

INTERNAL CONTROL RISK INFLUENCE WHEN PLANNING AN AUDIT: AN EMPIRICAL STUDY OF THE COSO CONCEPTUAL FRAMEWORK

INFLUENCIA DE LOS RIESGOS DE CONTROL INTERNO EN LA PLANIFICACIÓN DE UNA AUDITORÍA: UN ESTUDIO EMPÍRICO DEL MARCO CONEPTUAL DEL INFORME COSO

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SUMMARY

This paper studies whether the audit profession understands and follows the internal control framework developed in the COSO Report about the assessment of control risks. That is to say, the extent to which auditors assess control risks and transmit such assessments on substantive testing work when planning an audit, and take into account the assumptions of COSO which affect the identification of risks, in line with the new audit approach based on business risks. The results of the statistical tests show that, in general, the participants evaluated control risks and adjusted the quantity and extent of substantive procedures in accordance with the threats of internal control when they were presented by following the conceptual framework of the COSO Report.

KEY WORDS: Audit, Audit Risk, Internal Control, Risk Assesment, Audit Planning, Coso Report.

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RESUMEN

Este trabajo pretende analizar si la profesión de auditoría comprende y sigue el marco conceptual del control interno desarrollado por el Informe COSO en la evaluación de los riesgos de control. Es decir, en qué medida los auditores valoran los riesgos de control y trasladan tales valoraciones sobre el trabajo sustantivo durante la etapa de planificación de una auditoría, teniendo en cuenta las premisas de COSO que inciden en una adecuada identificación de los riesgos, en la línea del nuevo enfoque de auditoría orientado hacia los riesgos de negocio. Los resultados de las pruebas estadísticas muestran que en general se tiende a estimar el riesgo de control y a ajustar la cantidad y extensión de los procedimientos sustantivos considerando las amenazas de control interno, cuando se presentan siguiendo el esquema del marco conceptual del Informe COSO.

PALABRAS CLAVE: Auditoría, Riesgo de Auditoría, Control Interno, Evaluación del Riesgo, Planificación de la Auditoría, Informe Coso.

1 INTRODUCTION

After the crisis of the dairy Italian group once again recently hit auditors' credibility, which had already been affected by the accounting scandals in the United States of 2002, different accounting regulatory organizations, IFAC or AICPA, have again shown the importance of internal control systems as measures to prevent financial fraud and to improve financial reporting quality. When it came to reformulating and emphasizing their assumptions related to internal control, these organizations had taken the COSO Report Framework of 1992 as a reference. This document highlights the importance of identifying and managing risks of an entity to establish control policies and procedures in order to minimize the negative impact of these risks.

Likewise as we will see later on, the auditing profession has embraced a business risk-oriented approach in the past few years, which dominates a comprehensive internal control evaluation in order to minimize business risk effects. The most relevant contributions that we have analyzed, and which we refer to in this work, have been addressed to prove that auditors carry out an increasingly in-depth evaluation of the internal control systems through a risk management approach which, in many cases, leads to a reduction of substantive testing.

Nevertheless, none of these studies has been carried out within our borders, as most are by authors from Anglo-Saxon countries. Besides, they do not directly contemplate the impact of risks in audit work when the internal control analysis is performed under the propositions of the COSO Report.

Therefore, in this paper we have examined how the auditing profession in our country transfers the effect of control threats to the control risk assessments, the extent and the nature of the substantive procedures, on the assumption that these threats are included in a company's report on internal control which has been prepared in agreement with the premises of COSO. Although the Spanish audit regulation does not contemplate the new internal control COSO framework, unlike the AICPA and the IFAC standards, we believe this new framework has spread widely and has been followed by the auditing profession in our country given the presence of the international accounting firms in the Spanish auditing market.

We also believe that this paper is a contribution to the international field of research in techniques and auditing procedures, thereby helping to fill the need that, in this respect, is being established in order to increase this type of publications, which in the opinion of Humphrey and Khalifa (2004) are insufficient.

As we detail in the conclusions, the results of this study show that when the profession comes to assessing the control risks and to choosing the nature and extent of audit procedures, it usually considers the premises of the COSO Report Framework.

The rest of the paper is arranged as follows: in the next section of theoretical background we emphasize the importance of internal control in a modern approach to auditing, while we refer to the most relevant publications on it, and we finish with the presentation of the main research questions; then we deal with the research methodology, the considered hypotheses and the statistical treatment, as well as the sample and administration of the experiment. In the last sections we summarize the main findings and conclusions reached.

2 THEORETICAL BACKGROUND

The financial scandals that have recently occurred in the USA (WorldCom or Enron) and in the EU (Parmalat, Ahold or Gescartera) have seriously impaired the credibility of auditing as a guarantor of reliability of financial reporting. The uncertainty raised by these crises was answered by launching various initiatives in order to improve the quality of financial reporting, restore the confidence in the markets and protect shareholders (Rubio and Martínez, 2006).

In this sense, in 2002 the US Congress passed a set of laws contained in the Sarbanes-Oxley Act (SOA), which served as the basis for the creation of a supervisory board for the control of the auditing profession: the Public Company Accounting Oversight Board (PCAOB). One of the matters covered in this law is the obligation of the companies' management listed in the US to issue a report on the effectiveness of the internal controls established in order to ensure the reliability of financial reporting which, in turn, should be submitted to review by an independent auditor.

Another answer lies in the modification of the contents of auditing standards that both the AICPA (American Institution of Certified Public Accountants) and IFAC (International Federation of Accountants) have recently made after the agreement signed in 2000 for the purpose of reviewing regulations on auditing, particularly those related to the risk model, with the aim of homogenizing its contents and amending them to the new working methodologies developed and promoted by large accounting firms¹. As a result of this process, these organizations have issued a set of standards that represent the adoption of the new audit business risk-oriented approach, where the study of internal control plays a major role (SAS 104 to 111 of the AICPA, and ISA 200, 315, 330 and 500 of the IFAC). Arens and Elder (2006) state that with these changes, the new approach of the risk model has been endorsed that has been following the profession since 1990, and which increases the scope of an audit and requires sufficient understanding of the company and its environment, including its internal controls.

(1) In the explanatory memorandum to these texts both organizations recognize that although the initial project of joint collaboration did not begin as a result of the financial scandals, the purpose of the project to improve the audit process has been influenced by them.

However, in order to review and evaluate internal control, auditors need to take into account a conceptual framework as a reference, that is, a standard and accepted interpretation of internal control with the aim of providing its definition, objectives and elements, as well as the relationships between its elements. The internal control framework that the IFAC, the AICPA and the PCAOB have decided to follow is reflected in the report called the COSO (Committee of Sponsoring Organizations²) of 1992.

The COSO publication changed the way of understanding internal control and has emphasized its importance, particularly in achieving the goals of an entity and encouraging the entities to redirect attention to their internal control systems in order to ensure reliability in the process of financial reporting. In addition, it introduced a definition of internal control that makes the evaluation of control systems possible, as well as improving their performance (English, Schooley and Allen, 2004). This report defines internal controls as a process, effected by an entity's board of directors, management and other personnel, designed to provide reasonable assurance regarding the achievement of objectives in the following categories: effectiveness and efficiency of operations, reliability of financial reporting and compliance with applicable laws and regulations. It also identifies five interrelated components within the internal control system: control environment, risk assessment, control activities, information and communication, and monitoring.

On the other hand, the academic contributions that have dealt with the aspects covered by the audit risk model have been numerous since AICPA adopted it in the early 80's, with the publication of SAS 47³. With regard to internal control and audit strategy, the study of Waller (1993) stands out, which conducted the review of working papers from actual audits, drawn from the KPMG Peat Marwick files. In this study, the author concluded that in most engagements, auditors do not rely on internal controls, and the assessment of both inherent and control risks were made at their maximum levels. Therefore auditors did not tend to use compliance testing to reduce substantive work.

Other researchers have obtained analogous results when they noted that, until the early 90's, the auditing profession generally performed audit engagements following the substantive approach methodology. That is, in most situations auditors were inclined to assess the control risk at maximum levels for reasons of efficiency, and then the compliance testing was reduced to a minimum (Mock and Wright, 1993; O'Keefe, Simunic and Stein, 1994).

In recent years however, there has been a shift in the sense that control risk is assessed below its maximum level and auditors tend to rely more on internal controls. In other words, there is a clear tendency toward the perspective of the audit methodology being based on business risks. After collecting information from actual audit engagements of two

(2) Dependent on the National Commission of Fraudulent Financial Reporting, better known as the Treadway Commission.

(3) Audit Risk and Materiality in Conducting and Auditing (1983).

international firms and one local firm for two periods (the former for the years 1993 and 1994, the latter for 1999 and 2000), Elder and Allen (2003) observed an increase of internal control assessments and a rise in compliance testing in the latter period compared with the former one as a result of the incidence of the risk-based approach to business.

In recent years, other authors have also noted that many auditors have expanded the scope of audit approach to explicitly include the strategy and business processes, which emphasizes the assessment of controls as one of its main components, as well as the reduction of substantive testing (Bell et al., 1997; Mock and Wright, 1999; Eilifsen, Knechel and Wallage, 2001; Spira and Page, 2003; Blokdijsk, 2004; Bierstaker and Wright 2004; O'Donnell, Bierstaker and Schultz, 2005; Hsueh, Shaio and Kuang-Hsun, 2006; Allen, Hermanson and Kozloski, 2006). According to this approach, the effort made by auditors depends largely on the identification of internal control threats. Additionally, auditors following this method tend to give more importance to high-risk areas of a company, and adjust the audit resources to address identified risks (Lindow and Race, 2002).

Although these studies generally show that, nowadays, auditors follow the business risk model, none has demonstrated the application of the new internal control conceptual framework presented in the COSO Report in connection with control risk assessments and its effect on the choice and scope of audit procedures, as reflected by the AICPA (2006) and IFAC (2006). Therefore, we have formulated the following central research question:

Does the audit profession consider internal control threats in the planning of substantive procedures when they are presented in accordance with the conceptual framework of the COSO Report?

In order to answer this question, we have formulated a set of hypotheses in its alternative form which have been introduced and explained after referring to the research methodology for a better understanding.

In agreement with what we have just outlined, an affirmative response would be expected:

- In the studies we have just described, in which the risk model and internal controls have been analyzed, the results show a positive relationship between control threats and substantive audit procedures.
- Recent changes in audit regulations have highlighted the importance of assessing internal controls in an audit, and have taken the guidelines contained in the COSO Report as a reference.

3 RESEARCH METHODOLOGY

To review the auditors' response to different internal control risk scenarios, the methodology based on the experimental design has been used. According to Peecher and Solomon (2001), experimentation allows to penetrate as far as possible in the explanatory stage of scientific knowledge. Our research is confined within the studies related to audit judgments and decision-making processes, which are aimed to learn about the decision-making process in planning, developing and finishing an audit engagement.

The study has three dependent variables and one independent variable. The first of the dependent variables is the risk assessment of internal controls. The data collection for this variable has been conducted by asking the participants to assess the control risk at the assertion level for different accounts from the sales cycle (**Table 1**). Therefore, the risk assessments in the experimental design were made at the highest level of disaggregation of the financial statements, account assertions, in order to ascertain whether the incidence of control threats applies only to the assertions of the accounts involved or to the majority. Normative texts of auditing, such as those in either the IFAC (2006) or in AICPA (2006) and, to a certain extent, those in the NTA (Normas Técnicas de Auditoría), specify that such assessments should be conducted at this maximum level of disaggregation.

TABLE 1.- DEPENDENT VARIABLE: ASSERTIONS

Account	Assertions (dependent variable)
Sales	Completeness Existence Presentation and disclosure Valuation
Accounts receivable	Completeness Existence Presentation and disclosure Rights and obligations Valuation
Allowance for bad debts	Completeness Existence Presentation and disclosure Valuation
Warranty liabilities	Completeness Existence Presentation and disclosure Valuation

The second of the dependent variables contemplated is the election of substantive audit procedures. To this end, the participants were given a set of 55 possible substantive procedures of the sales cycle, and they had to indicate whether each of the suggested procedures would be chosen. If the participants responded positively, they also had to indicate the estimated time that the execution could take, which constitutes the valuation of the third dependent variable. It is expected that a weakness in the controls should result in an increase in testing, but only over the specific assertion affected by the threat which is associated with that weakness.

On the other hand, the only independent variable considered is the presence of threats in the internal control system. The control structure included in the material prepared, which was delivered to participants, has been elaborated by taking into account the new internal control business risks-oriented framework (COSO, 1992; IFAC, 2006; AICPA, 2006). Thus, the components that arise from the internal control system that have been described in the cases prepared, and into which certain control threats were deliberately introduced, match the COSO components: control environment, risk assessment, control activities, information and communication and monitoring.

The independent variable has been implemented on two different levels, that is to say, two different threats were introduced into the sales cycle of a hypothetical company: the lack of sound control procedures (a) in the valuation of warranty liabilities and (b) in the valuation of sales and accounts receivable. The manipulation of the independent variables has been specified between subjects; in other words, each participant received a single treatment; only one case study with independent variables suitably manipulated, representing the treatment, was given to the participants.

What the selected control threats have in common is that they obey non routine operations, that is, they are estimations and accounting aspects related to valuation. According to Gay (2002), the audit approach which focused on business risks attaches greater importance to such operations because it is more likely that they could cause an error in the financial statements.

We prepared three case studies which were distributed randomly among the participants. A case that contained no internal control threats within the sales cycle, except for the assertion of valuation of warranty liabilities, was given to the first group. A second group received a case where the threat in the internal control of the sales cycle was within the valuation assertion of sales and accounts receivable, while the rest of controls operated satisfactorily. In a third group, the control one, all the elements of the internal control system of the sales cycle in the case were working correctly, that is, no relevant threat control. As noted above, the subjects with their answers were assessing the dependent variables of the study: internal control risks, and the nature and extent of audit procedures.

4 HYPOTHESES AND DATA ANALYSIS

The statistical design is a between-subjects analysis of variance (ANOVA) of one factor. The factor between subjects is represented by the threats of the internal control system, that is, the participants belonging to one of the three groups. Therefore, the treatment groups and the control group are formed by different subjects.

The hypotheses have been formulated to test the auditors' response to control threats, by taking into account that the control information provided to the participants in the case studies was presented by having following the conceptual framework of the COSO Report. It has also been assumed the relationships expected between the variables are in accordance with the audit regulations of both the IFAC (2006), AICPA (2006), and of the NTA to some extent⁴. The hypotheses have been formulated in alternative form because their acceptance was expected.

H1: The profile of mean control risk (CR) assessments for the three groups, excluding the CR assessment of the valuation assertion for warranty liabilities, sales and accounts receivable, should be coincident.

H1.1: The mean of CR assessments of the subjects of Group 1 should be significantly higher than those of the subjects of Group 3 for the valuation assertion for warranty liabilities.

H1.2: The mean of CR assessments of the subjects of Group 2 should be significantly higher than those of the subjects of Group 3 for the valuation assertion for sales and accounts receivable.

H1.3: The mean of CR assessments of the subjects of Group 1 should be significantly higher than those of the subjects of Group 2 for the valuation assertion for warranty liabilities.

H1.4: The mean of CR assessments of the subjects of Group 2 should be significantly higher than those of the subjects of Group 1 for the valuation assertion for sales and accounts receivable.

With this first set of hypotheses, it has been tested whether the risk assessments of internal control coincide in all three groups for all the assertions, except those related to the threats existing in the internal control structure (H1); furthermore that the CR assessment is higher in the group into which the threat has been introduced for the valuation assertion involved (H1.1 to H1.4).

⁽⁴⁾ Although the NTA contains implicit references to the risk model, they are closer to the AICPA approach of the 80's than to the current framework based on business risks. However, the relationships studied in this paper would also be included in the NTA to some extent.

H2: The profile number of planned audit hours for the three groups, excluding the audit hours planned for testing the valuation assertion for warranty liabilities, sales and accounts receivable, should be coincident.

H2.1: The number of planned audit hours of the subjects of Group 1 should be significantly higher than that of the subjects of Group 3, for the audit procedures testing the valuation assertion for warranty liabilities.

H2.2: The number of planned audit hours of the subjects of Group 2 should be significantly higher than that of the subjects of Group 3, for audit procedures testing the valuation assertion for sales and accounts receivable.

H2.3: The number of planned audit hours of the subjects of Group 1 should be significantly higher than that of the subjects of Group 2, for audit procedures testing the valuation assertion for warranty liabilities.

H2.4: The number of planned audit hours of the subjects of Group 2 should be significantly higher than that of the subjects of Group 1, for audit procedures testing the valuation assertion for sales and accounts receivable.

H2.5: The total amount of planned audit hours of the sales cycle of Groups 1 and 2 should be significantly higher than that of the subjects of Group 3.

The second set of hypotheses has allowed to test whether the number of planned audit hours is coincident in the three groups for all procedures, except those relating to threats (H2), and also whether the extent of the procedures associated with control threats is higher in the group into which the threat has been introduced (H2.1 to H2.4). Finally, to test whether the total hours planned for all the procedures is greater in the groups with control threats (H2.5).

H3: The profile of audit procedures chosen for the three groups, excluding the audit procedures testing the valuation assertion for warranty liabilities, sales and accounts receivable, should be coincident.

H3.1: The audit procedures chosen for the subjects of Group 1 should be significantly higher than those for the subjects of Group 3, for the audit procedures testing the valuation assertion for warranty liabilities.

H3.2: The audit procedures chosen for the subjects of Group 2 should be significantly higher than those for the subjects of Group 3, for the audit procedures testing the valuation assertion for sales and accounts receivable.

H3.3: The audit procedures chosen for the subjects of Group 1 should be significantly higher than those for the subjects of Group 2, for the audit procedures testing the valuation assertion for warranty liabilities.

H3.4: The audit procedures chosen for the subjects of Group 2 should be significantly higher than those for the subjects of Group 1, for the audit procedures testing the valuation assertion for sales and accounts receivable.

With this last set of hypotheses we verify that the election of procedures is coincident in all three groups, except for those related to threats (H3), and that with an internal control threat, auditors perform audit procedures which test the impact of this threat on the account assertion involved (H3.1 to H3.4).

The dependent variables that have been incorporated into the experimental design can be divided into two groups: (1) those that should not be influenced by threats of the internal control structure in the experimental case, which have been contrasted with Hypotheses H1, H2 and H3, and (2) those that should be influenced by one of the threats of the internal control structure in the experimental case, which have been contrasted with the rest of hypotheses.

The investigation method applied to the first group of variables is a profile analysis and a multivariate analysis of variance⁵ (MANOVA). These methods allow to clarify whether or not the groups differ in risk assessments, in the election of procedures and in the time budgeted. Profiles are expected to be either coincidental or very similar for all three groups for all the dependent variables considered. The MANOVA test results should also show no significant differences for all the dependent variables of the three groups. These aforementioned analyses were followed for Hypotheses H1, H2 and H3.

On the other hand for the other set of variables, since an influence of internal control threats was expected, the answers of the three groups of subjects should differ. To ensure this, the remaining contrast of the hypotheses was done through planned comparisons, from the analysis of variance (ANOVA). Stevens (2001) states that planned comparisons have a greater statistical power than other statistical comparisons, such as post hoc, particularly when sample sizes are not too large. Each set of planned comparisons is related to one of the dependent variables: control risk assessment, the time budgeted and the election of substantive audit procedures.

5 | SAMPLE SELECTION AND CASE DEVELOPMENT

The work involved in the experiment requires practicing with the audit planning process; therefore, it addresses experienced auditors, with a professional judgment in auditing. Bonner

(5) It has been done with the MANOVA tables of the SPSS program, which include four statistics: Pillai's Trace, Wilk's Lambda, Hotelling's Trace and Roy's Largest Root.

and Lewis (1990) found that auditors who have more experience and better training perform certain complex audit tasks better because they have a greater knowledge of their work. Frederick (1991) and Abdolmohammadi and Usoff (2001) also came to similar conclusions.

On the other hand, the geographical area of the experimental design is limited to auditors who exercise their profession in offices of the Valencian Community (Spain). Most analogous works have chosen similar geographical limits, for example, Eilifsen (2001); Lloyd and Goldschmidt (2003); Bierstaker and Wright (2004) and Dikolli, McCracken and Walawski (2004). We believe that although the results cannot be generalized in the national context, they represent a sample of audit practices within Spain for the studied issues related to the risk model and to internal control.

We sent a letter of presentation addressing the partner to all the audit offices of the Valencian Community, approximately 110, by mail. The letter suggested distributing the enclosed letters among staff with at least three year's auditing experience. The enclosed letters contained a request to cooperate in the project. The approximate total number of requests made available to auditors was 450.

When the auditors expressed their wish to take part in the study, it was necessary to go to an Internet site⁶ where the case study of the experiment is found. At this site, they had to complete the questionnaires on the sales cycle of a hypothetical medium-sized client belonging to a distribution company of peripherals components for computers. Each case study contained a brief description of the business and information from previous audits; unaudited current balance and profit and loss account; an overview of the risk analysis and the internal control system; an incomplete risk report for sales cycle with assessments on inherent risk assertions, and a list of possible substantive audit procedures for the cycle.

All the subjects were asked to complete the risk report for the sales cycle by assessing the risk control of each account assertion (H1 and H1.1 to H1.4), and to also choose the audit procedures (H3 and H3.1 to H3.4). Finally, they were requested to indicate the time expected for them (H2 and H2.1 to H2.5). Responses were automatically sent to a researcher's e-mail address.

The number of letters was established to achieve a final sample size of responses between fifteen and twenty per group, a sufficient number to identify the presence of significant differences among groups. Finally, the number of auditors who answered and e-mailed back our collaboration request came to 39. Although the number of responses to each variation of the instrument is relatively low, when compared with samples obtained in analogous studies [Lloyd and Goldschmidt (2003) and Peters (1989)], the amount is reasonable and suitable for a project of this nature.

(6) In fact each letter contained only one Internet address of the three that existed, in order to forward the participant just to one of the three case studies. The inclusion of one of the three addresses on the letters was made randomly.

6 RESULTS

6.1. Demographic analysis of the sample

We obtained 39 replies which were sent to our e-mail address. The sample is distributed as follows: 15 for Group 1, 14 Group 2 and 10 for Group 3.

According to the demographic analysis of the responses obtained, the average in terms of experience in auditing was over ten years. Most were from one of the Big Four accounting firms, which is 80%. We only received eight answers from other types of auditors.

Table 2 shows a summary of the responses of all three groups. With regard to the auditors' position, 100% had the category of senior, supervisor, manager or partner. Therefore, the sample covers a very broad section of the positions that auditors may hold. The number of years work's experience as an auditor of the participants was between 4 and 25, with an average experience of more than 10 years. Furthermore, the average number of audits that had involved planning an audit engagement was 27. Therefore, the demographic characteristics in terms of experience of all the participants were suitable for completing the questionnaires included in the case studies.

TABLE 2.- DEMOGRAPHIC INFORMATION

	Group 1	Group 2	Group 3	All groups
Participants' number	15	14	10	39
Position in the company:				
Partner	4	2	-	6
Manager	4	3	4	11
Supervisor	7	1	3	11
Senior	-	8	3	11
Years of experience	12.60	10.50	8	10.37
Quality of information presented	7.47	6.86	6.60	6.98
Time needed for the task	31.33	34.29	29.80	31.81
Accounting company:				
International	13	10	8	31
Local	2	4	2	8

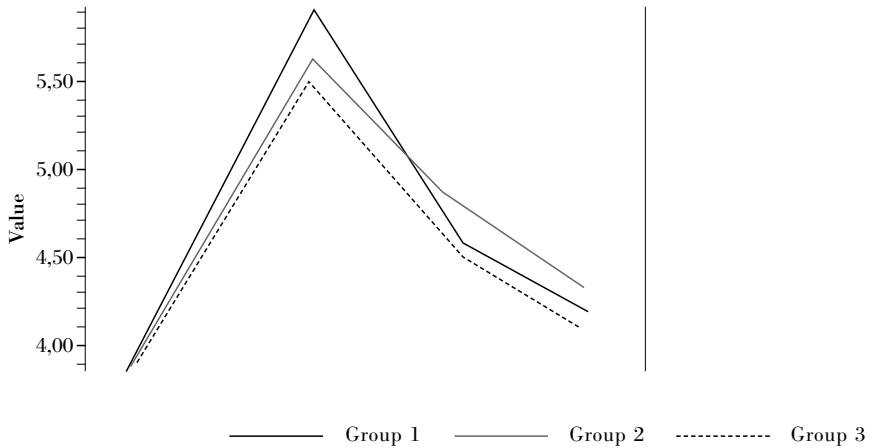
On the other hand, the average time it took the participants to accomplish the required task was around 30 minutes. In the demographic questionnaire, the subjects were also requested to evaluate the adequacy of the information contained in the case study on a

scale of 1 to 10. The average number of responses to this question was 6.98, indicating that in most cases the information was suitable for the subjects.

6.2. Risk assessment of internal control

The participants were requested to assess the internal control risk for each account assertion contained in the case study, which represents the first set of dependent variables, see **Figure 1**.

FIGURE 1.- CONTROL RISK PROFILE: ACCOUNT LEVEL



The MANOVA test and profile analysis have been done on the assessment of control risk assertions, which should not be influenced by the control threats introduced, that is to say, all the assertions except that of valuation, Hypothesis H1. The MANOVA test results in **Table 3** show that the level of significance of the four statistics is not under 0.05. Therefore there are no significant differences between the 3 groups studied because of the effect of the independent variables. The data variables at the account level have also been graphically represented in order to verify that there are no important differences among the three groups (**Figure 1**). Indeed we observe that the profile of the three lines practically matches, as expected. Therefore, the participants valued the risk control similarly for the account assertions that were not related to threats.

In contrast, planned comparisons have been used to test whether control threats have an effect on the assertions involved (Hypotheses H1.1 to H1.4). These comparisons have been carried out only on the dependent variables, which should be influenced by the

independent variables, that is, those that have not been taken into account in the previous analysis. **Table 4** illustrates a summary of the results of these tests. Provided that the level of significance is under 0.05 for all the contrasts, they all are significant and there are differences between the compared groups. Control threats influence the risk assessment of the assertions of the related accounts.

In short, with these results, we are able to accept Hypotheses H1 and H1.1 to H1.4. That is, the auditors assess the control risk in accordance with control threats.

TABLE 3.- MULTIVARIATE TEST TABLE. CONTROL RISK ASSESMENT

Effect		Value	F	Hypothesis df	Error df	Significance
Group	Pillai's Trace	.248	1.202	8.000	68.000	.311
	Wilks Lambda	.763	1.193	8.000	66.000	.317
	Hotelling's Trace	.296	1.182	8.000	64.000	.324
	Roy's Largest Root	.233	1.983	4.000	34.000	.119

TABLE 4.- PLANNED COMPARISONS FOR CR ASSESSMENTS

Contrast	Comparison	Value of contrast	Standard error	t	df	Sig. (2-tailed)
Contrast 1 (i)	Group 1 - Group 3 (Warranty liabilities)	3.27	.401	8.143	36	0.001
Contrast 2 (i)	Group 1 - Group 2 (Warranty liabilities)	3.90	.365	10.667	36	0.001
Contrast 3 (ii)	Group 2 - Group 3 (Accounts receivable)	3.76	.361	10.399	10.411	0.000
Contrast 4 (ii)	Group 2 - Group 1 (Accounts receivable)	4.59	.384	11.965	15.900	0.000
Contrast 5 (ii)	Group 2 - Group 3 (Sales)	4.10	.233	17.571	9.000	0.000
Contrast 6 (ii)	Group 2 - Group 1 (Sales)	4.87	.307	15.876	14.000	0.001

NOTE: Each contrast compares the internal control risk for the valuation assertion of the account.

(i) Contrast assuming equal variances.

(ii) Contrast not assuming equal variances.

6.3. Extent of planned audit procedures

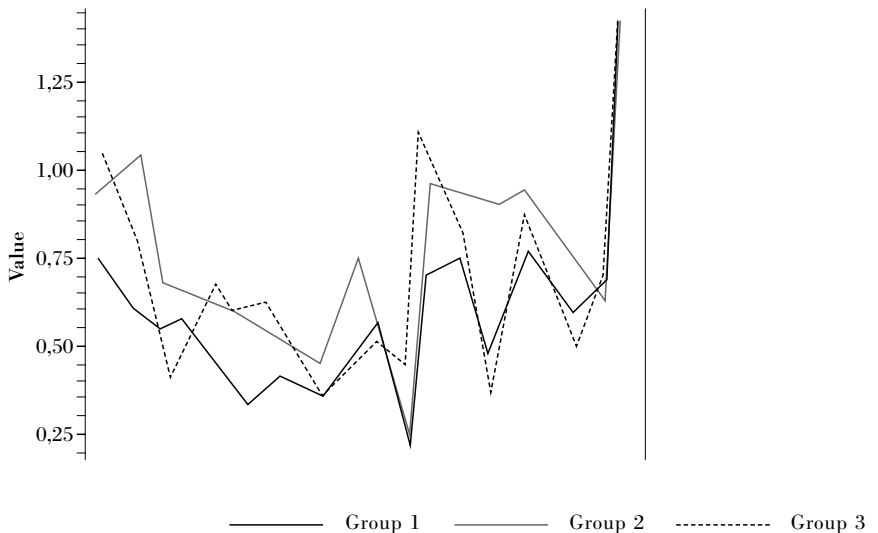
The extent of the planned audit procedures corresponds to the second set of dependent variables studied. With a set of substantive procedures from the area of sales and accounts receivable, the participants were asked to indicate the time they would considered appropriate to conduct them.

Table 5 shows the results of the MANOVA statistical analysis for H2. Only those procedures that should not be related to threats have been taken. At least the level of significance is over 0.05 for one of the statistics, Hotelling’s trace, while it is close to this reference value for the others. Therefore according to these results, the initial hypothesis would be partially backed. **Figure 2** graphically represents the profile analysis for dependent variables at the level of individual audit procedures to determine whether the performance of the three groups is basically identical. The fact that the lines almost overlap is distinguished in this figure.

TABLE 5.- MULTIVARIATE TEST TABLE. TIME BUDGETED

Effect		Value	F	Hypothesis df	Error df	Significance
Group	Pillai’s Trace	1.150	1.832	32.000	44.000	.311
	Wilks Lambda	.179	1.792	32.000	42.000	.317
	Hotelling’s Trace	2.755	1.722	32.000	40.000	.324
	Roy’s Largest Root	1.614	2.219	16.000	22.000	.042

FIGURE 2.- TIME BUDGETED PROFILE: PROCEDURE LEVEL



To summarize, the results partially sustain the initial Hypothesis H2. According to the MANOVA analysis, only one of the statistics supports this hypothesis, although the time profile of the procedures of all three groups follows a very similar trend. Therefore, in general, the auditors' response on the extent of procedures not testing control threats does not depend on the fact that they are present.

On the other hand, compliance with hypothesis H2.1 to H2.5 has been verified with planned comparisons, that is, whether the time budgeted for substantive procedures testing threats is influenced by them. Comparisons were made only on the variables that measure the time budgeted and that should be influenced by internal control threats; see **Table 6**.

TABLE 6.- PLANNED COMPARISONS FOR TIME BUDGETED

Contrast	Comparison	Value of contrast	Standard error	t	df	Sig. (2-tailed)
Contrast 1 (ii)	Group 1 - Group 3 (Warranty liabilities)	9.18	1.389	6.61	22.23	0.001
Contrast 2 (ii)	Group 1 - Group 2 (Warranty liabilities)	10.00	1.309	7.64	20.95	0.000
Contrast 3 (i)	Group 2 - Group 3 (Acc. receiv. / Sales)	35.89	3.73	9.61	36	0.001
Contrast 4 (i)	Group 2 - Group 1 (Acc. receiv. / Sales)	41.37	3.35	12.35	36	0.000
Contrast 5 (i)	Group 1 - Group 3 (All procedures)	2.15	5.12	.42	36	0.677
Contrast 6 (i)	Group 2 - Group 3 (All procedures)	36.06	5.19	6.95	36	0.000

NOTE: Each contrast compares the time budgeted for those procedures that are designed to prove the internal control threats introduced.

(i) Contrast assuming equal variances.

(ii) Contrast not assuming equal variances.

The level of significance is under 0.05 for the first four contrasts, thus supporting the initial hypotheses. In other words, there are differences between the groups compared, and the auditor budgets a larger extent of procedures that test control threats directly. Instead, the level of significance of one of the last two contrasts is above 0.05, so when the extent of all the planned audit procedures is considered, the total amount of time does not significantly vary in the group on which the warranty expenses threat has any effect in relation to the control group, this being Contrast 5. Briefly, audit efforts tend to be usually conducted by pondering control threats. Therefore, we accept Hypotheses H2.1 to H2.4, and H2.5 is partially accepted.

6.4. Number of planned audit procedures

The third set of dependent variables analyzed corresponds to the election of planned audit procedures. For this purpose, the participants had to indicate whether or not they would choose the substantive procedures for the sales and accounts receivable area from a list provided.

The MANOVA analysis for H3 has been done on the procedures which should not be influenced by control threats, see **Table 7**. Pillai's Trace statistic, which in fact is one of the most robust, shows that the significance values are quite high, so that there would be no significant differences among the three groups. However, the statistical Roy's Largest Root reflects a level of significance below 0.05, indicating that there would be significant differences among the three groups. Therefore, we cannot absolutely affirm that the auditors of the three groups have statistically answered in a similar way.

TABLE 7.- MULTIVARIATE CONTRASTS. PROCEDURE CHOICE

Effect		Value	F	Hypothesis df	Error df	Significance
Group	Pillai's Trace	.202	2.021	4.000	72.000	.101
	Wilks Lambda	.799	2.083	4.000	70.000	.092
	Hotelling's Trace	.252	2.139	4.000	68.000	.085
	Roy's Largest Root	.249	4.489	2.000	36.000	.018

To further verify the behavior of the groups, in **Figure 3** we represent data from the dependent variables in terms of election of procedures, that is, the profile analysis. According to the figure, the responses of the three groups, which are represented by lines, show an analogous course, that is, there are no significant variations in the trend on the charts for the values of the dependent variables which are not related to internal control threats. Therefore, the results partially show that the choice of procedures, which does not test control threats directly, is not influenced by them being present.

On the other hand, planned comparisons helped us to see whether the choice of substantive procedures has taken into account control threats, Hypotheses H3.1 to H3.4. A summary of these test results is shown in **Table 8**. As the level of significance is under 0.05, the initial hypotheses are accepted and, therefore, the differences between compared groups were significant. Consequently, the statistical analysis of data supports the initial hypothesis: a control threat makes the auditors select a larger number of specific procedures to test the threat.

FIGURE 3.- PROCEDURE CHOICE PROFILE: PROCEDURE LEVEL

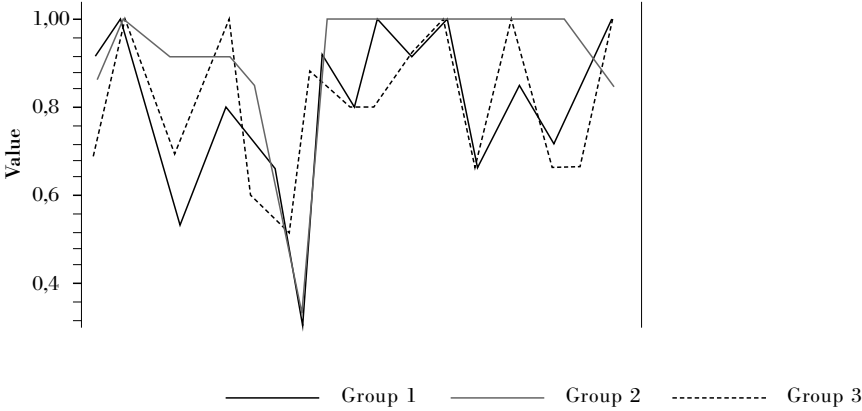


TABLE 8.- PLANNED COMPARISONS. PROCEDURE CHOICE

Contrast	Comparison	Value of contrast	Standard error	t	df	Sig. (2-tailed)
Contrast 1 (i)	Group 1 - Group 3 (Warranty liabilities)	0.24	0.05	4.50	36	.001
Contrast 2 (i)	Group 1 - Group 2 (Warranty liabilities)	0.30	0.05	6.11	36	.000
Contrast 3 (ii)	Group 2 - Group 3 (Acc. receiv. / Sales)	0.29	0.03	9.27	10.470	.001
Contrast 4 (ii)	Group 2 - Group 1 (Acc. receiv. / Sales)	0.30	0.02	12.45	17.855	.000

NOTE: Each contrast compares the percentage of the selected procedures that are designed to prove the IC threats introduced.

(i) Contrast assuming equal variances.

(ii) Contrast not assuming equal variances.

7 CONCLUSIONS

The audit approach based on business risks is an extension of the traditional model of risk, which places greater emphasis on understanding the client’s business and the facing of risks (Gay, 2002). Our study has found that auditors tend to adjust the audit effort on the basis of internal control threats, which indicates the business risk-oriented audit model would be followed. For this purpose, the effect of various control problems in the risks assessments has been measured, not only in the choice of substantive procedures, but also in the time budgeted for the procedures.

In this respect, most of MANOVA tests and profile analysis used to corroborate Hypotheses H1, H2 and H3 have revealed that internal control threats neither affect the control risk assessment of the account assertions nor the choice and scope of the audit procedures, provided that are not related to these threats. However, the contrasts of planned comparisons followed to verify the remaining hypotheses (H1.1 to H1.4, H2.1 to H2.5 and H3.1 to H3.4), generally show that threats lead to an increased control risk assessment of the account assertions and to a greater extent and amount of audit procedures when they are related to these threats.

In addition, the information, about the internal control of the hypothetical company that has been used to create the case studies provided to the auditors involved in the study, has been submitted and has followed the COSO Report conceptual framework. Therefore in the light of the aforementioned results, we also conclude that the audit profession understands the contents of this report and adjusts the focus of its work in accordance with control threats when they appear following COSO methodology.

In short, the auditors have answered by considered the new orientation of the audit risk model, which attaches great importance to the identification and management of business risk, despite the fact that its contents have not yet been introduced into our auditing standards. We understand that the presence of international accounting firms in our country has contributed significantly to the knowledge and dissemination of this new approach among auditors, according to the obtained results. Thus, in general, auditors adjust the control risk assessment, as well as the election and extent of planned audit procedures taking into account internal control threats when such threats were shown in accordance with the COSO conceptual framework.

Therefore, it would be desirable to update the Spanish NTA with regard to the audit risk model in order to incorporate the new prevailing business risk-oriented approach and, in particular, the new internal control conception, as important audit regulatory organizations have already done.

The risk model of the AICPA in the 80's was the first conceptual framework that should be considered by the auditing profession to perform its work efficiently and effectively. At present, the conceptual framework is developed in the new approaches in standards linked to audit risk, and which are included in both the SAS (AICPA, 2006) and ISA (IFAC, 2006). Based on the model of the 80's, a new approach has been defined which is more in tune with today's economic realities and in response to the recent financial scandals.

The new Eighth Directive (2006/43/EC) on the statutory audit, which states that all statutory audits conducted in the European Union will be performed in accordance with the ISA issued by IAASB of IFAC, is the first step in our country to resolve this regulatory

gap. Thus, when the Commission finally adopts the ISA, then the need to update the NTA will be amended. In our opinion, the quality of audits would improve with the inclusion of this business risk-based philosophy into the established standards of Spain.

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