio |
| X<sub>2</sub>     | Debt to equity ratio |
| X<sub>3</sub>     | Long-term financing to long-term assets ratio |
| X<sub>4</sub>     | Quick ratio |
| X<sub>5</sub>     | Liquidity ratio |
| X<sub>6</sub>     | Current ratio |
| X<sub>7</sub>     | Short-term business receivables to short-term business liabilities ratio |
| X<sub>8</sub>     | Inventory turnover ratio |
| X<sub>9</sub>     | Trade receivables turnover ratio |
| X<sub>10</sub>    | Cash turnover |
| X<sub>11</sub>    | Operating efficiency ratio |
| X<sub>12</sub>    | Total assets turnover |
| X<sub>13</sub>    | Working capital turnover |
| X<sub>14</sub>    | Current liabilities turnover |
| X<sub>15</sub>    | Capital employed turnover |
| X<sub>16</sub>    | Short-term assets rate |
| X<sub>17</sub>    | Cash assets rate |
| X<sub>18</sub>    | Return on assets rate |
| X<sub>19</sub>    | Total assets |
| X<sub>20</sub>    | Auditor's report time lag (in days) |

We follow the approach of many applications in various studies from the previous research and use a logit model (see, e.g., Bell and Tabor, 1991; Laitinen and Laitinen, 1998; Gaganis et al., 2007; Pasiouras et al., 2007; among others). There are several reasons for this choice. First, constructing a model to identify an auditor’s report is a variables was reduced to twenty variables using Spearman’s rank correlation coefficient. One variable from the pair of variables, which were correlated (i.e., having a value equal or more than 0.5), was omitted from the list.
binary classification problem. Second, the interpretation of logit models’ results is relatively easy. Because the transformation is based on the sigmoid logistic regression, the outcome of the model can be interpreted as the probability that the company’s auditor’s report will be qualified. Third, the logit model has been widely used in various studies (compare, e.g., Maddala, 1991; Ireland, 2003; Charitou et al., 2004; etc.). Fourth, the logit model has proved to be relatively robust in comparison with various other techniques (compare, e.g., Hansen et al., 1992; Gaganis et al., 2007; Pasiouras et al., 2007). Lastly, the logit model is widely available for use in various software packages. To all these reasons two more can be added. In comparison with other statistical approaches/techniques logit model has characteristic of simplicity in its usage. Furthermore, validation is possible when logit model is used. The maximum likelihood method is used to estimate the parameters of the models.

Over 1 million models (1.048.575) were modelled during the iterative process of combining explanatory variables from the list of 20 variables. During this process, every model’s results were recorded. Akaike’s information criterion (AIC) is used as a selection measure between all competing models. AIC imposes a penalty for adding variables to the model (Gujarati, 2003). The model with the lowest AIC value is preferred. In Table 2, the results are shown for the three models with the lowest AIC value.

| Model abbreviation † | Number of variables | Akaike’s information criterion | Nagelkere’s determination coefficient $R^2_\text{N}$ | Overall accuracy |
|----------------------|---------------------|-------------------------------|---------------------------------|------------------|
| Intercept            | -                   | 102.1881                      | -                               | 0.5000           |
| Model_1              | 8                   | 72.4242                       | 0.4993                          | 0.9625           |
| Model_2              | 7                   | 72.6653                       | 0.4766                          | 0.9590           |
| Model_3              | 6                   | 72.7746                       | 0.4551                          | 0.9590           |

Note: † Variables included in the model and parameter values are presented in Table 4.

As seen in Table 2, the highest value of Nagelkere's determination coefficient ($R^2_\text{N}$) among all presented models is for Model_1, with an observed value of 0.499, which means that 49.9 per cent of the dependent variable’s variability is explained by the eight variables included in the model. A higher value for the determination coefficient is expected in a model with more variables and vice versa. Given the nature of this research, the value of the determination coefficient is unusually higher than expected in research in the field (Tabachnick and Fidell, 2001; Gujarati, 2003).

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7 The overall highest value of Nagelkere’s determination coefficient ($R^2_\text{N}$) among all developed models is 0.518, which means that 51.8 per cent of the dependant variable’s variability is explained by fifteen variables included in the model.
5 The identification of qualified auditors’ reports

The univariate results in Table 3 present the quartiles of twenty explanatory variables for the group of companies with unqualified auditors’ reports and the group of companies with qualified auditors’ reports. Quartiles are used instead of means and variances because of the non-normality observed in the sample data. Kruskal-Wallis statistics are used to show statistically significant differences between the group of companies with unqualified auditors’ reports and the group of companies with qualified auditors’ reports. There are statistically significant differences between the group of companies with unqualified auditor’s reports and the group of companies with qualified auditors’ reports in $X_1$, $X_2$, $X_3$, $X_6$, $X_9$, $X_{13}$, $X_{14}$ and $X_{18}$ (at the risk level 0.01) and $X_5$ and $X_{11}$ (at the risk level 0.05). Thus, the companies with qualified auditors’ reports have lower debt financing rates, higher indebtedness and a worse financial structure than companies with unqualified auditors’ reports. Companies with unqualified auditors’ reports have worse liquidity and efficiency, including negative working capital turnover, a worse trade to receivables ratio and a worse current liabilities turnover, than companies with an unqualified auditor’s report. Furthermore, companies with qualified auditors’ reports have worse profitability than companies with an unqualified auditor’s report. In general, the qualification of an auditor’s report is virtually linked to high indebtedness, low liquidity, low efficiency and poor profitability.

### Table 3: Quartiles of explanatory variables *

| Companies with unqualified auditors’ reports (281) | Companies with qualified auditors’ reports (12) | Kruskal-Wallis test |
|---------------------------------------------------|--------------------------------------------------|--------------------|
| First quartile | Median | Third quartile | First quartile | Median | Third quartile | $\chi^2$ | Stat. sig. |
|---|---|---|---|---|---|---|---|
| $X_1$ | 0.9338 | 0.5402 | 0.7199 | 0.6500 | 0.7467 | 0.8414 | 7.9712 | 0.0046 * |
| $X_2$ | 0.7618 | 1.4579 | 3.0061 | 2.6490 | 4.8761 | 8.1834 | 9.5880 | 0.0020 * |
| $X_3$ | 0.8439 | 1.0176 | 1.3767 | 0.4242 | 0.6679 | 0.8920 | 14.1056 | 0.0002 * |
| $X_4$ | 0.0427 | 0.1591 | 0.3968 | 0.0218 | 0.0984 | 0.2061 | 2.5669 | 0.1091 |
| $X_5$ | 0.5433 | 0.8049 | 1.1761 | 0.4662 | 0.6378 | 0.7123 | 5.2727 | 0.0217 ** |
| $X_6$ | 0.8621 | 1.1495 | 1.5606 | 0.5883 | 0.7121 | 0.9144 | 12.2746 | 0.0005 * |
| $X_7$ | 0.6425 | 1.0037 | 1.3643 | 0.7355 | 0.9854 | 1.9023 | 4.0069 | 0.5266 |
| $X_8$ | 4.5303 | 6.8660 | 21.7250 | 6.1400 | 11.2150 | 25.2200 | 8.6278 | 0.3629 |
| $X_9$ | 3.2701 | 4.7760 | 9.3233 | 2.3866 | 2.8132 | 4.7814 | 7.3833 | 0.0066 * |
| $X_{10}$ | 7.3932 | 17.2359 | 53.7435 | 6.4848 | 19.6536 | 32.4450 | 0.0001 | 0.9917 |
| $X_{11}$ | 1.0222 | 1.0267 | 1.0563 | 0.9035 | 0.9861 | 1.0361 | 5.1862 | 0.0228 ** |
| $X_{12}$ | 0.6827 | 0.9645 | 1.5273 | 0.6392 | 0.8088 | 1.4705 | 0.7385 | 0.3901 |
| $X_{13}$ | -6.3943 | 4.1002 | 14.0000 | -14.148 | -4.7771 | -3.1472 | 7.9418 | 0.0046 * |
| $X_{14}$ | 1.5765 | 2.9085 | 4.4547 | 1.1915 | 1.6650 | 2.3081 | 9.7177 | 0.0016 * |
| $X_{15}$ | 1.3216 | 2.0774 | 5.7394 | 2.2947 | 4.5984 | 6.7941 | 1.8120 | 0.1752 |
| $X_{16}$ | 0.2884 | 0.4437 | 0.6808 | 0.3189 | 0.4423 | 0.6107 | 0.0804 | 0.7768 |
| $X_{17}$ | 0.0171 | 0.0602 | 0.1273 | 0.0090 | 0.0551 | 0.1495 | 0.1587 | 0.8904 |
| $X_{18}$ | -0.0085 | 0.0158 | 0.0562 | -0.1185 | -0.0253 | 0.0023 | 9.6961 | 0.0016 * |
| $X_{19}$ | 31.827.066 | 54.227.193 | 122.532.674 | 39.293.828 | 43.219.975 | 55.733.803 | 0.7585 | 0.3944 |
| $X_{20}$ | 85 | 110 | 153 | 94 | 140 | 169 | 1.3109 | 0.2522 |

Notes: * A description of the explanatory variables is provided in Table 1.

* Significant at 0.01. ** Significant at 0.05.

A logit model was used to develop the auditor’s report identification model. The results for the parameters of three models with the lowest AIC value are provided in Table 4. The estimated parameters cannot be
meaningfully interpreted, therefore, the odds ratio are calculated. The odds ratio represents the odds of variable $X_i$ to the odds of another variable $X_j, j = 1, \ldots, n, j \neq i$, where both variables are in the model. The odds ratio can be interpreted in the following way. In the case of Model_1 the long-term financing to long-term assets ratio ($X_3$) has a value of 0.06, which means that a company that increases the value of its long-term financing to long-term assets ratio for one unit, ceteris paribus, would have 0.06 times the odds (that is, 0.94 times lower odds) of receiving a qualified auditor’s report rather than an unqualified auditor’s report. The statistically significant variables are marked in Table 4.

Table 4: Logistic regression results

| Model 1 | Model 2 | Model 3 |
|---------|---------|---------|
| Param. est. | Odds ratio | Param. est. | Odds ratio | Param. est. | Odds ratio |
| $X_1$ | -2.7343 * | 0.0649 | -2.6895 ** | 0.0679 | -3.5049 ** | 0.0321 |
| $X_6$ | -6.0364 ** | 0.0024 | -6.2688 ** | 0.0019 | -7.3787 ** | 0.0238 |
| $X_7$ | 1.5418 ** | 4.6728 | 1.3696 ** | 3.9337 | 1.1998 *** | 3.3195 |
| $X_8$ | -0.5992 ** | 0.5492 | -0.6058 * | 0.5456 | -0.6374 * | 0.5287 |
| $X_{11}$ | -7.6464 | 0.0005 | - | - | - | - |
| $X_{16}$ | 4.5962 *** | 99.1049 | 4.2099 | 56.2538 | - | - |
| $X_{19}$ | 0.0000 *** | 1.0000 | 0.0000 *** | 1.0000 | 0.0000 ** | 1.0000 |
| $X_{21}$ | -0.0114 ** | 0.9895 | -0.0142 ** | 0.9859 | -0.0124 | 0.9877 |
| $\mu_0$ | 13.0413 * | 840.1243 | 6.8497 | 943.5256 | 7.2700 | 1.436.5666 |

Notes: * Variables $X_1, X_2, X_4, X_5, X_6, X_{10}, X_{12}, X_{13}, X_{14}, X_{15}, X_{17}$, and $X_{18}$ are not shown (that is, these variables are not included in the selected models). A description of explanatory variables is provided in Table 1.

Table 5 shows the performance results. The results show that the overall performance of the developed model is adequate. Identification of unqualified auditors’ reports is successful. However, identification of qualified auditors’ reports is possible, but not all qualified auditors’ reports can be identified with the developed model because values for the false positive rate are lower than expected. All of the performance results were validated using the bootstrap method (n=10.000). The results of this internal validation method are not significantly different in regard to results based on the development sample (see the results in brackets in Table 5). As anticipated, the value of Nagelkere’s determination coefficient is lower but not substantially lower.

Table 5: Logistic regression performance results

| Model 1 | Model 2 | Model 3 |
|---------|---------|---------|
| Nagelkere’s det. coeff. $R^2$ * | 0.4993 (0.4253) | 0.4766 (0.4044) | 0.4591 (0.3846) |
| Overall accuracy | 0.9625 | 0.9590 | 0.9590 |
| True positive rate † | 0.3333 | 0.2500 | 0.1667 |
| False positive rate ‡ | 0.0107 | 0.0107 | 0.0071 |
| c-index * | 0.9469 (0.9388) | 0.9440 (0.9334) | 0.9392 (0.9326) |

Notes: * The true positive rate presents the correct classification of companies with qualified auditors’ reports among the companies with qualified auditors’ reports.
The false positive rate presents the incorrect classification of companies with a qualified auditor’s report among the companies with an unqualified auditor’s report. The results in brackets are the results of internal validation using the bootstrap method (n=10,000).

6 Conclusion

The aim of the present study was to analyse the qualified auditor’s reports of Slovenian companies and to show the circumstances in the company’s economic situation that led to the qualification. A statistical logistic model was developed that considers various company ratios (note: the majority of these are accounting ratios) to explain the qualification of the auditors’ reports. The univariate analysis results show that companies with qualified auditors’ reports have high indebtedness, low liquidity, low efficiency and poor profitability in comparison to companies with unqualified auditors’ reports. This situation can be conjectured to be because the majority of the qualifications in the auditors’ reports are linked to inappropriate valuation or recognition of assets, revenues and expenses. From a statistical viewpoint, a logistic model can distinguish between companies that received a qualified auditor’s report and those that received an unqualified auditor’s report. Analysis of the selected variables does not provide clear evidence of a stronger association between any individually used company’s ratio and the identified auditor’s report in the sample of companies studied. This can be explained as the lack of correlation between individual company’s accounting ratio and the identified auditor’s report. However, a combination of the various companies’ ratios indicates that there is a difference between the companies’ ratios for the companies that receive a qualified auditor’s report and those that receive an unqualified auditor’s report.

These study results reveal that efficient statistical model to explain qualification of auditors’ reports can be constructed for Slovenian (large) companies. The same was previously noted by Laitinen and Laitinen (1998). The developed logistic model presented in this study can in practice be used by auditors, regulator, auditing supervision agency/organization, agencies that publish company’s financial data, academia and anyone else in the ways discussed in the introduction chapter.

Nevertheless, it must be added that (overall) auditing is more a subjective than an objective process. Therefore, an auditor’s report is, to some degree, the result of a subjective process where different auditors adopt different risks (e.g., auditors have different preferences regarding misclassifications and/or misclassification costs). An auditing approach using statistical models when conducting an audit can serve as a basis for making necessary decisions on various measures (parameters) during the audit.
The present research represents the first research that studies auditor’s report qualification on a sample of large Slovenian companies. The present data did not include any bankrupt companies. A possible course for further research could be a study of auditors’ reports regarding Slovenian bankrupt and non-bankrupt companies. Used sample of large Slovenian companies is not a small sample but because of nature of phenomena in study’s research interest there exists a small frequency problem. Used sample of examined auditor’s reports and company’s financial data are limited to only one year (2009). Regarding these sample characteristics there is an increased risk that the study results are inconclusive (note: it is possible results are biased). Additionally, further research could study auditors’ reports of Slovenian companies in comparison with companies from other countries in the southeastern region of Europe. Furthermore, the use of novel methodological approaches in the development of an auditor’s report qualification model remains an unexplored course of research. Additional unexplored venue is possible usage of various other non-financial variables and audit firm/engagement/partner related variables (i.e., audit engagement hours, audit costs, audit fee, etc.). Lastly, because of the possible existence of subjective decision-making by auditors, a possible course of study could be to further research possible qualitative determinants of an auditor’s subjective decision-making process.

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