

# THE ROLE OF THE ISA 570 “ADVERSE KEY FINANCIAL RATIOS” IN GOING CONCERN ASSESSMENT IN ITALY

Melchior Gromis di Trana<sup>\*</sup>, Simona Alfiero<sup>\*\*</sup>

<sup>\*</sup> Corresponding author, Department of Management, University of Turin, Italy  
Contact details: Department of Management, University of Turin, 10100 Turin, Italy  
<sup>\*\*</sup> Department of Management, University of Turin, Italy



## Abstract

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This study aims to identify if financial ratios may be useful tools to assess whether an entity may incur in going concern matters and, as a consequence, in a Going Concern Opinion. Starting from an IAASB suggestion reported in the ISA 570 and our previous investigation establishing which financial ratios are most widely used in professional practice by auditors for this type of evaluation, our research is focused on verifying their effectiveness. In particular, an empirical analysis, based on a logit model and than a discriminant analysis, performed on a sample of Italian listed companies confirms the importance of the relations between the net financial position and the cash flow from operations, as well as the relevance of the equity on debts ratio. The results would help auditors and directors to focus on the synthetic indicators that are the most relevant in the financial sustainability evaluation, but they may also be considered by the Italian Legislator that is implementing the new Italian Insolvency Law Reform to fix the synthetic indicators which are able to warn stakeholders regarding the risk of insolvency.

**Keywords:** Going Concern, Audit Opinion, ISA 570, Financial Ratios, Financial Crisis

**Authors' individual contribution:** Conceptualization - Gromis & Alfiero; Methodology - Gromis; Writing - Alfiero & Gromis; Investigation - Alfiero; Supervision - Gromis.

## 1. INTRODUCTION

The Going Concern (GC) assumption is a highly topical issue, as it is particularly relevant in periods of economic crisis for the proliferation of corporate failures. IAS 1 defines GC as the capability of a company to continue to operate in the foreseeable future. This means that management is periodically obliged to make this type of evaluation in order to prepare financial statements on a GC basis. At the same time, the auditor is obliged to verify it in order to issue an opinion.

From 2008 onwards, this issue has acquired more relevance due to the significant increase in the number of publicly traded Italian companies that have received a modified opinion (GCO) from their auditors because of multiple material doubts regarding their ability to continue as a going concern (15 qualified GCOs were issued in the period between 2004-2007, against 43 in 2008-2011) (Bava et al. 2018). The highly publicized recent GC

uncertainties affecting several Italian companies and credit institutions (including Monte dei Paschi, Italy's third largest bank) have added fuel to the debate surrounding auditors' effectiveness in identifying the risk of corporate failure by applying auditing principles. Furthermore, in Italy, during the Sovereign Debt Crisis, “the financial system suffered for a strong speculative attack that caused a dramatic widening of the spread on Government Bonds” (Pampurini & Quaranta, 2018).

The introduction of Clarified ISAs as the benchmark for all auditing practitioners by the European Union in an EU Regulation has been put on hold. It has been necessary to provide Italian standards. In force since 2015, there is an almost perfect alignment between Italian standards and the future international standards including the Italia ISA 570 concerning the GC discipline.

Regarding the auditing activity involving 2017 financial statements, in July 2017 the Italian standard setter adopted the ISA 570 (Revised) and at

the same time the law (Legislative Decree, 39/2010) was modified in order to make it compliant with the new request of the auditing standard to include a GC disclosure in auditor opinion.

In literature there is extensive debate on the elements that may affect GC assessment. It concerns several variables, such as financial indicators (e.g. inability to pay creditors on due dates or to comply with the terms of the loan agreements) as well as non-financial indicators (e.g. loss of a major market, key customers and managers). ISA 570 identifies only a list of events or conditions (e.g. “adverse key financial ratios”) that may be signals, individually or collectively, of uncertainties about the entity’s ability to continue as a GC, but it does not provide a ranking of their importance in the GC assessment, neither does it specify the type of ratio to use regarding financial ratios. This potential lack has been partially implemented in literature (Bava & Gromis di Trana, 2018).

The purpose of our investigation, based on the Italian evidence, is to identify which financial ratios are the most relevant when assessing the entity’s ability to continue as a GC for the foreseeable future, helping auditors in the preparation of their audit reports, as well as directors in the preparation of financial reporting.

The relevance of this type of research as an Italian case is justified because in Italy, like in many other European countries which are characterized by small companies, the auditors are not generally involved in specialized auditing firms, but they are individual professionals specialized in taxation with limited auditing skills. At the same time, in small companies the average quality of the management is low, and directors are often family members of family businesses without advanced skills in the preparation of financial statements.

This investigation is possible thanks to our previous study (Bava & Gromis di Trana, 2018) that involved Italian partners in auditing firms (Big4 and non-Big4) and Italian academics in the fields of accounting and auditing (SECS-P/07) and finance (SECS-P/09). That analysis was based on an on-line survey that was issued to Italian auditors and academics and it collected their opinions on the most useful financial ratios used in this type of assessment. Starting from there, our target was to produce an empirical test in order to identify a statistical association between the most commonly used financial ratios and a GC problem in the audit opinion.

The paper thus contributes to enriching previous literature first of all by providing an empirical confirmation on the importance of financial ratios in GC assessment, and secondly helping to prioritize GC syntactical signals. The results, which highlight which financial ratios are more effective when assessing an entity’s ability to continue as a GC, can be useful both to directors and auditors, especially for small and medium enterprise. This is a really important topic in Italy today because the Italian Legislator is currently reshaping the nation Insolvency Law and it is working to select ratios that are useful to identify when a company is entering a crisis period (pre-insolvency situation). Directors and auditors must take these ratios into account, because in that case the new rules (law no. 155 dated 19 October 2017)

require greater attention towards the financial trends, an intensification in the company disclosure as well as the preparation of strategic plans to overcome the company’s difficulties. We think that these ratios are a good starting point in this selection because the capacity to satisfy the obligations is at the basis of the GC assumption. This confirms the perfect connection between GC and solvency. To achieve our purpose our research question is: which is the most sensitive financial ratio in order to assess a GCO when a company is financially distressed?

The remainder of the paper is organized as follows. The literature is examined in the next section, then in the third section our hypotheses are developed and the research method is discussed. After presenting the empirical results and a discussion, the paper ends with a brief conclusion.

## 2. LITERATURE REVIEW

In literature there is currently extensive debate on the GC assumption and a large number of studies have investigated the factors that can influence GC assessment. Major summaries of the entire international literature on the subject have been produced by Carson et al. (2013) and by Gissel et al. (2010).

Many of them are focused on analyzing financial statement items (financial indicators and financial ratios), while others also aim to investigate non-financial indicators (e.g. market variables, strategic initiatives and governance characteristics), or the role of management plans or client characteristics (e.g. business sector, ownership structure, etc.) and auditors’ characteristics (e.g. independence, non-audit services, fees, partner’s gender, auditor tenure, etc.).

**Table 1.** GC financial ratios

<i>Liquidity indicators</i>	
Current assets/Current liabilities	Kida 1980; Mutchler 1985; Menon and Schwartz 1987
Interest expense/Earnings before interest and tax	Koh 1991
Cash/Current liabilities	Kida 1980; Koh and Killough 1990; Koh 1991; Lennox 1999
Working capital/Total liabilities	Mutchler 1985
Cash flow from operations/Total liabilities	Menon and Schwartz 1987; Raghunandan and Rama 1995
<i>Leverage indicators</i>	
Market value of equity/Book value of debt	Altman and McGough 1974
Book value of net worth/Book value of debt	Kida 1980
Total long term liabilities/Total assets	Mutchler 1985
Total liabilities/Total assets	Dopuch et al. 1987; Raghunandan and Rama 1995
<i>Profitability indicators</i>	
Net income/Total assets	Kida 1980; Mutchler 1985; Dopuch et al. 1987
Retained earnings/Total assets	Altman and McGough 1974; Koh and Killough 1990; Dopuch et al. 1987; Menon and Schwartz 1987
Earnings before interest and taxes/Total assets	Altman and McGough 1974
Net income before tax/Net sales	Mutchler 1985
Current and/or recurring losses	Dopuch et al. 1987; Lee et al. 2005

In line with these studies, ISA Italia 570 has identified a series of events or conditions that, individually or collectively, may cast significant doubt on the entity's ability to continue as a GC.

Some researchers try to develop quantitative models for predicting failure which can provide auditors with useful tools in order to reduce the inherent subjectivity of making GC assessments, and help build consent around the auditor's decision (Carson et al., 2013).

In accordance with literature (Carson et al., 2013), studies dealing with financial indicators are illustrated in Table 1.

Some studies have sought to determine which indicators company auditors regard as being the most important ones in their professional practice. Mutchler (1984), LaSalle and Anandarajan (1996) issued a questionnaire to obtain survey evidence from auditors about the importance they assign to different financial ratios in their GC reporting decisions.

According to these researchers, the five main ratios found are shown in Table 2.

These studies did not produce empirical tests on those ratios in order to evaluate their sensitivity, but it is observable that those indicators are nearly the same.

As emphasized by Carson et al. (2013), since the audit environment is continually changing, it is necessary to update evidence on the financial statement variables that auditors rely on when making GCO decisions. For this reason, Bava &

Gromis di Trana (2018), through a national interview, collected the opinion of 91 partners of audit firms (Big4 & non-Big4) and 190 academics who are experts on this specific topic.

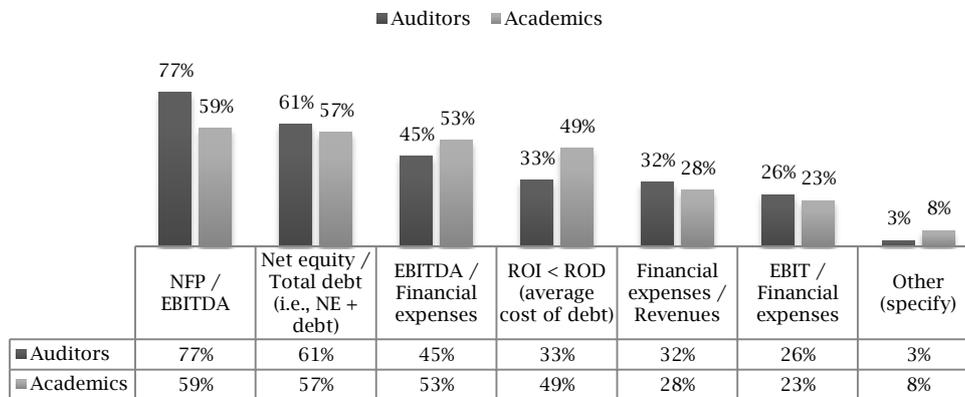
**Table 2.** GC financial ratios collected by questionnaires

<i>Mutchler (1984)</i>	<i>LaSalle &amp; Anandarajan (1996)</i>
Cash flow from operations/total debt	Cash flows from operations/total liabilities
Net worth/total debt	Net worth/total liabilities
Current assets/current liabilities	Current assets/current liabilities
Total debt/total assets	Total liabilities/total assets
Total liabilities/total assets	Change in net worth/total liabilities

Our research was aimed at prioritizing the contents introduced by the ISA 570 that was coming into force in Italy for the first time. The questionnaire was, in primis, oriented towards verifying the relevance attributed to the different types of indicators (financial, operating and others). Both the auditors (86%) as well as the academics (69%) stated that the financial indicators were the most important. Subsequently, focusing on the financial indicators, we investigated the financial ratios which were applied the most.

Respondents could select up to 3 choices. Figure 1 shows the ratios ranking.

**Figure 1.** GC financial ratios ranking



It is observable how the auditors ranking is perfectly aligned with that of the academics

The two indicators (Table 4 and Figure 1) designated by both as being the most important (NE/Debt and NFP/EBITDA) are among those most frequently used in Italy by banks to evaluate debt sustainability from equity and financial standpoints respectively. Though synthetic, they are particularly effective in signaling whether an entity has problems in these areas.

The fact that EBITDA/Financial expenses were assigned a higher score than EBIT/Financial expenses and Financial expenses/Revenues is understandable, as EBITDA is more reliable than EBIT as a measure of a firm's ability to generate cash, and the information value of the weight of financial expenses on revenue is limited by the fact

that revenues do not represent a margin. Consequently, using this indicator presupposes that the firm's revenues enable it to maintain a certain level of financial expenses, which is not true for all firms with a very low operating income. The two indicators designated as being the most important are basically in line with previous literature Mutchler (1984) and LaSalle and Anandarajan (1996).

Starting from this evidence, we tested the sensitivity of these financial ratios in order to verify the presence of a direct association between specific ratios and going concern matters. We decided to limit our investigation to the Bava & Gromis di Trana (2018) results that are more current, in order to focus our attention on the Italian environment but also because Auditing, as many other subjects, evolves over time. This is the first

research that extends this type of analysis to the Italian context. In fact there are no other investigations aimed at collecting the opinions of Italian experts on this topic, as well as the previous investigations based on questionnaires (addressed to other countries) are not supported by empirical testes.

Furthermore, this research may be a starting point for other publications because the Italian legislator is reshaping the national Insolvency Law by introducing financial ratios in order to predict a company crisis. These indicators oblige companies to pay more attention in order to limit the Insolvency risk.

### 3. RESEARCH METHOD

As has been illustrated in the review of the literature, this study is oriented towards identifying an empirical confirmation of the Bava & Gromis di Trana (2018) evidence. In particular, the analysis completes the previous one aiming to test the financial ratios suggested by Italian auditors and academics.

From the professional standpoint, we believe that our findings can provide directors and auditors with a useful basis for prioritizing certain indicators over others. While we cannot claim to be able to establish a generally applicable hierarchy (a goal which we feel to be unreachable given the complexity of GC issues), we have identified indicators that are regarded as being particularly effective in signaling GC risks.

Our research question is the following: *Focusing on the financial indicators generally used in this type of evaluation by external users (auditors, analysts and banks), which of them are the most sensitive in order to assess a GCO when a company is financially distressed?*

ISA 570 suggests some general indicators, but professional practice and literature have shed light on identifying more specific financial ratios. Our RQ aims to verify the financial ratios that are considered by auditors and academics to be the most relevant in order to evaluate GC when a company is distressed. To complete this analysis, we tested those indicators on a sample of financially distressed Italian listed companies that have incurred a GC problem. In accordance with literature, we focused on distressed companies because auditors virtually never issue a GC opinion to healthy companies (McKeown et al., 1991; Bava et al., 2018). For this reason, our sample includes only companies that in the observation period incurred or were close to incurring in GC matters. Thus the sample consists of the companies that were on the Black or Gray list of CONSOB (which is the Italian equivalent of the Securities and Exchange Commission) at least once<sup>1</sup>.

In order to produce a comparison between the two groups (GCO=0 and GCO=1), for each company which appeared on these lists at least once during

the 5-year period under observation, (2008-2012), we inserted in our sample that company for each year of observation (5 company-years from 2008 to 2012) whenever possible. For instance, a company that had GC problems in 2012 and had therefore been put on the grey list that year, may have had clean opinions in the previous 4 years. Applying this method we observed 53 Italian listed companies from 2008 to 2012 (5 years). The 265 company-years were reduced due to the delisting process as well as to their failure. For a few of them (generally failed after 2012) we did not find any official data and therefore they had to be excluded. The final sample observed consists of 217 company-years. The sample may be divided into two main groups: companies that have received a GCO (GCO=1) and companies that have received a clean opinion regarding GC. Table 3 describes the sample composition:

Table 3. Sample composition

Year	GCO = 1	GCO = 0	No. of companies	(GCO = 1)/Tot.
2008	23	25	48	.48
2009	25	21	46	.54
2010	26	16	42	.62
2011	29	12	41	.71
2012	30	10	40	.75
	133	84	217	

The financial ratios suggested were tested by estimating a logistic regression model where the type of audit opinion is the dependent dichotomous variable.

This model is specified below:

$$GCO_{i,t} = \alpha_0 + \beta x(\text{test variables})_{i,t} + \beta x(\text{control variables})_{i,t} + \varepsilon_{i,t} \quad (1)$$

where for firm  $i$  at year  $t$ . *Test* and *control variables* are better defined in the following paragraphs.

#### Dependent variable

GCO<sub>*i,t*</sub>: 1 if the audit opinion includes a GC qualification, 0 if it does not.

It is formed by examining the opinions and explanatory paragraphs of all audit reports. When an opinion included multiple qualifications and at least one addressed a GC problem, we classified it as GCO. Moreover, it is 1 also if the problem is so relevant that it leads to a disclaimer opinion or to an adverse one. The cases are so limited (18 companies-year) that they do not draw any statistical inferences.

#### Test variables

Test variables (Table 4) are suggested by auditors and academics in the specific question [3] on the main ratios that must be considered.

<sup>1</sup> These lists included listed companies that are subject to more frequent obligations of information disclosure, pursuant to Italian art. 114 of Legislative Decree, 24 February 1998, n. 58. The inclusion on the black list is decided by Consob on the basis of two elements: the fact that a company has incurred losses of more than 1/3 of its equity or that a company has incurred an audit opinion that includes a GC qualification. The latter case has been defined as a "gray list" and refers to those companies for which the auditors issued a GC emphasis of matter paragraphs.

Table 4. Test variables

Variable	Description	Prevision
NFP/EBITDA <sub>i,t</sub>	This ratio is the number of years it will take for the company to pay back its debts through its operating activity. In fact, EBITDA (Earnings Before Interest, Taxes, Depreciation and Amortization) is a synthetic indicator of the long-term operating cash flow and Net Financial Position (NFP) is debts (financial liabilities) minus cash and cash equivalents. In order to reduce the scattering of this variable a ceiling has been fixed at a value equal to 1,000. The same value has been applied when EBITDA is a negative.	+
EQ/DEBT <sub>i,t</sub>	This ratio compares the equity (EQ) amount with the total amount of the outside financial capital plus EQ (DEBT).	-
FEXP/REV <sub>i,t</sub>	It assesses the weight of the financial expenses (FEXP) on the operating revenues (REV).	+
EBITDA/FEXP <sub>i,t</sub>	It assesses the weight of the EBITDA on the financial expenses (FEXP). This value is 0, when EBITDA is negative.	-
ROI>ROD <sub>i,t</sub>	It is a dummy variable equal to 1 if the ROI (return on investment) is superior to ROD (average cost of debt), 0 if it is not. ROI is EBIT (Earnings Before Interest and Taxes) on the Tot. Assets amount. ROD is assessed as the relation between Financial Expenses (FEXP) and debts (DEBT).	-

In our model we excluded Z-score for two reasons. First of all because in Bava & Gromis di Trana (2018) the majority of the auditors (86%) and academics (58%) specified that they do not use it, and secondly because that variable (a measure developed by Altman (1968), but also revised by Zmijewsk (1984)) is correlated with our test variables. It is significant that these variables are all based on the current financial statements, because the auditor's opinion is issued on the financial statements drafts. However, in order to limit the effect produced by a redundancy of bad ratios over time, in line with literature we introduced control variables (PLOSS and PGCO) able to reflect the

previous year's financial situation. This will be explained in greater detail in the next paragraph.

#### Control variables

The control variables were identified in previous literature as they are likely to affect the audit opinion decision. We have reduced the impact of the financial ratio (Carcello et al., 1995; Carcello & Neal, 2000; Chen & Church, 1992; Dopuch et al., 1987; Geiger & Rama, 1995; Mutchler, 1985; Mutchler et al., 1997) in this section to avoid correlation between independent variables. Previous signs have been applied, but their effects are neither respected nor statistically significant in theory.

Table 5. Control variables

Variable	Description	Source	Prevision
SIZE <sub>i,t</sub>	Natural logarithm of the Tot. Assets.	Weber & Willenborg (2003); Kaplan & Williams (2012); Herbohn et al. (2007); Bava et al. 2018	+
PLOSS <sub>i,t-1</sub>	Dummy variable equal to 1 if the company experienced a positive net income in the previous year, 0 if it did not. This variable, in line literature, is oriented to limit the effect produced by the company's condition in the previous years.	Tsipouridou & Spathis (2014)	-
PGCO <sub>i,t-1</sub>	Dummy variable equal to 1 if the company received a qualified opinion in the previous year, 0 if it did not. This variable, in line with literature, is oriented to limit the effect produced by the company's condition in the previous years.	Mutchler (1985); Carcello and Neal (2000); Bava et al. 2018	+
BIG4 <sub>i,t</sub>	Dummy variable equal to 1 if the auditor is a member of the BIG4, 0 if it is not.	Tsipouridou & Spathis (2014); Bava et al. 2018	+
CURR <sub>i,t</sub>	Current ratio is assessed by comparing current assets and current liabilities. This is a common variable applied in this type of analysis. We are surprised that auditors did not suggest it.	Sun (2007); Tae & Chul-Young (2007); Uang et al. (2006)	-

Applying those variables our final model is as follows:

$$\begin{aligned}
 GCO_{i,t} = & \alpha_0 + \beta_1 NFP/EBITDA_{i,t} + \beta_2 EQ/DEBT_{i,t} \\
 & + \beta_3 FEXP/REV_{i,t} \\
 & + \beta_4 EBITDA/FEXP_{i,t} \\
 & + \beta_5 ROI > ROD_{i,t} + \beta_6 SIZE_{i,t} \\
 & + \beta_7 PLOSS_{i,t-1} + \beta_8 PGCO_{i,t-1} \\
 & + \beta_9 BIG4_{i,t} + \beta_{10} CURR_{i,t} + \varepsilon_{i,t}.
 \end{aligned} \quad (2)$$

The same model has been performed changing the structure of our sample in order to reduce the deviation produced by a redundancy of the same companies over time. The first test (Model 1) involves the total aggregation of the 5-year companies from 2008 to 2012. The second test (Model 2) is based exclusively on 2008, 2010, and 2012. The third one (Model 3) is based only on 2008 and 2012. It is significant that the companies are

almost the same for every year, because as has been explained previously for each company involved in a Consob list we selected if for every year of observation from 2008 to 2012.

To support our analysis we tested our 5-year sample with a discriminant analysis to verify the capability of our model to predict a GCO. This type of analysis does not aim to identify a model able to perform this type of evaluation, but only to find another confirmation on the capability of our variables in order to predict GC problems for bad health companies.

## 4. RESULTS

Our analysis as a first step introduces a descriptive investigation so as to describe better the sample composition in relation to the variables observed. This type of analysis has been made starting from the total population that was split in two in relation

to the dichotomous dependent variable. This type of observation makes it possible to identify the difference between companies with GCOs and the others.

Table 6 shows the descriptive statistics of the total sample.

**Table 6.** Descriptive statistics (Aggregate)

N=217		NFP/EBITDA	EQ/DEBT	FEXP/REV	EBITDA/FEXP	ROIROD	SIZE	PRELOSS	PREOP	BIG4	CURR
Mean		595	29.96	12.65	19.59	.19	4.89	.36	.67	.66	1.21
Median		1,000	30.07	4.74	.00	.00	5.00	.00	1.00	1.00	.98
Mode		1,000	-2.48a	.03a	.00	.00	5.00	.00	.00	1.00	.98
Std. Deviation		485	27.47	18.29	114.21	.39	.75	.48	.73	.47	1.38
Variance		235,656	755	334	13,044	.156	.57	.23	.54	.23	1.9
Minimum		.00	-45.17	.00	-.51	.00	1.00	.00	.00	.00	.02
Maximum		1,000	94.18	87.67	1,000	1.00	7.00	1.00	2.00	1.00	17.18
Percentiles	25	5	9.58	2.29	.00	.00	5.00	.00	.00	.00	.57
	50	1,000	30.07	4.74	.00	.00	5.00	.00	1.00	1.00	.98
	75	1,000	48.33	16.31	1.48	.00	5.00	1.00	1.00	1.00	1.50

Note: a. Multiple modes exist. The smallest value is shown

Here we compare the difference dividing the sample into two categories in relation to the

dependent variable: GCO=0 (Table 7) and GCO=1 (Table 8).

**Table 7.** Descriptive statistics (GCO=0)

N=84		NFP/EBITDA	EQ/DEBT	FEXP/REV	EBITDA/FEXP	ROIROD	SIZE	PRELOSS	PREOP	BIG4	CURR
Mean		505	42.70	12.12	35.55	.22	4.88	.53	.18	.62	1.47
Median		558	40.80	4.54	.00	.00	5.00	1.00	.00	1.00	1.21
Mode		1,000	42.58	.03a	.00	.00	5.00	1.00	.00	1.00	.98
Std. Deviation		497.83	21.57	17.59	156.86	.42	.88	.50	.44	.49	.98
Variance		247,837	465.67	309.57	24,605.93	.18	.78	.25	.19	.24	.96
Minimum		.00	-6.61	.00	.00	.00	1.00	.00	.00	.00	.17
Maximum		1,000	89.52	87.67	1,000	1.00	7.00	1.00	2.00	1.00	6.22
Percentiles	25	4	30.33	2.08	.00	.00	5.00	.00	.00	.00	.88
	50	558	40.80	4.54	.00	.00	5.00	1.00	.00	1.00	1.210
	75	1,000	59.65	12.89	2.10	.00	5.00	1.00	.00	1.00	1.78

Note: a. Multiple modes exist. The smallest value is shown

**Table 8.** Descriptive statistics (GCO = 1)

N=133		NFP/EBITDA	EQ/DEBT	FEXP/REV	EBITDA/FEXP	ROIROD	SIZE	PRELOSS	PREOP	BIG4	CURR
Mean		652.54	21.37	13.01	9.36	.17	4.90	.26	.99	.68	1.04
Median		1,000	18.71	4.88	.00	.00	5.00	.00	1.00	1.00	.87
Mode		1,000	-2.48a	.07a	.00	.00	5.00	.00	1.00	1.00	.03
Std. Deviation		470.28	27.74	18.80	74.10	.38	.66	.44	.72	.46	1.57
Variance		221,168	769.59	353.58	5,492.14	.14	.45	.19	.515	.22	2.47
Minimum		.00	-45.17	.01	-.51	.00	2.00	.00	.00	.00	.02
Maximum		1,000	94.18	85.55	839.53	1.00	7.00	1.00	2.00	1.00	17.18
Percentiles	25	7	5.29	2.67	.00	.00	5.00	.00	.00	.00	.42
	50	1,000	18.71	4.88	.00	.00	5.00	.00	1.00	1.00	.87
	75	1,000	34.89	17.10	1.03	.00	5.00	1.00	1.50	1.00	1.28

Note: a. Multiple modes exist. The smallest value is shown

The subsets of firms differ significantly. A more detailed investigation reveals that the results are in accordance with our association forecast. Taking into account the means of our five test variables there is a clear deterioration of those ratios in the presence of GCOs. This means that companies with a GCO have on average a NFP/EBITDA superior to the others (652 against 505). Companies with a superior value as a relation between Equity and Debts are less oriented towards a GCO (42.7 against 21.4). Different values in FEXP/REV suggest that the relevance of the financing expenses is on average higher for the non-GC companies (13.1 against 12). Moreover, the EBITDA/FEXP ratio suggests a relevant discrepancy between GC companies where Ebitda is on average 35 times the financing expenses value against the only 9 times assessed when GC is absent. 22% is the percentage of companies where the ROI is higher than the ROD, against a 17% recognized for the non-GC companies.

A comparison between the control variables reveals that on average companies with a GCO are

bigger (4.90 against 4.88) and generally they receive a GCO in the previous year. GCO companies are generally revised by a BIG4 (.68) against a lower rate for the others (.62). 74% (1-.26) of GCO companies experienced a loss in the previous year, against 47% for the others. From a financial perspective, current assets are 1.04 times the current liabilities for the GCO companies. The value is superior for non GCO (1.47). Descriptive statistics do not present inferences in the results.

After the descriptive statistic recognition, the analysis is oriented towards identifying correlations between the variables involved. This is a first step in order to verify the presence of a relationship between our test variables, but at the same time it is also a tool to verify correlations between our independent variables.

The correlation analysis is provided in Table 9. Significant correlations, measured by Pearson, exist between several pairs of variables. These correlations suggest that a multi-collinearity test is necessary.

Table 9. Pearson's correlation

	1	2	3	4	5	6	7	8	9	10	11	
1	NFP/EBITDA	1										
2	EQ/DEBT	.047	1									
3	FEXP/REV	.249**	.143	1								
4	EBITDA/FEXP	-.211**	.039	-.128	1							
5	ROI/ROD	-.608**	-.040	-.166*	.229**	1						
6	SIZE	-.010	-.029	.187*	-.153*	-.020	1					
7	PRELOSS	-.343**	.127	-.215**	.217**	.384**	-.024	1				
8	PREOP	.074	-.311**	.065	-.126	-.061	-.076	-.231**	1			
9	BIG4	-.021	-.018	.153*	-.140*	-.047	.315**	-.095	-.003	1		
10	CURR	.057	.381**	-.012	-.015	.010	-.183**	-.003	-.165*	-.212**	1	
11	GCO	.148*	-.383**	.024	-.112	-.064	.019	-.275**	.533**	.067	-.153*	1

Notes: \* Correlation is significant at the 0.05 level (2-tailed); \*\* Correlation is significant at the 0.02 level (2-tailed).

In Table 9 it is possible to observe a correlation between GCO and two test variables (NFP/EBITDA and EQ/DEBT). In the first case, the correlation is low and positive, but regarding EQ/DEBT the relation is stronger and negative. Both are aligned with our forecasts. GCO is also related with other control variables. Indeed, we identify a strong correlation between GCO and PREOP, as well as a moderate correlation with PRELOSS and CURR.

The model also raises other associations between test variables and control variables and this justifies multicollinearity tests.

Our analysis was completed by verifying the presence of associations between our test variables on our dependent variable. To this aim we performed our data using IBM SPSS 23.

We performed a first analysis applying a paired-sample approach. This method aims to verify possible differences in each variable when the same company changes its status (from a GC company into a non-GC company) over time. To perform this type of analysis we had to reduce our sample (30 companies) selecting only those with a change in their type of opinion (GCO 0; 1) during the observation period (2008-2012).

Table 10. Paired sample analysis

		Paired Differences					t	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference			
					Lower	Upper		
Pair 1	NFP/EBITDA (0;1)	-146.16	497.977	89.439	-328.828	36.490	-1.634	0.113
Pair 2	EQ/DEBT (0;1)	0.032	0.529	0.095	-0.161	0.226	0.342	0.734
Pair 3	FEXP/REV (0;1)	-0.96	13.01919	2.603	-6.337	4.410	-0.370	0.715
Pair 4	EBITDA/FEXP (0;1)	-15.40	79.225	14.229	-44.468	13.651	-1.083	0.287
Pair 5	ROI/ROD (0;1)	0.115	0.515	0.101	-0.092	0.323	1.140	0.265

T-tests reveal values with a  $p > .113$ . This type of analysis does not produce results that are statistically significant. There may be different reasons behind these results, for instance, the GC assessment is a really complex evaluation and it might be hard to limit it to only one financial ratio.

In order to solve it, we opted to verify the relevance of these ratios combining them with other variables that are able to influence that type of assessment.

Thus we tested our test variables (financial ratios) estimating three logistic regression models in order to avoid any serial correlation or serial dependence in data. The first model involves the aggregation of the 5-year companies from 2008 to 2012. The second model is based exclusively on 2008, 2010, and 2012. A third and last model is based only on 2008 and 2012. The results are shown in Table 11.

Table 11. Estimation results of logistic regressions

Variables	Expected Sign	Model 1 N=217		Model 2 N=130		Model 3 N=88		VIF
		B	Wald	B	Wald	B	Wald	
Costant		-.137	.007	-.074	.001	-1.763	.399	
NFP/EBITDA	+	.002***	6,462	.002*	3,379	.003***	5,121	1.813
EQ/DEBT	-	-.041***	11,119	-.055***	9,182	-.029	1,629	1.585
FEXP/REV	+	-.011	.592	-.006	.144	-.025	.645	1.187
EBITDA/FEXP	-	.001	.739	.002	.787	.001	.423	1.128
ROI > ROD	-	.788	1,367	.901	.808	1,296	.954	1.784
SIZE		.194	.449	.307	.716	.782	1,918	1.132
PRELOSS		-.624	1,558	-.455	.350	-.884	.809	1.546
PGCO		2,020***	22,163	3,167***	13,394	2,683***	7,811	1.239
BIG4		-.317	.362	-.898	1,439	-1,804	2,662	1.175
CURR		-.418	1,712	-.499	1,378	-1,201*	3,685	1.514
Chi-square		89,411***		65,116***		41,546***		
Pseudo R2		.426		.485		.488		

Note: \* Correlation is significant at the 0.05 level (2-tailed); \*\* Correlation is significant at the 0.02 level (2-tailed); \*\*\* Correlation is significant at the 0.01 level (2-tailed).

The GCO for financially distressed firms are explained by NFP/EBITDA, EQ/DEBT, PGCO, which are statistically significant at less than .02. Companies with a higher value in NFP/EBITDA have a higher probability of receiving a GCO. On the contrary, companies with a lower value in EQ/DEBT have a higher probability of receiving a GCO because the association is inverse. These results are confirmed in Model 1 and Model 2. In Model 3, the relation is inverse but it is not statistically confirmed. In Model 3, CURR is negatively associated with GCO. In the three models, in accordance with previous literature, PGCO is strongly associated and it means that the issuance of a GCO in the previous year increases the auditor's propensity to issue a qualified opinion in the current year. The other variables suggested by auditors and academics are not empirically confirmed. This does not mean that they are not relevant but probably they are less

directly correlated and they may also be influenced by other factors. The VIF scores are within acceptable limits which means that our models are not affected by multi-collinearity. The logit Pseudo-R<sup>2</sup> indicates how well the data fits the presumed underlying theoretical distribution. Pseudo-R<sup>2</sup> is computed as a  $\chi^2$  model divided by the number of observations minus the number of variables plus one plus the  $\chi^2$  model. The overall models are significant with Pseudo R<sup>2</sup>s of .426, .485 and .488. The model is not affected by heteroscedasticity problems.

Then, also testing the predictive capability of our variables we performed a discriminant analysis applied to our 5-year sample. Table 12 presents the test of Equality of Group Means.

**Table 12.** Test of equality of group means

	Wilks' Lambda	F	Sig.
NFP/EBITDA	0.971	4.669	0.03
EQ/DEBT	0.783	44.17	0.00
FEXP/REV	0.997	0.53	0.47
EBITDA/FEXP	0.999	0.149	0.70
ROI>ROD	0.995	0.764	0.38
SIZE	0.998	0.279	0.60
PRELOSS	0.91	15.699	0.00
PREOP	0.721	61.496	0.00
BIG4	0.998	0.354	0.55
CURR	0.915	14.784	0.00

These results confirmed the importance of our test variables, in particular the relevance of a previous GCO (PGCO) as well as a previous loss (PLOSS) and the current ratio (CURR). The significance is also confirmed for 2 out of 5

variables identified by our survey: EQ/DEBT and NFP/EBITDA.

The quality of our model was tested in Table 13.

**Table 13.** Eigenvalues & Wilks' Lambda

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	.750	100	100	0.655
Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1	0.571	86.168	10	0.00

The Wilks' Lambda describes how well the prevision model fits and it is statistically significant with an adequate value. Statistics do not reveal deficiencies in our model and in its variables.

Having verified the model, the standardized coefficients are given in Table 14.

**Table 14.** Standardized canonical discriminant function coefficients

	Standardized Canonical Discriminant Function Coefficients	Rank	Canonical Discriminant Function Coefficients
NFP/EBITDA	0.39	3	0.001
EQ/DEBT	-0.47	2	-0.02
FEXP/REV	-0.15	-	-0.008
EBITDA/FEXP	0.09	-	0.001
ROI>ROD	0.17	-	0.4
SIZE	0.08	-	0.118
PRELOSS	-0.23	-	-0.486
PREOP	0.68	1	1.133
BIG4	-0.01	-	-0.014
CURR	-0.20	-	-0.246
(Constant)			-0.661

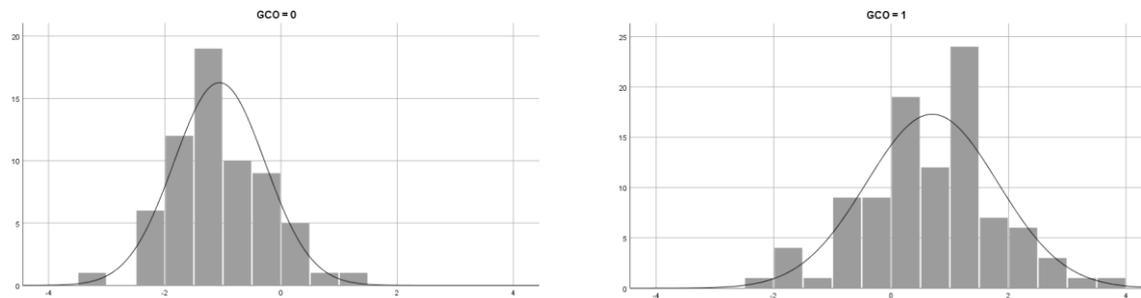
Our evidence points to the presence of a GCO in the previous year (PGCO) as the most important predictive variable. This is probably the result of a similar evaluation performed in previous years, or it may also be the consequence of other types of

indicators (e.g. operating indicators) that have previously produced effects. The relevant variables collected in our survey are EQ/DEBT and NFP/EBITDA. We took into account only the variables with a coefficient superior to .3. The group

centroid value estimated for companies without GCO problems is -1.059, whereas for companies with GC

problems it is equal to .699. The distribution of our sample is shown in Figure 2.

**Figure 2.** Group graphs



Concerning the capability of our model to predict a GCO, 80.2% of the predicted GCOs in our model are confirmed in a real context. At the same time, 87.2% of the clean opinion predictions are confirmed.

Performing the same discriminant analysis applying the stepwise method to the selection of the variables results in a model based on three main variables: PGCO, EQ/DEBT and NFP/EBITDA.

## 5. CONCLUSIONS

The GC topic has recently been widely debated due to the Global Financial Crisis and also for the fact that compulsory Italian auditing standards (inter alia Italia ISA 570) have recently come into force. In literature, many studies aim to identify the main determinants on GC assessment and many of them are focused on financial indicators based on financial statement items.

In our work, we have investigated whether, in the Italian context, financial ratios based on financial statements data are useful tools in order to assess the presence of the GC assumption.

To perform this type of test we took into account ratios suggested by the professional auditor practice and academics' experience in our previous investigation (Bava & Gromis di Trana, 2018). One of the indicators provided by Italia ISA 570 is "adverse key financial ratios", but the document does not specify which ratios should be preferred for GC assessment. Responding to RQ, our work has identified which, among specific financial ratios suggested by auditors and academics, are the most relevant in GC assessment. Through an empirical test we found that the two most important financial ratios suggested (EQ/DEBT and NFP/EBITDA) are directly relevant and associated to evaluate GC risks. This study does not, and could not, claim to identify single indicators that can signal the inability to continue as a going concern, as this is a complex assessment that cannot – as was also noted by the surveyed auditors and academics – be reduced solely to the application on the approved financial statements of financial ratios. Such an assessment must simultaneously consider many other types of factors (financial, operating, and others) as suggested by the standard setter, and, especially, the budget of the company. Anyway, they fix elements which are easy to assess that must be considered in this type of evaluation. Our evidence is aligned with previous literature because on the one hand it

confirms the relevance of ratios based on financial statements (Bava & Gromis di Trana, 2018), and on the other they are aligned with the literature which supports liquidity and leverage indicators (Carson et al., 2016; Menon & Schwartz, 1987; Raghunandan & Rama, 1995; Altman & McGough, 1974).

Our analysis contributes to literature because until now studies in this field have identified ratios using two different approaches: questionnaires or the application of statistical models. In our work we have linked them together. First of all we selected ratios collecting the opinions of auditors (practice) and academics (theory) and then we tested them using statistical models. We think that for this type of research it is very important to find empirical confirmation in practice because suggestions are useless if they are not actually used in a real context. At the same time, every statistical model may present limitations that must be taken into account in a real evaluation. We think that these elements must be combined together in order to be complete.

Our evidence can be useful both for directors, auditors and financial statement users in order to lead them towards a more accurate valuation of GC assumption, mostly in a context characterized by small and medium entities where budgets and forecasts are often based on assumptions that are difficult to verify because they are not based on external and verifiable elements. In a previous survey (Bava & Gromis di Trana, 2018), we asked audit firms what percentage weight they assigned to the forecasts made in management plans when making a GC assessment, and what weight they assigned to the information disclosed in the financial statements. Big4 partners attribute superior relevance to the business plan, 56.05%, against 46.90% for non-Big4 partners. The highest number of non-Big4 respondents believe that approved financial statements are more important than plans. Moreover, the fact that Big4 partners seem to be more oriented towards giving greater weight to management plans might be surprising, because GC assessments must necessarily be prospective. In theory, one would thus expect a greater reliance on forecasts. However, this finding can be explained by considering that forecasts and plans have an inherent level of uncertainty that often undermines their reliability, particularly in small and medium-sized firms where non-Big4 auditors are predominant.

Furthermore, in Italy, with particular regard to small entities, auditors are not partners of

specialized auditing firms but are often professionals with limited auditing skills mainly involved in taxation issues. At the same time, the quality of the management in small family businesses (the most common company in Italy) is low. For this reason, this type of analysis is more useful in order to suggest synthetic indicators that can guide directors in the preparation of financial statements.

Moreover, our work may be useful for the Italian Legislator that in recent months has been reshaping the national Insolvency Law, fixing synthetic ratios that must be considered by both directors and auditors as signals for a possible bad health situation for the company. In that case, a company is obliged to satisfy requirements in order to inform stakeholders, but at the same time to apply strategies oriented to overcome the difficulties.

Our paper deals with synthetic tools able to verify the sustainability of a company, because, from a financial perspective, a company is sustainable when it is able to guarantee the presence of the GC assumption. The relevance of our study increases if we think that this is almost the only test that external financial statements users can perform in order to verify the capability of a company to survive in the foreseeable future.

Future researchers have to take these ratios into account as control variables in future models

oriented towards explaining or predicting GC uncertainties.

First of all, the aim of our work is not to find a model able to identify the presence (or the absence) of the GC assumption. This type of evaluation is so complex that it cannot solely be limited to a synthetic ratio. Keeping this starting assumption in mind, our work is affected by some limitations. Ratios are only assessed on the current year. This is due to the fact that the CG must be assessed on the current financial statements. In our work we do not take into account the effect produced by a redundancy of a stress situation over time. In line with the main research studies on this field, we opted to introduce dummy variables as the presence of a previous GCO and a previous LOSS in order to limit that type of influence. In addition, in Accounting, as well as for GC research, models may be affected by endogeneity. This is a common problem in the fields of Accounting and Finance, and to solve this problem it is possible to perform two-stages last square or instrumental variables (Gippel et al., 2015). In our work we did not perform them because we repeat models which are widely used in literature, but future research may use them to verify the relevance of this problem in these empirical assessments. It should be noted that all regulation or policy changes are sources of exogenous variation.

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