

Potential Threats to Audit Firm Independence: Evidence from Italy on Audit Quality

Marco Angelo Marinoni¹, Anna Maria Fellegara² & Andrea Lippi³

¹ Assistant professor, Catholic University of Sacred Heart, Piacenza, Italy

² Dean, Faculty of Economics and Laws, Catholic University of Sacred Heart, Piacenza, Italy

³ Associate professor, Catholic University of Sacred Heart, Piacenza, Italy

Correspondence: Marco Angelo Marinoni, Catholic University of Sacred Heart, Piacenza, Italy.

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Abstract

Purpose – This study aims to investigate the potential threats to the independence of an auditor who provides both auditing and non-audit services (NAS), in terms of credibility of and confidence in audit quality.

Design/methodology/approach – In this study, we first replicate the results of Campa and Donnelly (2016) using hand-collected publicly available data for a sample of 91 Italian manufacturing public companies audited by a Big 4 and non-Big 4 audit firm over a longer time horizon (2015-2019) using the panel data approach, based on three interconnected regression models.

Findings – Previous studies in this area did not find a unique interpretation of the association between auditor independence and provision of NAS. Our findings reveal that auditor independence, as measured by the magnitude of discretionary accruals, is compromised by the provision of NAS, especially when unexpected audit fees are lower than expected. Enhanced credibility can lead to greater confidence in audit value. This study's results should be of interest to European and U.S. legislators, to improve financial reporting quality.

Originality/value – In the wake of the global financial crisis and loss of confidence in the role of auditors, this study investigates the supposed threats, to aim to enhance the credibility of and confidence in audit quality, especially in settings outside the Anglosphere. This study would contribute to the literature to support the more binding approach for audit firms.

Keywords: audit credibility, audit fees, audit market regulation, audit quality

Paper type: Research paper

JEL Classifications: M410; M480; G38, G28

1. Introduction

The aim of this research is to examine the independence of audit firms, with particular regard to the possibility of providing non-audit services (NAS). This is a widespread practice both in SMEs and in large companies, which the European Union and the Member States have tried to restrict by setting constraints to protect the formal and substantial independence of auditors, a fundamental requirement for accepting and subsequently retaining their mandate.

In recent decades, companies have increased their demand for NAS from auditing firms, as evidenced by the increasing income from “non-core business” operations of the Big 4 and, subsequently, all other audit firms. Consulting audit firms' “transparency reports” has made possible analysis of the revenues of the main audit firms in Italy.

The concept of NAS includes all those services provided by the audit firm that do not relate to the auditing. There is only a potential threat to independence if the auditor (or their professional network) provides NAS to the direct clients and, to a lesser extent to their subsidiaries and associated companies. It is for this reason, therefore, that this research considers potential threats to the independence of an auditor who provides both

auditing and NAS to the same client.

Concerning the principle of independence, it is necessary to stress the reporting requirements that both companies and audit firms must fulfill, especially on the subject of NAS. There are, in fact, qualitative limits and quantitative thresholds that must necessarily be respected. The Committee of European Auditing Oversight Bodies (CEAOB) which aims to strengthen audit oversight and quality across the EU, published in 2018, among others, guidelines on monitoring the cap on fees from NAS⁽¹⁾, in compliance with the European Regulation 537/2014 (art. 4, par. 2).

Since the European Union started to impose stricter rules on auditor independence, there has been a mitigation of such limitations through the constitution (by the audit firms) of legal and tax consultancy companies (formally detached from the main firm). Although formally complying with the constraints of EU regulation, it is here, therefore, that further doubts may arise as to whether the independence of the auditor is threatened.

The financial crisis in 2008 induced reactions on EU level and resulted in further restrictions regarding the provision of NAS to audit clients of public-interest (public-interest entities, PIEs). The 2014 Regulation introduced a blacklist that prohibits the provision of specific NAS and set a cap for non-audit fees at 70% of audit fees, based on a 3-year average. Under certain conditions, Member States were allowed to deviate from the blacklist and to permit the provision of some selected tax and valuation services, respectively to prohibit further NAS beyond the black list.

The aim of the research is not to verify whether all auditors (or audit firms) comply with the imposed independence constraints but rather to verify, through quantitative analysis, whether regardless of the imposed limitations, the provision of NAS constitutes a threat to auditor independence. Undoubtedly, the potential threat to independence arises from the personal interest (or the interest of the professional network to which one belongs), not to lose the revenue from the provision of NAS.

Following this path of investigation, the research focused on three elements of determinations: first, the unexpected audit fees, then the discretionary accruals, and finally, the judgment on the auditor's independence.

2. Background and Hypothesis Development

It is generally accepted that the disclosure of audit fees and NAS in financial statements can help stakeholders to form an opinion on auditor independence.

Within the various research methods, the dependent variable on which attention is often focused is earnings management. A common aspect of most research, in fact, is to consider earnings management, which generates discretionary accruals (*i.e.*, discretionary management of earnings – for instance, earnings increase or decrease, income smoothing, and so on), as a proxy to express a judgement on auditor independence and therefore as a factor of audit quality (Akther and Xu, 2021; Azzali and Mazza, 2013; Mazza *et al.*, 2014; Corbella *et al.*, 2015; Mazza and Azzali, 2015; 2018). In other words, this practice can be defined as the discretion (potentially opportunistic) that management appreciates in applying the principles of valuation of patrimonial items to achieve a preferred economic income, with the last (but not least) effect of lowering the quality of income (*i.e.*, dirty income) (Kinney *et al.*, 2004).

The following are the main references in the literature on which this research is based, to define the research method.

Ianniello (2013) gives evidence that, although it is difficult to find a statistically significant association between the provision of NAS and auditor independence, a convincing argument can be made for the existence of several risks, arguing that when an incumbent auditor provides NAS, the auditor's monitoring value decreases (Ianniello, 2013). Therefore, the perception of auditor independence (Beattie *et al.*, 1999; Krishnan *et al.*, 2005) and the appearance of earnings quality may be adversely affected (Iyengar and Zampelli, 2008).

Previously, Dechow *et al.* (2010) identified a mixed relationship between audit fees and earnings quality, which strongly depends on the type of fees, the companies sampled, and the specific measure of accruals.

Since audit and NAS fees must be disclosed in the notes to the financial statements, the behavior of corporate governance bodies may be influenced by trying to avoid certain conduct, including the purchase of NAS, which could appear to an informed third party as threatening the auditor's independence (Gaynor *et al.*, 2006).

Finally, Ianniello notes a positive relationship between the provision of NAS and earnings management.

¹ CEAOB (2018). Guidelines on “Monitoring the fee cap of non-audit services.”

Alexander and Hay (2013), on the other hand, conducted a study on NAS based, first, on the frequency with which NAS is provided, dividing it into “recurrent” and “non-recurrent”. This research is based on the earlier results of Simunic (1984), who stated that firms that purchase NAS from the auditor are systematically different from those that do not. The next step, testing the correlation between non-recurring NAS and audit fees, led to the conclusion that independence was not compromised.

Campa and Donnelly (2016), assume that the provision of NAS negatively conditions both aspects of auditor independence (*i.e.*, independence in fact/of mind and independence in appearance).

It is assumed that the fees earned from these activities may make auditors more permeable, thus allowing clients to carry out certain practices and behaviors that would otherwise be reported to stakeholders (Francis, 2006). Consequently, stakeholders would certainly be skeptical about the independence of the audit relationship when they know that the auditors themselves provide a significant amount of NAS to clients (Quick and Warming-Rasmussen, 2009).

Furthermore, according to Campa and Donnelly, there are two reasons why auditor independence may be compromised by the provision of NAS: the first is that the role of the auditor is fundamentally changed from that of an independent outsider to that of an internal consultant; the second is that the fee earned creates an economic link between the auditor and their client (Beattie and Fearnley, 2002; Francis, 2006).

In this regard, other authors point out that regulators and standard setters are concerned that the provision of NAS may compromise auditor impartiality by increasing economic dependence on the client (Lopez Gavira *et al.*, 2013) and, consequently, familiarity and trust, creating complicated situations in terms of self-review threat⁽²⁾.

The authors also identify a group of studies that highlight that the provision of NAS to audit clients has positive effects on the quality of client financial reporting, including those of Kinney *et al.* (2004); Antle *et al.* (2006); Huang *et al.* (2007); Paterson and Valencia (2011); and Svanstrom (2013). This may result in the increased knowledge gained through the provision of NAS that enables the auditor to use this new information to conduct a more effective audit (Krishnan, *et al.*, 2011).

Assuming, therefore, that the simultaneous provision of audit services and NAS compromises the auditor's independence of mind (particularly for companies with low levels of unexpected audit fees: Larcker and Richardson, 2004; Gupta, *et al.*, 2011), the results indicate that the auditor's independence, as measured by the size of discretionary accruals (output of the earnings management process) is compromised by the provision of NAS, mainly when audit expenditure is lower than expected (Campa and Donnelly, 2016). Unexpected is the portion of audit fees that exceeds the expected normal level, as calculated by reference to the size, risk, and complexity of the audited company (Eshleman, 2014).

Hohenfels and Quick (2018) believe that the provision of NAS can improve audit effectiveness, as knowledge gained from advisory services could be transferred to the audit, forming a kind of economy of scope. Increased audit effectiveness, achieved through knowledge spillover effects, could in turn lead to higher audit quality as the auditor's expertise increases (Joe and Vandervelde, 2007). This would also allow the auditor to perform audit functions at a lower cost (Antle *et al.*, 2006).

Finally, the research by Meuwissen and Quick (2019) deserves special mention for its involvement of a psychological as well as an economic perspective. Following the previous article by Hohenfels and Quick, the authors identify the knowledge spillover of the NAS as the key factor in reducing audit fees at the expense of auditor independence (Ostrowski and Söder, 1999). These findings imply that improving the accounting knowledge of members of the audit committee will reduce the gap in auditor expectations (Meuwissen and Quick, 2019).

Starting from these references, the paper is based also on the regulatory references, both at the EU and national level, namely Directive 2006/43/EC (and Italian Decree 39/2010) EU Regulation 537/2014, as well as the more recent Directive 2014/56/EU (and Italian Decree 135/2016).

The majority of existing studies addresses the U.S. setting. Albeit, audit market concentration and audit fees are comparably high in Italy and some other EU Member States, the U.S. setting exhibits substantial differences in the audit environment. The Italian manufacturing sector is one of the predominant industries in the Continental European economy system. Besides differing corporate governance systems, especially different regulations to

² European Commission (2002, May 16). Commission Recommendation on Statutory Auditors' Independence in the EU: A Set of Fundamental Principles.

ensure audit quality exist, which causes those results from U.S. studies are not generalizable to Italy or other Continental European countries. This is especially true in an environment such as Italy, where the ownership of listed companies is highly concentrated and where the agency problem often arises. Italy can be classified in the group of civil law countries, with weak investor protection and enforcement regulation and low litigation risk for directors and auditors and between controlling and minority shareholders. The Italian capital market consists of a relatively large proportion of firms that have concentrated ownership.

In this study, we contribute to the audit research literature by analyzing the impact of NAS on audit quality in the Italian setting. The Italian setting is important as Italy is characterized by one of the largest audit market for companies within the EU Member States. Furthermore, it offers greater incentives for an impairment of auditor independence in comparison to Anglo-American countries as litigation risk for auditors is low and public oversight of auditors is only modest.

The research hypothesis aims to reply the following consideration:

H: The simultaneous provision of auditing and NAS compromise the auditor's independence of mind.

3. Sample and data. Research Design

The research methodology is based on the above-mentioned reference literature, with the aim of expressing a valuation on the "independence of mind" of the auditor (or audit firms), based on discretionary accruals (output of the earnings management process) and, of course, on NAS.

To test our hypothesis, we focused on the population of 91 non-financial companies listed on the Milan Stock Exchange (Mercato Telematico Azionario, Borsa Italiana's Main Market) as of December 31, 2019. We then extended our sample backwards, to 2015.

We manually collected data about audit from corporate annual audit reports and shareholders' meeting reports available on the Borsa Italiana website or directly from the company's website. We also manually collected audit fee data between 2015 and 2019 from shareholders' meeting reports and from annual reports. Finally, we downloaded accounting data for the period 2015-2019 from the AIDA database, which contains financial information for both listed and unlisted companies in Italy.

By means of a multiple linear regression statistical model, we aim to describe the relationship between a) discretionary accruals (output of the earnings management process) and b) the other variables defined as affecting them, also in light of the information acquired in the literature review (mainly Campa and Donnelly, 2016). These include, in particular, NAS, unexpected audit fees, and other variables that express the income and patrimonial and financial balance of the companies, as illustrated in the following paragraph (with a description in the Appendix).

A limitation of this study is the use of earnings management (abnormal accruals) as a proxy for audit quality. As with all studies that use this proxy for audit quality, reported financial statements are a joint product of the company management and the audit firm and, therefore, we are not able to isolate the effects of a company's financial reporting quality from the audit quality itself. As with all studies that use this measure, we cannot observe earnings quality directly, however, we do use estimates calculated by different models in this study.

The method design was basically divided into three steps, of which the first two were necessary to obtain two new variables (as residuals of the first regression models) considered within the third regression model, which allows the subsequent assessment of the threats to the independence of the auditor who provides NAS to clients (for whom he also holds the audit engagement). In particular, the first relates to the estimation of unexpected audit fees, whereas the second relates to the identification of discretionary accruals that measure earnings management. Both have the main purpose of providing new variables that will be used in the third regression model. Therefore, the unexpected audit fees constituted a new regressor, whereas the discretionary accruals represented the dependent variable for which we want to investigate the existence of a functional relationship with the other independent variables. It is through the third and last regression model that it would be possible to identify, on the basis above mentioned, the possible relationship between NAS and the auditor's independence of mind, as well as the reasons leading to a greater compromise of the same.

To identify unexpected audit fees according to the survey model presented by Campa and Donnelly (2016), we first followed the recommendations of Francis and Ke (2006), who argued that the use of the monetary amount of NAS is preferable to the NAS ratio (*i.e.*, measured as the ratio of NAS to total fees paid to the auditor), as this value may better reflect the deterioration of auditor independence resulting from the stronger economic link generated by the provision of such other services (Francis and Ke, 2006).

Then, adopting an approach similar to that of Larcker and Richardson (2004), first, and Gupta *et al.* (2011), we estimated the normal level of audit fees, which allowed us to identify the unexpected fees as residuals of the following regression model, taking into account individuals i and time periods t :

$$\begin{aligned} Auditor_{it} = & \beta_0 + \beta_1 NonBig4_{it} + \beta_2 Size_{it} + \beta_3 M\&A_{it} + \beta_4 MTB_{it} + \beta_5 Lev_{it} + \beta_6 ROA_{it} + \beta_7 Arinv_{it} \\ & + \beta_8 Zscore_{it} + \beta_9 FYE3112_{it} + \beta_{10} Intang_{it} + \beta_{11} NegROA_{it} + \beta_{12} LnAge_{it} \\ & + \beta_{13} Growth_{it} + \varepsilon_{it} \end{aligned}$$

The dependent variable *Auditor* represents, therefore, the total amount paid to the auditor, both for audit services and for NAS. The independent variables, on the other hand, are intended to provide the best numerical expression of the expected fee, which is represented by the combination of size, risk, and complexity factors of the company considered (See the descriptions in the Appendix).

Following the reference literature, we assume that positive unexpected audit fees are indicative of a higher quality audit, capable of conditioning the NAS fees and, therefore, the auditor's independence. By analysing the residuals of this regression model, we therefore can propose an accurate estimate of unexpected audit fees.

Table 1 presents the results of the first regression model.

Table 1. Summary of First Regression Model

	Estimate	Std. Error	t-value	Pr(> t)	
<i>(Intercept)</i>	- 10.366000	0.971660	- 10.66840	0.00000001	***
<i>NonBig4</i>	0.905080	0.249130	3.63300	0.00032610	***
<i>Size</i>	0.605330	0.046813	12.93070	0.00000001	***
<i>M&A</i>	- 0.392040	0.183270	- 2.13920	0.03317490	*
<i>MTB</i>	- 0.003873	0.001749	- 2.21440	0.02750310	*
<i>Lev</i>	- 0.007836	0.024478	- 0.32010	0.74908230	
<i>ROA</i>	- 0.007909	0.009799	- 0.80720	0.42016320	
<i>Arinv</i>	- 0.002012	0.012046	- 0.16700	0.86744270	
<i>Zscore</i>	- 0.065839	0.039210	- 1.67910	0.09409920	.
<i>FYE3112</i>	0.146470	0.299100	0.48970	0.62467630	
<i>Intang</i>	- 1.420400	0.758410	- 1.87290	0.06198530	.
<i>NegROA</i>	0.574290	0.196130	2.92810	0.00365370	**
<i>LnAge</i>	- 0.310190	0.103860	- 2.98670	0.00303670	**
<i>Growth</i>	0.000151	0.008274	0.01830	0.98542790	
R-Squared:	0.3639				
Adj. R-Squared:	0.3381				

The expected audit fee is defined by that amount whose value is based on the combination of the size, risk, and complexity factors of the client company. The "unexpected" audit fee, therefore, by difference (residual), is that portion of the fee paid to the auditor that is not justified by the above reasons and, therefore, affects the auditor's independence of mind.

In light of the estimated coefficients and their associated p -values, the independent variables *NonBig4*, *Size*, *NegROA* and *LnAge* are particularly significant and noteworthy.

Once the unexpected fees were identified, an analysis of the fees as residuals of a regression model followed⁽³⁾.

It has already been mentioned that several authors use "earnings management" as a proxy to express a judgment about the auditor's independence of mind. The next step, therefore, following the studies carried out first by McNichols (2002) and then by Campa and Donnelly (2016), consists in estimating the discretionary accruals, the output of the earnings management process, estimated as residuals of the following multiple regression model:

$$\Delta WC_{it} = \beta_0 + \beta_1 CFO_{it} + \beta_2 Growth_{it} + \beta_3 Property_{it} + \varepsilon_{it}$$

The dependent variable ΔWC indicates the change in operating net working capital (operating NWC) in relation to the previous year's total assets. The numerator expresses, in fact, the ability of management to generate, in a given year, cash or liquid assets with a short term (See in the Appendix a brief description of the independent variables).

³ The analysis of residuals is one of the essential parts necessary to validate a regression model. Table 2 in the Appendix summarises the main position indices (minimum, maximum, mean, median, and 1st and 3rd quartiles) relating to the residuals of the regression.

To clarify the mechanism of this regression model, it should be specified that the discretionary accruals, used as a proxy to express a judgment on the independence of mind, are estimated as the error that the operating cash flow, the annual variation of sales, and the fixed assets make in the attempt to explain the annual variation of operating *NWC* compared with the total assets.

For this reason, the residuals of this model (*i.e.*, discretionary accruals) can be interpreted as discretionary items that can potentially alter the true business reporting.

Table 3 presents the results of the second regression model.

Table 3. Summary of Second Regression Model

	Estimate	Std. Error	t-value	Pr(> t)	
<i>(Intercept)</i>	- 0.017511	0.014392	- 1.21670	0.224578300	
<i>CFO</i>	0.539091	0.088926	6.06320	0.000000004	***
<i>Growth</i>	- 0.042659	0.012649	- 3.37250	0.000833300	***
<i>Property</i>	0.327307	0.054277	6.03030	0.000000004	***
R-Squared:	0.9503				
Adj. R-Squared:	0.9498				

As described above, discretionary accruals are estimated as the error that operating cash flow, annual change in sales, and fixed assets make in trying to explain the ratio between the annual change in operating *NWC* and total assets.

Indeed, looking at the R-squared index⁽⁴⁾ of around 95%, it is possible to understand how this definition is really based on solid reasons. In this case, therefore, the independent variables can explain 95% of the dependent variable⁽⁵⁾.

Focusing on the results of this regression model, one can observe the high significance of all regressors. This means that the *CFO*, *Growth* and *Property* variables accurately explain (and are able to predict) the annual variation (*i.e.*, the increase or decrease from one year to the next, of the operating *NWC* expressed in percentage terms through the ratio to total assets). The logic of this equation can be identified as follows: first, cash flow (*CFO* variable), flowing into cash and cash equivalents, and therefore into short-term assets, contributes positively to the variation in working capital. Moreover, the annual change in sales (*Growth* variable) positively affects the net operating working capital through its natural generation of short-term receivables from customer companies. Finally, the *Property* variable, which represents tangible fixed assets, although it does not contribute directly to the change in working capital (in general, not only operational), was nevertheless used, as also illustrated by Campa and Donnelly (2016) and by Svanstrom (2013), as it is linked to the theme of discretionary accruals (residuals of this regression model) through depreciation and amortization.

As the results show, it is possible to state that the variables are largely sufficient to express an accurate estimate of the change in net operating working capital.

What will deviate from this estimate (or forecast), therefore, will be defined as error (residual) and will constitute, therefore, the discretionary accruals.

Returning, therefore, to the main objective of this regression model, the residuals allow identification of the discretionary accruals, which are fundamental to express a judgment on the auditor's independence of mind.

In particular, the regression model just analysed made it possible to identify, through the analysis of the residuals, precisely the intensity with which the defined firms carried out earnings management. It should be noted that earnings management can be both upward and downward.

On the basis of what is shown in Table 4, in which the most significant results are reported (estimates of the residuals of the second regression model), the companies appearing on the left-hand side of the table, through earnings management, would have communicated in their financial statements a higher operating result. On the contrary, the companies on the right side would have reported a lower income result.

⁴ The coefficient R^2 represents the variation in the values of y that can be justified by the variation in x .

⁵ R^2 is statistically significant since the p -value associated with the f -statistic is represented by a value very close to zero ($< 2.22e-16$).

Table 4. Estimates of the Most Relevant Discretionary Accruals (Residuals of the Second Regression Model)

Positive Discretionary Accruals ⁶		Negative Discretionary Accruals ⁷	
Firm-year	Value	Firm-year	Value
<i>EEMS Italia - 15</i>	3.083420	<i>Costamp Group - 18</i>	-1.149869
<i>Enertronica Santerno - 17</i>	0.587388	<i>Vianini - 16</i>	-0.428021
<i>Officina Stellare - 19</i>	0.517438	<i>Enertronica Santerno - 15</i>	-0.415799
<i>Esautomotion - 18</i>	0.501399	<i>F.I.L.A. - 15</i>	-0.346175
<i>Antares Vision - 18</i>	0.483839	<i>Carel Industries - 18</i>	-0.332389
<i>Enertronica Santerno - 16</i>	0.440550	<i>Energica Motor - 18</i>	-0.317629

These new values, following first McNichols (2002) and then Campa and Donnelly (2016), provide an index expressing the extent to which companies use earnings management. In particular, this index estimates, in relative terms, the ratio between the operating result declared by the company and the one identified through the residuals of the second regression.

The third and last step is to identify a relationship between *NAS* and the auditor's independence of mind using discretionary accruals. In this regard, following the example of Campa and Donnelly (2016), a further multiple regression model is proposed that presents, among others, variables from the first and second regression models:

$$DiscAccruals_{it} = \beta_0 + \beta_1 LnNas_{it} + \beta_2 UnexpAuditDummy_{it} + \beta_3 LnNas * UnexpAudit_{it} + \beta_4 NonBig4_{it} + \beta_5 CFO_{it} + \beta_6 Lev_{it} + \beta_7 Size_{it} + \beta_8 Dissue_{it} + \beta_9 Growth_{it} + \varepsilon_{it}$$

The dependent variable *DiscAccruals* (i.e., discretionary accruals), is represented, therefore, by the vector of residuals generated by the second regression model. The aim is, therefore, to estimate a possible functional relationship existing between this dependent variable and the other independent variables (See in the Appendix the description of the new variables that were not used in the previous two models).

Table 5 presents more significant results.

Table 5. Synthesis of Results of Third Regression Model

	Estimate	Std. Error	t-value	Pr(> t)
<i>(Intercept)</i>	0.396620	0.173290	2.28870	0.022736000 *
<i>LnNas</i>	0.003702	0.003164	2.27045	0.023984000 *
<i>UnexpAuditDummy</i>	-0.093284	0.040263	-2.31690	0.021132000 *
<i>LnNas*UnexpAudit</i>	0.005964	0.004397	1.35660	0.175857000
<i>NonBig4</i>	-0.038835	0.039772	-0.97640	0.329573000
<i>CFO</i>	0.557090	0.107780	5.16870	0.000000413 ***
<i>Lev</i>	0.010492	0.003990	2.62950	0.008958000 **
<i>Size</i>	-0.019840	0.008921	-2.22400	0.026836000 *
<i>Dissue</i>	0.000083	0.000016	5.19110	0.000000369 ***
<i>Growth</i>	-0.067374	0.012976	-5.19200	0.000000368 ***
R-Squared:	0.1220			
Adj. R-Squared:	0.0977			

Considering the *p*-values obtained and the relationships with the discretionary accruals, we may conclude the particular significance of the variables *CFO*, *Dissue*, *Growth*, *Lev*, *UnexpAuditDummy*, *Size* and *LnNas*.

The significance of the other regressors, in light of the *p*-values obtained during the estimation, finally allow us also to determine the main factors that can affect the auditor's independence of mind, in turn measured according to the discretionary accruals.

For further descriptions, please see the Appendix, Tables 6-8 and Figures 1-3.

4. Empirical Results

To deepen the research hypothesis (*H*), we propose the β_1 and β_3 coefficients estimated by the third regression model, designed to capture the relationship between *NAS* and the auditor's independence of mind. These are the coefficients identified for the two variables *LnNas* and *LnNas*UnexpAudit*.

In particular, if the coefficient β_1 is positive (if negative), it is inferred that the supply of *NAS* decreases (increases) audit quality, given that profit management increases (decreases) as the fees for *NAS* increase. Furthermore, the sum of the coefficients β_1 and β_3 with a positive result would suggest that the provision of

⁶ Observations with values greater than 0.3 are given below.

⁷ Observations with values greater than 0.4 are given below.

NAS compromises the auditor's independence of mind, regardless of the size of the audit fees (Campa and Donnelly, 2016).

The values in Table 9 in bold, therefore, are those necessary for the final assessments, as we have indicated.

Table 9. Significant Results of Third Regression Model

Regressor	Estimated Coefficient (β)
1. <i>LnNas</i>	0.003702
2. <i>LnNas * UnexpAudit</i>	0.005964
Tot.:	0.009666

In particular, the coefficient (β_1) of the *LnNas* regressor, equal to 0.003702, implies, as mentioned, that the offer of NAS to audit clients impairs audit quality, as discretionary accruals seem to increase as NAS fees increase. In other words, considering the sample observed, it appears that as NAS fees increase, so do the earnings management policies of the companies⁽⁸⁾. This would potentially pose a threat to independence, as it would appear that higher NAS fees (paid by PIEs to their audit firms) would allow management to draw up financial statements with greater discretion (through earnings management).

The second assessment, the sum of the coefficients (β_1 and β_3) of the *LnNas* and *LnNas*UnexpAudit* regressors, which is 0.009666, would suggest that the provision of NAS always compromises the auditor's independence of mind, irrespective of the level of audit fees. This result, which is much more general than the previous one, therefore indicates that, irrespective of how much a company pays for the auditing, the auditor's provision of NAS always poses a threat to their independence, particularly with regard to the risk of self-review, familiarity, or over-reliance, in addition to the more obvious financial independence aspect. These results are based on a regression model that identifies discretionary accruals as a dependent variable. As mentioned previously, discretionary accruals can be either positive or negative, depending on the underlying reasons for earnings management. Thus, a positive value is given when the objective is to show a higher income and vice versa.

Following the research methodology defined by Campa and Donnelly (2016), the discretionary accruals directly obtained from the vector of residuals of the second regression model were considered. In this perspective, therefore, it was considered appropriate to verify any changes in the results outlining, rather than the original values obtained previously, the intensity of earnings management, that is, by resorting to the absolute value of discretionary accruals. In a simplified manner, the modulus function (absolute value) is applied to the dependent variable *DiscAccruals*, which makes it possible to identify the intensity of earnings management, irrespective of the motivations (*i.e.*, sign) that lead to its implementation. Proceeding, we obtain the new dependent variable *AbsDiscAccruals*, and the regression model becomes, therefore, the following:

$$\begin{aligned}
 AbsDiscAccruals_{it} &= \beta_0 + \beta_1 LnNas_{it} + \beta_2 UnexpAuditDummy_{it} + \beta_3 LnNas * UnexpAudit_{it} \\
 &+ \beta_4 NonBig4_{it} + \beta_5 CFO_{it} + \beta_6 Lev_{it} + \beta_7 Size_{it} + \beta_8 Dissue_{it} + \beta_9 Growth_{it} + \varepsilon_{it}
 \end{aligned}$$

The results obtained after this last change are shown in Table 10.

Table 10. Synthesis of Results of Third Regression Model with AbsDiscAccruals

	Estimate	Std. Error	t-value	Pr(> t)	
(Intercept)	0.723420	0.152790	4.73460	0.00003282	***
<i>LnNas</i>	0.002008	0.002789	2.61875	0.009243000	**
<i>UnexpAuditDummy</i>	- 0.092584	0.035500	- 2.60800	0.009528000	**
<i>LnNas*UnexpAudit</i>	0.006076	0.003876	1.56750	0.117969000	.
<i>NonBig4</i>	- 0.066107	0.035507	- 1.88520	0.062990000	.
<i>CFO</i>	0.459170	0.095032	4.83170	0.000002090	***
<i>Lev</i>	0.015317	0.003518	4.35380	0.000017950	***
<i>Size</i>	- 0.033268	0.007866	- 4.22950	0.000030490	***
<i>Dissue</i>	0.000068	0.000014	4.82690	0.000002137	***
<i>Growth</i>	- 0.055474	0.011441	- 4.84850	0.000001932	***
R-Squared:	0.1698				
Adj. R-Squared:	0.1468				

Considering the absolute value of discretionary accruals, one can observe results that are clearly more significant than the previous ones. In particular, there are increases in materiality for the regressors *LnNas*, *UnexpAuditDummy*, *NonBig4*, *Lev* and *Size*. This indicates, therefore, the greater ability of this regression model

⁸ With regard to the companies in the sample analyzed, all the reports of the auditing firms present a positive and unqualified opinion.

to identify a relationship between the intensity of earnings management (*i.e.*, absolute value of discretionary accruals) and the various independent variables considered within the model.

The main difference with respect to the previous regression model, in terms of results, is also recorded with reference to the *NonBig4* regressor. In this regard, although the materiality is not particularly relevant, it is possible to interpret these outputs as the tendency of discretionary accruals (in absolute value) to increase when the auditing is entrusted to a Big 4. This would mean, in other words, that the Big 4 grants greater autonomy in terms of earnings management, which allows the board of directors to approve, with a positive opinion from the same auditing firm, financial statements containing greater discretionary accruals and potentially distortions of the transparency.

Now, it is appropriate to compare our results with those obtained by the various authors mentioned in the literature review, which also formed the basis of the method. The results of Ianniello (2013), Campa and Donnelly (2016), Hohenfels and Quick (2018), and Meuwissen and Quick (2019) appear consistent with those obtained here.

5. Conclusion

This research is based on the international literature, thanks to which it has been possible to develop a broad background, highlighting that the context and the period of reference are essential and distinctive factors of each investigation. Extensive emphasis has already been given to the main references, on which the present research is based, namely Ianniello (2013), Campa and Donnelly (2016), and Meuwissen and Quick (2019).

Through these studies, a research method based on three interconnected regression models was identified. The first aimed to estimate the functional relationship between the fees paid to the auditor and all those values underlying the theoretical fee that a firm should pay, represented by the combination of size, risk and complexity factors of both the target firm and the auditing engagement itself. The residual (ϵ), therefore, represented the unexpected audit fee (*i.e.*, not justified by normal audit pricing criteria). The second regression model, on the other hand, aimed to identify discretionary accruals, estimated as the error made by operating cash flow, annual change in sales, and fixed assets in trying to explain the annual change in operating working capital relative to total assets. The last regression, using the previously estimated discretionary accruals, enabled us to identify the relationship between the provision of NAS and the auditor's independence of mind, as well as to analyze the way in which the different variables contributed to provide an explanation from a statistical approach.

The results of the statistical survey conducted in context of the Italian manufacturing between 2015 and 2019, showed, in a manner consistent with some of the research proposed in the literature review, that NAS always undermines auditor independence of mind, regardless of what quantitative limit is imposed.

The same results also established that the provision of NAS to audit clients impairs audit quality, thus not identifying the knowledge *spillover* from the provision of NAS as a factor in raising audit quality.

Further general conclusions can be drawn from interpreting of the results of the third regression model, *i.e.*, an increase in discretionary accruals could be observed when increasing not only NAS but also operating cash flow and debt (confirmed twice, both by the *Growth* and *Lev* variables). On the other hand, discretionary accruals seem to decrease as size and annual change in revenues increase. These latter results would lead to the following conclusions: smaller companies, which purchase larger quantities of NAS and which present an adequate financial structure (but with a slight tendency towards indebtedness) and a positive growth trend in operating cash flow, seem to operate greater discretionary accruals than other companies. However, a situation of constant revenue growth from one year to the next seems to negatively affect (reduce, but never eliminate) this phenomenon.

It would certainly be interesting, at this point, to further deepen the research by also trying to analyze companies and entities (not listed and not of public interest), to better understand how the present results vary, for example also considering SMEs or financial companies. In this regard, it is worth repeating that the results obtained here show more criticalities with reference to smaller companies; and for this reason, a further investigation in this regard would be opportune; the aim would be to understand how, regardless of the limitations imposed at the regulatory level, auditors and auditing firms tend to be negatively affected by the provision of NAS to even smaller clients, SMEs. This was not possible here, mainly due to the non-availability of data.

This study examines this question in the unique environment of a country, Italy, with a long tradition of civil law with low litigation risk for directors and auditors and between controlling and minority shareholders, with the goal of informing the discussion related to the audit quality elsewhere in the world. Also, for this reason, these results should be interesting to policy setters and regulators as the European Parliament, the U.S. House of

Representatives, the GAO, and academic researchers.

In conclusion, there are many different interpretations in the literature: some studies conclude that independence is compromised, whereas others conclude in the opposite direction, even considering NAS as an element that can increase audit quality through the knowledge spillover resulting from the provision of such additional services. This paper aims to contribute to the literature to support the less conservative approach for audit firms.

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Appendix

Descriptive variables

In this regard, the following variables were considered in the *first* regression model:

NonBig4: dummy variable that takes the value 1 when the audit is not performed by a *Big 4* firm. This is the only variable within the multiple regression model that does not directly provide a link with the previous definition of expected fee, but which we decided to consider anyway. This is because companies of this size (*Big 4*) often present such advanced information systems, technologies and methodologies that allow, on the one hand, to simplify the audit work that, therefore, affects the complexity of the assignment, and, on the other hand, to directly affect the final amount, allowing the *Big 4* to charge the client also the fees for the use of such technologies. A further aspect to be considered, moreover, is the contractual strength of a large audit firm, which allows a general increase in fees;

Size: a variable intended to summarise the size of the company, being the natural logarithm of total assets;

M&A: a dummy variable that assumes value 1 when the company completes a merger or acquisition operation;

MTB: variable expressing the market to book value, *i.e.* the ratio between market value and book value of shareholders' equity;

Lev: variable that expresses leverage, *i.e.* the leverage ratio of a company;

ROA: variable that expresses the return on assets of a company;

Arinv: variable that expresses the ratio between the sum of receivables and inventories, and total assets at the beginning of the year; it is a variable that can provide information about the size of the company, as well as about the risks (Campa and Donnelly, 2016);

Zscore: a variable that expresses the probability of default of a company, based on a statistical approach by Zmijewski (1984) that combines different capital, economic and financial ratios (compare also the design in Campa and Donnelly, 2016);

FYE3112: a dummy variable that takes the value 1 when the end of the fiscal year is 31 December;

Intang: variable that expresses, in percentage terms, the amount of intangible assets within the balance sheet assets;

NegROA: dummy variable that takes on a value of 1 when the return on assets is negative;

LnAge: variable indicating, through natural logarithm, the age of the company;

Growth: variable that identifies the annual change in sales compared to total assets at the beginning of the year.

The following variables were considered in the *second* regression model:

CFO (Operating Cash Flow) expresses the annual cash flow deriving from the characteristic management related to the total assets at the beginning of the year;

Growth, as in the previous model, indicates the annual variation of sales related to the total assets at the beginning of the year;

Property, finally, represents the ratio between the sum of fixed assets and the total assets at the beginning of the year.

The following variables were considered in the *last* regression model:

LnNas: variable indicating, by natural logarithm, the fees paid for the provision of *NAS*;

UnexpAuditDummy: dummy taking value 1 in case of positive unexpected non-audit fees;

*LnNas*UnexpAudit*: variable expressing the product of the two previous regressors; it is able to capture the difference in the impact of non-audit fees when audit fees are unexpectedly high (instead of unexpectedly low);

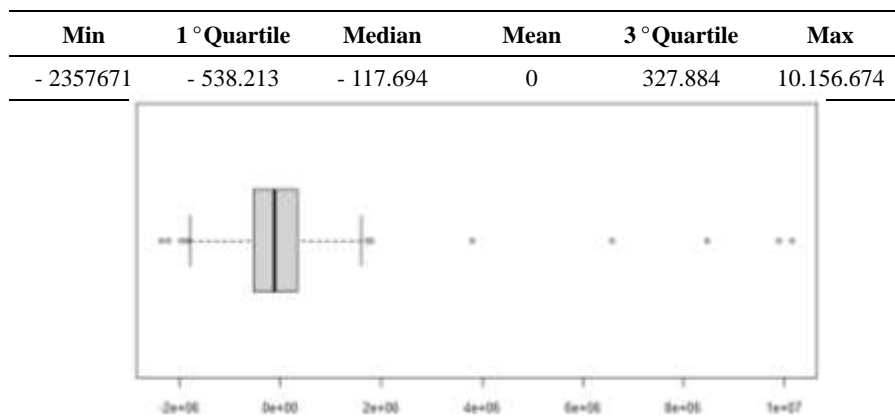
Dissue: variable expressing, in percentage terms, the annual change in debts.

Table 2 below summarizes the main position indices (minimum, maximum, mean, median, 1st and 3rd quartiles) relating to the residuals of the regression, which will constitute one of the two factors underlying the variable $LnNas * UnexpAudit_{it}$, present in the third regression model. Using this information, it was also possible to represent the *boxplot*⁹ of the *unexpected audit fees*.

⁹ Within the boxplot, the data is divided by 1000 for a better visual representation of the data.

LnNas*UnexpAudit_it, boxplot of the unexpected audit fees.

Table 2. Position Index of the Vector of Residuals of the First Regression Model and its Boxplot



Starting with audit fees, the first step was to identify the main position indices, such as minimum, maximum, first and third quartiles, mean and median. Table 6 shows these values with reference to the audit fees incurred by companies in the five-year period 2015 to 2019.

Table 6. Audit Variable Position Indices - own processing

Position index	Audit 2015	Audit 2016	Audit 2017	Audit 2018	Audit 2019
Min.	15.200	25.000	11.500	11.000	3.000
1° Quart.	62.000	57.850	59.000	40.250	40.000
Median	102.000	107.000	110.000	87.000	77.750
Mean	375.100	329.130	327.700	310.620	215.540
3° Quart.	164.200	162.750	170.000	159.500	146.000
Max.	13.959.000	9.800.000	11.065.000	13.154.000	7.490.000

In particular, focusing on the minimum and maximum fees for each year, it can be observed that there appears to be a downward trend in audit fees. These position indices, in fact, decrease drastically over the period observed; from 2015 to 2019, in fact, there is -80.26% for the minimum fee and -46.34% for the maximum fee.

However, in order to verify the real existence of this trend, it is necessary to pay attention to the arithmetic averages of the distributions, represented in the following *Figure 1* for a better understanding.

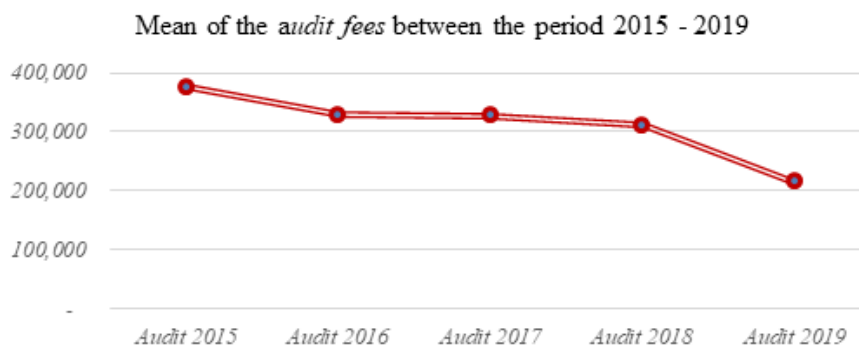


Figure 1. Average Evolution of the Variable Audit - own processing

With reference to audit fees, it can be concluded that, between 2015 and 2019, there has been a drastic reduction in them, which in percentage terms amounts to -42.54%.

Turning our attention now to the NAS, we take the same approach to highlight any increasing or decreasing trends. Table 7 therefore contains the position index values for the distribution of NAS paid by the sample companies between 2015 and 2019.

Table 7. NAS Variable Position Indices - own processing

<i>Position index</i>	Nas 2015	Nas 2016	Nas 2017	Nas 2018	Nas 2019
<i>Min.</i>	0	0	0	0	0
<i>1 * Quart.</i>	0	0	0	0	0
<i>Median</i>	5.500	12.000	20.000	18.000	20.000
<i>Mean</i>	68.180	105.000	79.180	92.400	72.660
<i>3 * Quart.</i>	80.500	89.000	60.000	93.250	43.750
<i>Max.</i>	804.000	1.425.000	1.418.000	1.349.000	1.000.300

Based only on the maximum values of the distributions, it is not possible to accurately identify either a growth or a reduction in *NAS* (See Figure 2 here below). However, what can be defined with certainty is the change between 2015 and 2019, *i.e.* + 6,57%.

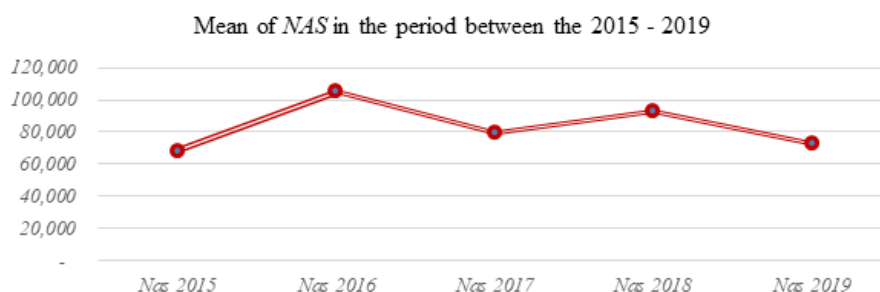


Figure 2. Average Development of the *NAS* Variable - own processing

Finally, as regards the variable relating to the auditing firms, the analysis carried out is completely different, since it is a qualitative variable which, in order to be used within the regression models, takes on value 1 when the auditing firm is not a Big Four firm or, vice versa, value 0. In the light of the information found, the reprocessing of the data made it possible to identify the following information (See Table 8 here below).

Table 8. Audit Engagements within the Companies Observed - own processing

Auditing firm	2015		2016		2017		2018		2019	
	Q	%	Q	%	Q	%	Q	%	Q	%
Big Four	54	93%	56	93%	61	88%	73	89%	74	82%
Non Big Four	4	7%	4	7%	8	12%	9	11%	16	18%

As can be seen in Table 8, the Big Four have gone from 93% in 2015 to 82% in 2019. Conversely, the other audit firms have grown from 7% in 2015 to 18% in 2019, and the main reason for this may be cost savings.

Come è possibile osservare all'interno della *tabella 11*, le *Big Four* sono passate dal rappresentare il 93% nel 2015, all'82% nel 2019. Viceversa, le altre società di revisione sono cresciute dal 7% del 2015 al 18% del 2019, e la ragione principale di tale fenomeno potrebbe dipendere da un risparmio di costo.

Subsequently, further variables generated from the residuals of the first two regression models will be introduced: unexpected audit fees and discretionary accruals. Once determined, a descriptive analysis will be carried out on these variables as well.

Finally, we propose an approximation¹⁰ (Figure 3 here below) of the representation of the plot "residuals vs fitted", which makes it possible to detect the possible presence of the various cases of violations of the linear regression hypotheses, *i.e.* linearity, homoschedasticity and absence of influential errors/outliers (which largely condition the results obtained).

As can be seen, the red line is not significantly different from the ideal situation (dashed horizontal line, with formula $y = 0$ and the spread of the residuals (cloud of points), despite being particularly concentrated towards the centre-left, extends along the entire line, a sign of the probable presence of homoschedasticity. Finally, the graph shows the presence of three *outliers* (EEMS Italia₂₀₁₅, Enertronica Santerno₂₀₁₅ e Costamp Group₂₀₁₈) that were not considered influential by a subsequent analysis.

With regard to the final validation of this regression model, it is therefore concluded that the presence of linearity, homoschedasticity and the absence of particularly influential residuals have been confirmed¹¹.

¹⁰ The same dataset with *cross-sectional* data was used instead of the *panel* data used so far.

¹¹ Basic requirements for the validation of a regression model.

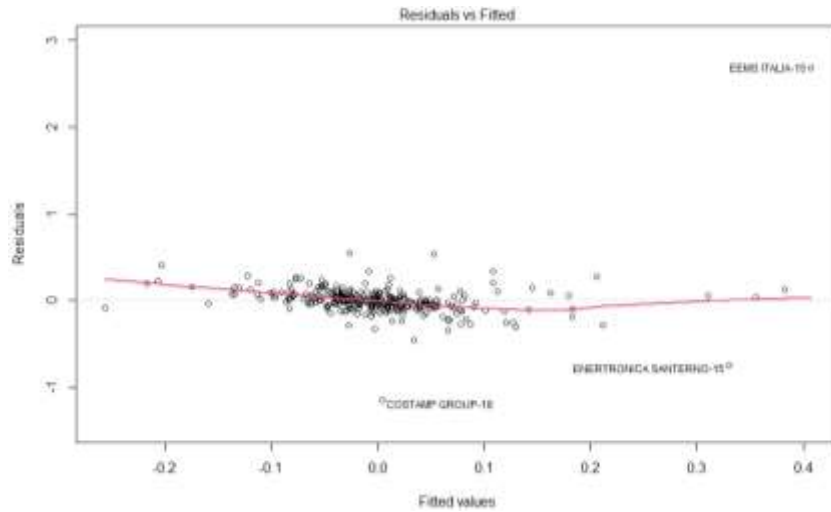


Figure 3. Plot “residuals vs fitted” of Third Regression Model

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