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How are accounting irregularities examined in Spanish insolvency proceedings? An empirical analysis

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ABSTRACT

In this paper we have conducted an empirical analysis of the relevant accounting irregularities assessed in Spanish bankruptcy proceedings. Based on a sample of 121 judgments in which the Mercantile Courts and the Provincial Courts analysed the accounting situation of bankrupt companies, we have obtained evidence that judges and courts take into account both quantitative and qualitative factors of the materiality of the infractions, and that judges specialised in mercantile matters tend to apply stricter levels of materiality than non-specialists. However, neither accounting offences nor the degree of specialisation of the judges seemed to have a significant impact on the sentences imposed. Finally, we did not find that implicitly selected materiality levels in precedent judgments could condition or influence the qualification of accounting irregularities in judicial demarcations.

¿Cómo se enjuician las irregularidades contables en los procedimientos concursales españoles? Un análisis empírico

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RESUMEN

En este trabajo llevamos a cabo un análisis empírico de las *irregularidades contables relevantes*, que son enjuiciadas en el seno de los procedimientos concursales españoles. Con base en una muestra de 121 sentencias en las que los Juzgados de lo Mercantil y las Audiencias Provinciales analizaron la situación contable de las empresas concursadas, hemos obtenido evidencia de que los jueces y tribunales toman en consideración tanto los factores cuantitativos como cualitativos de la materialidad de las infracciones, y de cómo los jueces especializados en materias mercantiles tienden a mostrar unos niveles de materialidad más estrictos que los no especialistas. No obstante, ni las infracciones contables ni el grado de especialización de los jueces parecen tener influencia significativa en las condenas impuestas. Por último, no hemos apreciado que, en las demarcaciones judiciales, los niveles de materialidad implícitamente seleccionados en las sentencias precedentes pudieran condicionar o influir la calificación de las infracciones contables.

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1. Introduction

How do judges understand relevant accounting irregularities? Do they limit to consider their quantitative dimension, or do they also appreciate qualitative aspects? To what extent can the adoption of decisions on such infractions be influenced by certain professional and contextual characteristics of judges and Courts? What are the consequences of incurring in behaviors qualified as infringing? To answer these questions, in this paper we conduct an empirical analysis of what in the Spanish Bankruptcy Law are called *relevant accounting irregularities*, which are judged in bankruptcy proceedings and which, according to Gurrea (2016), is a procedure that has no paragon in the legislations of our environment[1].

For this purpose, we verify whether, as expected, to the extent to which the probability of considering accounting violations as relevant is directly related both to their amount and to their qualitative aspects, whether judges' decisions on such irregularities are conditioned by their level of professional specialization, and whether the severity of the sanctions imposed on companies is related to the materiality of the violation committed. For this purpose, we will use different characterizations of both logit and linear regression models.

In the Spanish insolvency system, judges and Courts evaluate the materiality of the accounting irregularities[2] identified by the insolvency administrators in their review of the company's accounting records, concluding, in each specific case, whether or not the possible non-compliance that has been detected can be considered an accounting irregularity; whether or not, having confirmed that it is an accounting irregularity, it has a sufficient degree of relevance, and whether or not such relevance is significant for understanding the company's financial situation. This singularity could stem from the fact that the Spanish insolvency system, as stated by Sánchez-Vidal et al. (2023) and Wang (2012), is oriented towards the protection of creditors, which would explain the importance given by the legislator to accounting issues[3].

Thus, this assessment of the materiality of accounting irregularities to be deployed by judges and courts of law gives us the unique possibility of knowing how they assess them. It is well documented in the literature how materiality is appreciated by auditors, audit committees, regulators, and users in general[4], but we do not know how accounting infractions are assessed in the judicial arena. Likewise, the literature on the effects and consequences of these irregularities on those responsible for such conduct is still scarce, so our study contributes to the knowledge of these interesting questions. We believe that our study provides useful knowledge for legislators, for professionals operating in the insolvency field -bankruptcy administrators, consultants, attorneys, and judges themselves– and for companies, as it provides both the quantitative and qualitative references of judicial decisions and the real consequences of accounting violations.

In Spain, the examination of accounting irregularities is at present regulated by Royal Legislative Decree 1/2020, of May 5, 2020, which establishes the refunded text of the Spanish Bankruptcy Code. The Spanish legislation on this matter is distinguished, among other things, by its incessant changes, although its legal configuration of accounting irregularities has remained unchanged since the promulgation of Bankruptcy Law 22/2003, of July 9, 2003, which stated that such irregularities must be assessed within a special procedure, known as "qualification", which takes place within the insolvency proceeding, and in which the judge, given the facts and circumstances, and based on the report issued by the insolvency administrators and, if applicable, the creditors and the Public Attorney's Office, will determine whether or not there have been accounting anomalies, and whether or not these are relevant for the understanding of the financial situation of the bankrupt company. A brief description of the procedure will be provided below.

Our research is based on the analysis and review of the sentences compiled by the *Judicial Documentation Center* of the Spanish Ministry of Justice between January 2021 and March 2023 that resolve possible relevant accounting irregularities committed by companies in bankruptcy, thus joining the trend of archival research, which, in the words of Moers (2007), is the methodology that analyzes the content of documents whose primary purpose is not their use in academic research, but whose contents are likely to constitute the primary source of data to apply quantitative methods and draw conclusions from their contents. In the words of Hanlon et al. (2022), this methodology based on archival data constitutes an essential piece for the development of the behavioural aspects of accounting.

The rest of the paper is organized as follows. In the second section we briefly review the literature most relevant to the content of our study; in the third section we present the design of our research, framing it in the Spanish regulatory context, and present our hypotheses; in the fourth section we describe the models we will use for their empirical contrast; In the fifth section we explain the sample construction process and comment on the main descriptive statistics; in the sixth section we show and discuss our main empirical findings, which will be extended and complemented with various tests in the seventh section; and in the eighth and final section, we conclude with some closing remarks.

2. Literature review

Although, as we have advanced, to the best of our knowledge we know of no studies that analyze how accounting irregularities are evaluated in the judicial world, it does seem appropriate, at least briefly, to comment on the empirical contributions closest to our study that we consider most relevant, to characterize the context in which this research is framed[5]. As Bloomfield et al. (2016) argue, this contextualization is important in the field of archival research, as it helps to un-

[1] As Gurrea (2016) points out, there is no procedure like that of the accounting qualification of the insolvency proceedings as the one existing in Spanish law, and, therefore, a regime that could allow the insolvency of a company to be assessed as "fortuitous" or "guilty" based on the gravity of the accounting irregularities. However, this does not mean that, in comparative law, breaches of this nature are not sanctioned during the insolvency proceedings.

[2] An irregularity is material if its omission or misstatement would reasonably influence the economic decisions of users taken based on the financial statements.

[3] For a detailed examination of the Spanish bankruptcy system (analyzing different perspectives of its efficiency), the reader can consult the excellent papers by Detotto et al. (2019), García-Posada & Mora-Sanguinetti (2014), García-Posada & Vegas (2018), Mruk et al. (2019) and Sánchez-Vidal et al. (2023).

[4] See the reviews of this literature conducted by Messier et al. (2012) and DeFond & Zhang (2014), as well as the excellent article by Keune & Johnstone (2014).

[5] For a more in-depth and detailed study on this subject, we refer the reader to the excellent surveys by Amiram et al. (2018) on accounting misconduct, and by Hanlon et al. (2022) on the Behavioral Accounting. Amiram et al. (2018) discusses the causes and consequences of these behaviors and addresses interesting methodological issues, while Hanlon et al. (2022) synthesizes the main issues related to the accounting decision-making process by different actors, including judges.

derstand the relative importance and scope of the evidence provided, especially in those cases where there is no well-established prior theory or where previous empirical contributions are scarce or even nonexistent.

A common characteristic of the contributions we are going to discuss is the fact that they operate with small samples, approximately between 50 and 200 observations, which in this methodological approach is considered a sufficient size to reach robust conclusions. In our opinion, Feroz et al. (1991) is the pioneering work in this line of research. A sample of 85 companies investigated between 1982 and 1989, which received a total of 188 Accounting and Auditing Enforcement Releases (hereafter referred to as AEERs)[6] from the US Securities and Exchange Commission (SEC), concluded that the level of quantitative materiality being the main factor explaining this decline in the value of firms investigated by the SEC. They studied the degree of materiality of the irregularities that gave rise to administrative, civil, or criminal prosecutions, as well as the consequences of those actions on managers, auditors, and the market reaction to the public disclosure of such practices. In 75 of the 85 companies implicated in accounting fraud, the auditors also received sanctions, and the public announcement of fraud was received by investors with negative abnormal returns of 12.9% on the day of the announcement.

Another very notable contribution is that of Beasley (1996), for being the first to link the commission of accounting fraud with the composition of the Board of Directors. Taking a sample of 75 companies accused of fraudulent practices by the SEC between 1980 and 1991, which received an AAER, and carrying out a contrast with another control sample of companies similar in size, sector affiliation and accounting period, he documented how the proportion of independent directors significantly reduced the probability of incurring in such practices, although the existence of the Audit Committee did not contribute to mitigating -in those years- these conducts.

Contemporary to the aforementioned study, and some extent also complementary, is that of Dechow et al. (1996), in which, based on a sample of AAERs of 92 companies between 1982 and 1992, studied the causes and consequences of accounting manipulation oriented to artificially increase earnings. Among their findings, it is interesting to note that these authors identified that such behaviours were carried out in environments with weak or deficient corporate governance and internal control structures. Dechow et al. (1996) did not limit themselves to characterizing the environment where such practices take place, but also studied their effects and consequences, and documented how accounting fraud imposes severe costs on the firms involved, experiencing abnormal returns of an average of 7% of the share price at the date of public disclosure of the manipulation, as well as significant increases in the interest of debt.

Another interesting paper is that of Beneish (1999), who investigated the incentives and consequences of accounting irregularities. Based on a sample of 64 firms that engaged in the infractions identified by the SEC between 1983 and 1992, he provided evidence that managers exercised their stock options in periods when accounting results were manipulated upwards. In terms of consequences, he found no evidence that the monetary penalties imposed by the SEC were effective in repressing these behaviors.

Further, Palmrose et al. (2004) and Erickson et al. (2004) investigated some effects of accounting fraud; the former studied the market reaction to financial statement restatement announcements and documented that, when the restatement was caused by accidental or unintentional accounting errors, experiencing negative abnormal returns, on average, of 2%, very different from restatements arising from intentional or deliberate irregularities, where the average negative abnormal return increased to 14%. Erickson et al. (2004) examined the tax costs associated with frauds that involve artificially inflated earnings, finding evidence, based on a sample of 65 companies between 1996 and 2002, that, because of such fraudulent behaviour, they voluntarily assumed a tax excess cost, on average, of 8% over the statutory corporate income tax rate.

The study of Acito et al. (2009) is the first to examine the materiality from a qualitative approach, analyzing 244 errors made by listed companies in the recording of operating leases between 2004 and 2006. They analyzed the determinants of the materiality judgments on which companies relied to correct such errors, either in the form of restatement, required in the case of material errors, or in the form of catch-up adjustment, in the case of non-material errors, concluding that the decision on one or the other accounting solution was motivated by both quantitative and qualitative materiality factors.

Keune & Johnstone (2014) studied the extent to which audit committee expertise affected the probability of recognizing accounting errors and, using a sample of 340 errors detected between 2003 and 2006, provided evidence that committees with more experienced members were less permissive and tolerant to errors committed by managers, as opposed to less experienced committees. Also relevant is the work of Donelson et al. (2017), which documents a statistically very significant relationship between the quality of internal control and the likelihood of engaging in accounting fraud, as internal control weaknesses provide managers with opportunities to be involved in these practices.

Finally, the work by Acito et al. (2019), which is possibly the closest to this paper, reviewed the comments on the materiality of accounting errors included in the responses of listed companies to 108 financial reporting requirements made by the SEC between 2009 and 2015. The authors highlighted how managers generally use quantitative levels of materiality, generally referring to the accounting earnings, while in contrast, there appear to be notable differences in the way in which qualitative materiality is assessed.

In short, and taken as a whole, the studies mentioned above show, following similar methodological approaches, the importance of the internal control environment and the quality of corporate governance as factors in the prevention of accounting irregularities, as well as the heavy penalties that their public knowledge imposes on companies, both for the significant destruction of value they cause and for the additional tax costs they must assume. Although none of the studies mentioned above refers specifically to accounting infractions committed by companies in bankruptcy proceedings, they do illustrate to the reader the context in which they take place.

3. Research design

3.1. Relevant accounting irregularities in the Spanish insolvency proceedings

The Spanish Bankruptcy Code allows for the opening of the phase of the so-called qualification section in the following cases: when an arrangement signed with creditors has

[6] AEERs issued since 1999 are currently available in the SEC's website, although the list is not a complete and exhaustive compilation of all of them. It can be accessed at https://www.sec.gov/divisions/enforce/friactions.htm.

been approved that could be particularly harmful to them; when, once the agreement has been reached, it is not complied with by the insolvent company; or when the liquidation phase of the company is opened, either at the request of the company itself, the creditors or by decision of the judge. In all these situations, the accounting quality of the company will be assessed.

From an accounting point of view, the insolvency proceeding will, in any case, be classified as culpable, as opposed to fortuitous, in those situations in which the debtor substantially fails to comply with the duty to record the accounts, has recorded double accounts or commits "*an irregularity relevant to the understanding of its asset or financial situation*" (art. 443.5 of the Spanish Bankruptcy Code). It is the judge who, based on the proposal that may be made by the insolvency administration, any creditor or the Public Attorney's Office, must decide on the existence or not of such irregularities.

Also, it is important to point out that the concept of a relevant accounting irregularity, as interpreted by the Spanish Supreme Court (notably, in its Sentence of January 16, 2012, *Ediciones del Prado Sentence*), encompasses both quantitative and qualitative aspects, since by relevant should be understood those breaches that are important enough to influence the decision of a reasonable user of the accounting information, with a basic understanding of the accounts and of what they may represent. It is also important to point out that it is not necessary to prove the existence of concrete damage to creditors; the mere potential for such damage to materialise is sufficient.

This reasoning led the Supreme Court to reject the classical distinction between unintentional errors and intentional irregularities, which, although they are deviations from the normative framework for very different reasons, as stated in the work of Hennes et al. (2008), are assimilated in Spanish insolvency law. In other words, in Spain, accounting irregularities, even in the case of an unintentional error, can lead to the classification of an insolvency proceeding as guilty and the imposition of a penalty on the directors of the company. This legal approach is different from the concept of accounting fraud consolidated in the literature. Since the seminal work of Beasley (1996), published studies do not include unintentional errors, but only material irregularities committed to convey a distorted image of the accounting information.

This procedure of qualification of irregularities in Spain has been subject to criticism, and thus, Gurrea (2016) argues that, under Spanish law, the paradox can arise whereby a company is labelled as an infringer and, thus, the insolvency proceeding is qualified as culpable, even if it has made unintentional errors and its insolvency situation has been generated by fortuitous circumstances, and, conversely, that accounting irregularities - even if intentional - are not punished if the qualification section is not opened.

Likewise, and as we have seen, Spanish insolvency law requires that accounting irregularities must be relevant to the understanding of the debtor's financial situation. As Quijano (2012) rightly writes, the correct interpretation of the scope and meaning of "relevant accounting irregularity" requires the collusion of these three elements: "*there must be an accounting irregularity; this irregularity must be relevant; and it must be relevant for understanding the patrimonial or financial situation of the insolvent debtor*" (Quijano, 2012, 365)[7].

Thus, in the first place, there must be a breach of the accounting standards, whether intentional or not, as interpreted in the *Ediciones del Prado Sentence*, whether by action or omission. Secondly, it is not enough that there is an irregularity, but it must also be sufficiently significant, an aspect that requires an evaluation by judges and Courts, who must assess its relevance. Third, once the irregularity has been committed, and once its relevance has been determined, it is necessary that it obstructs the correct understanding of the economic and financial situation of the company, since there may be significant irregularities, but which objectively do not affect the understanding of the debtor's position, or irregularities of lesser quantitative importance, but which qualitatively affect the correct understanding of the situation of the company.

It follows that, as in the accounting world, the relevance of the irregularity is a matter of professional judgment, since the Spanish legislator has placed in the hands of judges and Courts the final decision as to whether, in each specific case, the infringements detected are or are not relevant for the final classification of the insolvency proceeding as culpable or fortuitous. In other words, the regulator has intended that decisions on the materiality of an accounting irregularity should be based on both quantitative and qualitative considerations, instead of using simple rules of arithmetical computation of materiality referring to accounting magnitudes such as earnings, equity, total assets, or revenues[8].

This leads us to formulate the following first hypotheses, expressed alternatively:

> ***H1****: The probability of considering a relevant and specific accounting irregularity is directly related to its amount.*

Also, the assessment of the accounting situation of the company in insolvency proceedings requires a meticulous task of analysis, and there are no bright-line rules in the insolvency regulation, since the evaluation of what is called "relevant" in the insolvency field and "material" in the accounting field, both in its quantitative and qualitative aspects, is considered a matter of professional judgment.

Therefore, our second hypothesis is expressed as follows, also expressed alternatively:

> ***H2****: The probability of considering a relevant and specific accounting irregularity is directly related to its qualitative aspects.*

3.2. The role of judges and Courts in the assessment of accounting irregularities

As Hanlon et al. (2022) have argued, judges play a central role in the enforcement of business laws, which is particularly relevant, in the view of Gennaioli & Rossi (2010), in bankruptcy procedures, either directly or through the appointment of insolvency administrators (administrators). As Bris et al. (2006), Chang & Schoar (2006) and Sánchez-Vidal et al. (2023) show, the outcome of judicial proceedings can be very different depending on the characteristics of the judge in charge of the proceeding, sometimes being oriented towards creditors and sometimes protecting the debtor. This

[7] It is important to note that an accounting misstatement may be relevant in a bankruptcy context, but not be so in the civil, tax (called *substantial accounting anomalies* of article 184.3 of the *General Tax Law*) or criminal (labeled *proper accounting misrepresentation* in accordance with article 290 of the *Criminal Code*). And, conversely, the infraction may be punishable under civil, tax or criminal law, and not be so for the purposes of insolvency proceedings.

[8] In fact, in most of the sentences we have examined for the preparation of this research, there is a perfect translation of the bankruptcy "relevance" to the accounting "materiality". So, the sentences show that on many occasions, the judges analyze the accounting situation of the companies in insolvency proceedings by referring to the accounting and auditing regulations on materiality.

fact is particularly evident in the US judicial system, where, as described by Sánchez-Vidal et al. (2023), the company in insolvency proceedings can choose where to file for insolvency, which encourages companies to prefer pro-debtor judges. This is not the case in Spain, where companies must necessarily file for bankruptcy in the Mercantile Courts of the province in which they are domiciled, so it is not possible to engage in *forum shopping*.

As we have previously mentioned, relevant accounting irregularities must be assessed in the first instance by mercantile judges, who are not accounting experts, but who have received specific and specialized training in economic matters and have experience in judging accounting issues[9]. However, we understand that the professional criteria of the judge may differ from those adopted by the auditor, for several reasons; firstly, because the personal and professional profile of the judge is very different from that of the auditor, especially in terms of training; secondly, judges are not in the market, so their distance and independence from the company in insolvency, both economic and psychological, could be better safeguarded, and thirdly, and what seems most relevant to us, while the auditor verifies the annual accounts and concludes when issuing an overall opinion on the same, it could happen that the judge, when assessing the accounting situation of the insolvent companies, would take into account not only the strictly accounting aspects, but also the context and circumstances of the case, such as the commission of unlawful acts (fraudulent misappropriation of assets), the aggravation of the insolvency due to the delay in filing for insolvency, or the intentional or unintentional nature of the infraction committed.

Therefore, we understand that how the judge assesses the materiality of the infringements could differ significantly from how the auditors do, Judges, unlike auditors, do not use materiality levels referring to specific accounting magnitudes. This is something already highlighted by Keune & Johnstone (2014) and that we have appreciated in our review of numerous sentences.

Thus, the question that calls for our interest is whether or not the judges who assume the insolvency proceedings in the first instance, who are specialized, have the same perception of the relevant accounting irregularities as those judges who, in the second instance, that is, in the Provincial Courts, review the sentences that are appealed and, as they are not specialists in insolvency matters, they cannot be attributed specific accounting knowledge have, a priori, less specific accounting preparation. Thus, two possibilities may arise here: if the mercantile judges, who are specialists, were more oriented towards the protection of third-party creditors, they would attach greater importance to accounting matters than non-specialist judges, which would be reflected in the application of more strict quantitative and qualitative materiality levels; on the other hand, if they tend to protect the debtor company, they would attach less importance to accounting matters, which would be reflected in higher materiality thresholds.

A priori, it is not possible to predict whether specialized judges, because of their specific training in these matters, have a different perception of irregularities than non-specialized judges and, therefore, whether there are differences between their respective decisions, wich remains an open question subject to empirical verification. Consequently, our third hypothesis, also expressed in alternative form, is stated as follows:

> ***H3**: Judges' decisions on relevant accounting irregularities are conditioned by their level of specialization.*

3.3. Sanctions arising from relevant accounting irregularities

It is well documented in the literature that lawsuits impose significant costs on companies, both direct and indirect (Bhagat & Romano, 2002; Coffee, 2006), which also occurs in bankruptcy proceedings and is manifested in different ways, the most important of which are the difficulty or impossibility of obtaining financing and the stricter conditions with suppliers. However, and as far as we are concerned here, it seems appropriate to verify whether there is a causal link between the commission of relevant accounting irregularities and the consequences that, in terms of penalties, such conduct could induce.

In effect, as regards the consequences of the insolvency proceeding classified as culpable for the commission of relevant accounting irregularities, articles 455 and 456 of the Spanish Bankruptcy Code establish that the judgment so declaring will determine who are the economic agents affected by such verdict, which may be some or all of its directors, liquidators or managers; the period of disqualification as directors, between a minimum of two years and a maximum of fifteen years, depending on the gravity of the facts and the amount of the damages caused; the obligation to return the assets that they may have obtained unduly from the assets of the debtor company, and, if applicable, the compensation for the damages occasioned. Likewise, the judge may sentence the affected persons to cover all or part of the bankruptcy deficit when their conduct has generated or aggravated the insolvency.

As we can see, Spanish legislation provides for the imposition of sentences that can be very severe, which shows the importance that the authorities have given to the quality and integrity of the accounting information in bankruptcy proceedings. However, we are not aware of any studies that analyze the causal relationship between the materiality of the irregularity committed and the severity of the sentence received[10]; sentence which, as we have seen, is the result of the joint assessment by judges and Courts of the accounting irregularities committed, of the existence or not of the displacement abroad of the bankrupt company's assets and of the aggravation of the insolvency. Thus, the fourth of our hypotheses is stated as follows:

> ***H4**: The severity of sanctions is conditioned by the materiality of the irregularity.*

4. Models, sample and descriptive statistics

4.1. Model and variables for testing hypotheses H1, H2 and H3

To test the first three hypotheses, we will estimate the parameters of a logistic regression of the binary variable representing the existence of relevant accounting irregularities on a set of independent variables, whose generic form is:

[9] Judges specializing in commercial matters have to pass a selection process and receive specific training for a period of seven weeks: https://www.poderjudicial.es/cgpj/es/Servicios/Acceso-a-la-categoria-de-Magistrado-a-especialista/Mercantil/. We are grateful to an anonymous reviewer for this suggestion.

[10] Beneish (1999) conducts a descriptive analysis of the sanctions received by companies that violate accounting standards, but without establishing a causal relationship between the magnitude of the infraction and the severity of the sanction imposed.

$$REL_i = \alpha + \beta_1 QUANT_i + \beta_2 QUAL_i + \beta_3 ESP_i + \beta_4 SIZE_i + \beta_5 LEV_i + \beta_6 GROWTH_i + \beta_7 LOSSES_i + \varepsilon_i \quad (1)$$

In which, for company i, REL_i, is $\ln \frac{P_{REL}}{1-P_{REL}}$, the probability that the judge or Court considers that a relevant accounting irregularity has occurred. In accordance with the hypotheses put forward, the prediction is that all the coefficients associated with the treatment variables, which we will characterize below, will be positive and statistically significant.

According to Maddala (1991), the use of a logistic model is appropriate if, as in our case, the real frequency of accounting violations in the total population of companies is unknown, since this fact does not affect the coefficients associated with the explanatory variables of the model. On the other hand, as Beasley (1996) argues, it can affect the constant term, a circumstance that would cause some bias if the model were used for predictive purposes, which is not our objective.

The first of the treatment variables included in the model [1], $QUANT_i$, represents the materiality in its quantitative expression, which captures the magnitude of the accounting irregularity about a reference figure, generally earnings, equity, net sales, or total assets. Although, as Acito et al. (2009) have argued, earnings is the dominant quantitative benchmark in research on materiality, in our case we do not believe it is appropriate and have opted to use net sales, because, in the specific context of this research, a large number of the companies in our sample have negative or very low earnings and/or equity, which, as Keune & Johnstone (2014) have reasoned, would give rise to negative materiality thresholds or close to zero. In addition, reduced denominators add volatility to the variables and can lead to outliers. According to our first hypothesis, the coefficient associated with this variable can be expected to be positive and statistically significant.

The second treatment variable that we incorporate is $QUAL_i$, the expression of qualitative materiality, about whose characterization we agree with Acito et al. (2019) that this is an issue on which there are no defined or concrete guidelines. Thus, the SEC, in *Staff Accounting Bulletin No. 99* (SEC, 1999), identifies different qualitative considerations on the materiality of accounting errors, and in a very similar way, the American Institute of Certified Public Accountants (AICPA), in *Statements on Auditing Standards No. 107* (AICPA, 2006), the Public Company Accounting Oversight Board (PCAOB) in *Auditing Standard No. 14* (PCAOB, 2010) or in Spain the *Instituto de Censores Jurados de Cuentas* (ICJE), in its *Guide No. 38* (ICJCE, 2014), provide a list of indicative criteria for the analysis of qualitative aspects to help auditors in their assessment of materiality.

To provide content to our qualitative variable, we have used those factors included in AICPA (2006) that we consider relevant in the context of our research, and which are practically replicated in ICJCE (2014). Thus, we have considered the change caused by an accounting irregularity in the sign of net income (from negative to positive), the reduction of the relative level of debt by more than 20% of its right value, the change in the sign of the working capital (from negative to positive) and the discovery of hidden sales. Following the cumulative approach suggested in Acito et al. (2009), we have assigned one point to each of these qualitative elements, forming a scale from zero to four points, representing from the non-existence of qualitative materiality (zero points) to its maximum level of four points. According to our second hypothesis, we expect the coefficient associated with $QUAL_i$ to be positive and statistically significant, which would indicate that, in their assessment of materiality, judges and Courts also consider qualitative factors that may hinder or impede the correct understanding of the debtor's financial situation.

The third treatment variable is the degree of specialization of the judges, ESP_i, which will take the value 1 when the judge in charge of assessing the accounting irregularity is a judge in charge of a Mercantile Court, specialized in bankruptcy matters and, therefore, experienced in accounting matters, and 0 in the case of a Provincial Court, which is a court of appeal without specialist knowledge in these matters. If the specialist judges are stricter in their assessment of irregularities, the coefficient associated to ESP_i will be positive and significant; and vice versa, if they are more permissive, it will be negative and significant, and if there are no appreciable differences between one and the other, it will yield a non-significant coefficient at the conventional levels.

Our model [1] also incorporates four control variables; the first of these is size, $SIZE_i$, since, although practically all the companies in our sample are small, the literature on accounting fraud provides theoretical predictions of all kinds and very diverse empirical results, and thus, while Lennox & Pittman (2010) find a positive relationship between size and material misstatements, Feroz et al. (1991) document a negative relationship, although it is true that the important report by Beasley et al. (2010), which studied accounting fraud in the United States during 1997 and 2007, revealed that firms of all sizes were involved in this behavior. We will express it as the natural logarithm of total assets at the end of the fiscal year.

The second of the controls is leverage, LEV_i, since high relative levels of debt can generate incentives to manipulate accounting information and mask the true financial situation (Acito et al., 2009; Beneish, 1997; Dechow et al., 1996); likewise, its inclusion in the model [1] allows us to control for distress. It should be defined as the ratio of total debts to total assets at year-end (Benito López & Martínez Conesa, 2002).

We will also control for growth, $GROWTH_i$, since, as documented by Beasley (1996) and Lennox & Pittman (2010), among many others, both rapid growth strategies and declines in the level of revenues could generate, for different reasons, incentives for accounting violations; it will be represented by the annual growth in sales. And finally, we will control for the existence of losses, $LOSSES_i$, which will be expressed in binary terms, taking the value 1 if the company incurred negative results and 0 otherwise (Beasley, 1996; Acito et al., 2019; Lennox & Pittman, 2010).

It is important to note that, for the five control variables included in the model [1] to capture the true situation of the companies and not the distorted values because of the accounting irregularities committed, we have adjusted their numerical values for the effect of such infractions, either they are considered relevant or not in the sentences. We estimate the model [1] and robustness tests using robust standard errors.

4.2. Model and variables for testing hypotheses H4

I order to address the empirical contrast of the fourth hypothesis and verify to what extent the magnitude of the accounting irregularities and the degree of specialization of the judges influence their sentences, we must take into account, as we have indicated above, that the sentences can consist of disqualifying the directors, liquidators or managers, obliging them to restitute the assets improperly extracted, and imposing an indemnification for the damages caused. Of

these three possible effects, only the first one, disqualification, and the third, restitution, can, a priori, have a causal relationship with the accounting violations, since the second, the return of assets, is caused exclusively by their improper disposal and not by the conduct of the accounting decisions.

To empirically test whether the relevant accounting irregularities influence penalties, we will estimate, with cross-sectional data only, the parameters of the following linear regression model:

$$DISQ_i = \alpha + \beta_1 QUANT_i + \beta_2 QUAL_i + \beta_3 ESP_i + \beta_4 UPLIFT_i + \beta_5 AGGRAV_i + \varepsilon_i \quad (2)$$

In which the dependent variable, $DISQ_i$, will capture the years of disqualification that the judge or Court imposed, taking values between zero and fifteen. And in addition, to verify the extent to which accounting irregularities can influence the imposition of indemnifications, the model [2] will modify its econometric specification to a logit model, in which the new dependent variable, $INDEM_i$, will adopt a dichotomous expression, taking a value of 1 if the sentence requires indemnification and 0 otherwise.

The treatment variables $QUANT_i$ and $QUAL_i$ have the same specification as in model [1]. In the case that judges consider the quantitative materiality of accounting irregularities to impose sentences, $QUANT_i$ will show a positive and significant coefficient; if it also considers its qualitative elements, $QUALIT_i$ will exhibit the same positive sign and significance. In this model [2], the specialization of the judges, ESP_i, operates rather as a control variable, to the extent that this characteristic may influence the greater or lesser severity of the sentence, without it being possible for us to predict either the sign or the significance of its coefficient.

We also incorporate two additional controls since the sentences are imposed based on considering the gravity of the accounting irregularity in concurrence with other conducts of the company in bankruptcy. The first of these is to control the impact on the sentence of the fraudulent lifting of assets, represented by the binary variable $UPLIFT_i$, which will take the value 1 if this situation occurs, and zero otherwise, and the second, to control the existence of aggravation of insolvency as a result of the delay in filing for bankruptcy, $AGGRAV_i$, also dichotomous, and which will take the value 1 if this circumstance has occurred and 0 otherwise.

4.3. Models, sample, and descriptive statistics

To conduct the empirical testing of the hypothesis we have put forward, we have accessed the database of the *Judicial Documentation Center* (CENDOJ), which is part of the Spanish Ministry of Justice, and collects sentences issued by judges and courts. Not all rulings are publicly available, but only those that, due to their technical content or their social impact, have a special relevance, establish a new legal interpretation, unify the doctrine on a controversial issue or resolve new or complex procedural issues.

We have configured our sample by analyzing an initial set of 235 sentences available in CENDOJ, issued between January 2020 and March 2023, which pronounced on the accounting situation of companies in insolvency proceedings, and we have obtained their annual accounts from the SABI database. After eliminating 40 of them in which the company failed to comply with the obligation to bookkeeping, 17 whose accounts were not available in SABI, another 52 in which the sentence did not include a precise quantification of the irregularity committed and 5 in which the accounting irregularity was greater than 100% of the revenues, extreme values that are common in empirical studies on insolvency (López-Gutiérrez et al., 2015), the final sample contains 121 sentences, as shown in Panel A Table 1, in which 62 concluded that the company committed a relevant accounting irregularity (51%) and 59 that considered that the irregularity committed was not relevant, or that, if it was relevant, it was not relevant for the purposes of understanding the debtor's financial situation (49%). Likewise, 66 of the sentences (55%) were issued by specialized judges and finalized in the Mercantile Courts, while the remaining 55 (45%) were issued, on appeal to the Provincial Courts, by non-specialized judges. Given that in some provincial capitals there are no exclusively Mercantile Courts, as they also deal with civil proceedings, we have verified that all the sentences in our sample have been issued by specialist judges who perform their function in pure Mercantile Courts.

Table 1. Sample derivation and distribution of sentences by type and Court

Panel A: Sample derivation	Number	Frequency
Sentences on relevant accounting irregularities 2020-2023	235	100%
Less: companies in bankruptcy proceedings without accounting records	(40)	17%
Less: annual accounts not available in the Mercantile Registry	(17)	7%
Less: sentences with no precise quantification of the irregularity	(52)	22%
Less: irregularities with a materiality level greater than 100% of revenues	(5)	2%
Final sample of companies included in the study	121	51%
Irregularities considered relevant to the understanding of the financial situation	62	51%
Irregularities considered not relevant for understanding the financial situation	59	49%
Firm sentences issued by Mercantile Judges	66	55%
Firm sentences issued by Provincial Courts	55	45%
Panel B: Distribution of sentences by type and Court	ICRi =1	ICRi =0
Firm sentences issued by Mercantile Judges	44 (67%)	22 (33%)
Firm sentences issued by Provincial Courts	18 (33%)	37 (67%)

Sample characteristics and definition of variables in the Appendix.

Panel B of Table 1 shows the distribution of sentences according to the direction of the verdict and the judicial body issuing them. Thus, of the 66 sentences issued by mercantile judges, 44 of them, 66%, concluded with the existence of relevant irregularities, compared to 22 sentences, 34%, which did not consider that the infringements committed reached a sufficient degree of relevance. Of the 55 judgments issued by the Provincial Courts, 18 (33%) confirmed the existence of relevant accounting irregularities, while in the other 37 (67%), the Court did not consider the irregularities to be relevant.

Table 2 below presents the distribution of the accounting irregularities identified in the 121 sentences, a total of 137, the most frequent being those related to the incorrect valuation of assets, either due to insufficient or non-existent accounting recognition of impairment of non-current assets (12%) and of accounts receivables (27%) or due to irregularities in the valuation of inventories (18%). Unregistered liabilities are also frequent (13%).

Table 3 shows the main descriptive statistics, as well as the t-statistics and the Mann-Whitney Z-statistics, which allow us to contrast the differences in the values reached by the variables in the subsamples of sentences in which relevant accounting irregularities are observed and in which such relevance is not considered. In relation to the dependent variables,

Table 2. Type and frequency of relevant accounting irregularities committed

Type of accounting irregularity committed	Frequency	%
Impairment of unrecorded non-current assets	16	12%
Unrecorded impairment on investments in group companies	7	5%
Improper activation of tax credits	13	9%
Incorrect valuation of inventories	24	18%
Incorrect valuation of accounts receivables	37	27%
Unrecorded liabilities	18	13%
Unrecorded expenses	13	9%
Hidden revenues	9	7%
Totals	137	100%

Table 3. Descriptive statistics

Variables	Mean	St. Dev.	25%	Median	75%	t-test	Z-stat
REL_i	0,545	0,501	0	1	1		
$DISQ_i$	2,038	2,310	0	2	3		
$INDEM_i$	0,372	0,486	0	0	1		
$QUANT_i$	0,290	0,261	0,031	0,250	0,467	-5,589 ***	-5,686 ***
$QUALIT_i$	1,256	1,012	0	1	2	-4,312 ***	-3,486 ***
ESP_i	0,641	0,483	0	1	1	-1,838 **	-1,833 **
$SIZE_i$	8,942	0,202	8,793	8,940	9,051	-1,299	-0,220
LEV_i	0,988	0,447	0,772	0,875	0,978	-0,536	-1,332
$GROWTH_i$	-0,104	0,633	-0,303	-0,098	0,086	-0,151	0,484
$LOSSES_i$	0,526	0,503	0	1	1	-2,040 **	-2,008 **
$UPLIFT_i$	0,145	0,354	0	0	1		
$AGGRAV_i$	0,244	0,432	0	0	1		

Sample characteristics and definition of variables in the Appendix.

the first of them, the commission of relevant accounting irregularities, REL_i, shows an average value of 0.545, while the representative variable of disqualification, $DISQ_i$, shows an average of 2.038 years, and the sentence to restitution, $INDEM_i$, shows an average of 0.372.

Regarding the dependent variables, the quantitative materiality, $QUANT_i$, has an average value of 0.290 (median 0.261), and the values of the t-statistics (-5.589) and the Mann-Whitney Z-statistics (-5.686), show a notable difference in the level of materiality of the accounting infractions committed in one type of judgment or another.

Considering these values, there is an appreciable difference between the materiality thresholds implicitly applied by the judges and Courts and those used by the auditors. However, in our opinion, this difference between the materiality for the purposes of insolvency proceedings and that conventionally applied for the purposes of issuing an audit opinion are not comparable, since the relevance of the irregularities in the insolvency proceedings leads to the fortuitous or culpable qualification, whereas in the audit field they have a completely different purpose, as is to issue an opinion on the true and fair view of the financial statements as a whole. Because of that, it would not be correct to affirm that judges and Courts are more permissive and tolerant than auditors by tacitly applying higher materiality thresholds.

The qualitative materiality, $QUALIT_i$, which, let us recall, is an index whose values range between 1 and 4 points, shows an average value of 1.256 (median 1), being significantly different in the subsample of companies with irregularities, compared with the subsample of those that did not commit irregularities, as revealed by the t (-4.312) and the Z (-3.486) statistics, indicating that judges and Courts clearly discriminate their assessment of infractions not only based on the quantitative dimension of materiality, but also on the basis of their qualitative aspects. Finally, regarding the statistics for the control variables, the size, $SIZE_i$, shows an average value of 8.942 (median 8.940), the leverage, LEV_i, a high mean of 0.988 (median 0.978) and the growth, $GROWTH_i$, is, on average, negative, with a mean of -0.104 (median -0.098) and a strong dispersion, based on its high standard deviation (0.633)

5. Main results

In Table 4 we present the results obtained from the regression of logit model [1]. In the first of the four columns we show the coefficients of the univariate regression of the dependent variable, REL_i, on the quantitative materiality, $QUANT_i$, exhibiting a positive and statistically very significant coefficient, with a pseudo R^2 of 25.5%. In the second column we carry out the same exercise, in this case with the qualitative materiality, $QUALIT_i$, in which the associated coefficient is also positive and highly significant, although the pseudo R^2 in this case drops to 9.2%.

In the third column we show the incremental contribution of qualitative materiality to the judicial decision on the relevance of the accounting irregularity, performing the bivariate regression of REL_i on the two dimensions of materiality, $QUANT_i$ and $QUALIT_i$, maintaining in both variables the

Table 4. Logistic regression results of the model [1]

$$REL_i = \alpha + \beta_1 QUANT_i + \beta_2 QUAL_i + \beta_3 ESP_i + \beta_4 SIZE_i + \beta_5 LEV_i + \beta_6 GROWTH_i + \beta_7 LOSSES_i + \varepsilon_i$$

Sample characteristics and definition of variables in the Appendix. Asterisks express statistical significance of logistic coefficient estimates at the 0.01 (***), 0.05 (**) and 0.10 (*) level. Coefficients associated to independent variables in normal font and t-statistics in italics. Marginal effects are computed at the means of the independent variables except for dummy variables, where it is the change in value from 0 to 1.

Variable	Predicted Sign	Quantitative Materiality only		Qualitative Materiality only		Quantitative and Qualitative Materiality		All variables		Marginal effects	
Intercept	?	-0,252	*-3,20* ***	-0,474	*-1,91* *	-0,123	*-3,5* ***	-0,001	*-2,63* ***		
$QUANT_i$	+	0,501	*4,15*			0,300	*3,81* ***	0,383	*3,06* ***	0,733	*5,47* ***
$QUALIT_i$	+			2,184	*2,89* ***	1,870	2,10 **	4,250	*2,8* ***	0,177	*3,66* ***
ESP_i	?							3,400	*1,92* **	0,090	0,21
$SIZE_i$	?							1,000	*1,11*	0,001	0,47
LEV_i	+							0,967	*2,32* **	0,003	2,34 **
$GROWTH_i$	+							0,990	*0,02*	0,003	1,42
$LOSSES_i$	+							14,060	*2,8* ***	0,388	3,01 ***
Sample size		121		121		121		121			
χ^2		27,12 ***		9,78 ***		31,9 ***		22,84 ***			
Pseudo-R^2		25,5%		9,2%		30,1%		44,6%			

positive sign and statistical significance -to a greater extent $QUANTIT_i$- and raising the pseudo R^2 to 30.1%. We can also see how the two variables lose statistical significance when integrated into the same model, which would indicate that both transmit part of the information together, due to a positive and statistically significant correlation between them of 33.1% (Pearson)[11].

This evidence shows that, in the evaluation of materiality, the assessment of quantitative and qualitative factors is both relevant and complement each other, indicating that judges and Courts carry out a complete analysis of accounting irregularities and take into account both dimensions of the problem. As stated by Acito et al. (2009), that the qualitative elements add severity to the infraction committed and increase the likelihood that it will be considered relevant to the understanding of the company's financial situation.

The fourth column shows the results of the regression of the complete model [1], incorporating the control variables and, as we can see, the coefficients linked to the three treatment variables, $QUANT_i$, $QUALIT_i$ and ESP_i, are positive and statistically very significant, which confirms the first three stated hypothesis and indicates that judges and Courts carry out a complete analysis of materiality when evaluating accounting irregularities in bankruptcy proceedings, taking into account both their quantitative and qualitative aspects.

Likewise, the positive sign and statistical significance of ESP_i shows that the degree of specialization of the judges clearly indicates a greater propensity to consider irregularities committed as relevant for understanding the situation of the insolvent company; in other words, specialist judges would be less tolerant with accounting infractions. This result is in line with the findings of Keune & Johnstone (2014), who have documented a lower tolerance of audit committees with a higher level of specialization of their members. Regarding the control variables, leverage, LEV_i, and the occurrence of losses, $LOSSES_i$, were found to be significant and with the expected positive sign, while size, $SIZE_i$, and growth, $GROWTH_i$, were found to be non-significant. It seems interesting to note the lack of statistical significance of size, in contrast with the significant results of Lennox & Pittman (2010) and Feroz et al. (1991), as this could indicate that independence of Courts and judges are not influenced by how large the company is.

The fifth and last column show the average marginal effects, which allow us to verify the extent to which the independent variables affect the probability of receiving a sentence for a relevant accounting irregularity in the context of the population of companies under study. Thus, a variation of 1% in the independent variable $QUANT_i$ induces an increase of 73.3% in the probability of considering the violation committed as relevant, and the same variation 1% in $QUALIT_i$ leads to an increase of 17.7% in this probability. The pseudo R^2 rises in relation to the three previous models, reaching 44.6%, and the variance inflation factor, which shows an average value of 1.28, with a maximum of 1.55 in the case of the $LOSSES_i$, allows us to rule out the sensitivity of our results to the presence of multicollinearity.

About the empirical analysis of the consequences that, in the form of penalties, can arise from the commission of relevant accounting irregularities, Table 5 shows the results of the linear regression of the model [2], using the subsample of the 62 sentences that concluded with the existence of such infractions. The first column shows those obtained by taking the dependent variable, $DISQ_i$, as the number of years of prohibition to administer that is imposed in the sentence to hold such a position, and, as we can see, none of the variables representing materiality, $QUANT_i$ and $QUALIT_i$, maintain statistical significance, which shows that, although both dimensions are taken into account in the assessment of accounting infractions, they are no longer one of the determining factors of the penalties. As for the specialization of judges, the results indicate that this attribute also lacks relevance, and finally, the coefficients associated to the controls incorporated into the model [2], the displacement of assets, $UPLIFT_i$, and the aggravation of insolvency, $AGGRAV_i$, show positive signs and are statistically significant, although the second of them is more moderate, with a pseudo R^2 that reaches a value of 15.8%.

Table 5. Linear and logistic regression results of the model [2]

$$DISQ_i(INDEM_i) = \alpha + \beta_1 QUANT_i + \beta_2 QUAL_i + \beta_3 ESP_i + \beta_4 UPLIFT_i + \beta_5 AGGRAV_i + \varepsilon_i$$

Sample characteristics and definition of variables in the Appendix. Asterisks express statistical significance of logistic coefficient estimates at the 0.01 (***), 0.05 (**) and 0.10 (*) level. Coefficients associated to independent variables in normal font and t-statistics in *italics*.

Variable	Predicted Sign	Years of prohibition to administer, $DISQ_i$ (OLS)		Compensation of damages, $INDEM_i$ (logistic)	
Intercept	?	0,328	0,24	0,428	0,54
$QUANT_i$	+	2,209	1,34	0,420	0,41
$QUALIT_i$	+	0,306	0,83	1,132	0,75
ESP_i	?	1,173	1,62	0,712	0,72
$UPLIFT_i$	+	1,552	2,06 **	3,082	0,04 **
$AGGRAV_i$	+	1,177	1,75 *	2,026	0,37
Sample size		62		62	
F (c^2)		3,54 ***		5,48 ***	
Adj-R^2 (Pseudo-R^2)		15,8%		16,0%	

In the second version of the logit model [2], in which the dependent variable, $INDEM_i$, captures whether the sentence condemns to compensate for the damages caused, the coefficients linked to both quantitative materiality, $QUANT_i$, and qualitative materiality, $QUALIT_i$, are not statistically significant either, indicating, consequently, that the relevant accounting irregularities have no appreciable impact for the purpose of determining compensation. The specialization of the judges, ESP_i, is also not significant, and does not have any impact on the greater or lesser severity of the sentence. With reference to the control variables, $UPLIFT_i$, the exit of assets from the company in insolvency proceedings, maintains statistical significance, but $AGGRAV_i$, the worsening of insolvency, does not. The pseudo R^2 remains in very similar terms, 16.0%.

Consequently, the results obtained from the regressions of model [2], both in its linear and logistic version, do not confirm the fourth of the hypotheses formulated, since neither the dimensions of materiality, nor the degree of specialization of the judges have a significant influence on sentences. These findings indicate that both the disqualification to administer and the compensation are judicial decisions for whose adoption the commission of accounting irregularities are left aside, and in which the displacement of assets and the aggravation of insolvency are the facts that are considered as determinants of the penalties, thus suggesting that, although the legislator has wanted to give considerable relevance to accounting issues, the empirical evidence shows that, in view of our results, their real consequences are not significant.

In sum, taken as a whole, the empirical findings that we have just presented and discussed allow us to affirm that judges and Courts carry out an examination of all dimensions

[11] We are grateful to an anonymous reviewer for this suggestion.

of materiality, both its quantitative and qualitative aspects, with the influence of their degree of specialization also being very significant. These results confirm the assertions of Hanlon et al. (2022) and Gennaioli & Rossi (2010), which assign judges and Courts a fundamental role in the resolution of bankruptcy proceedings. And as for the incidence of accounting irregularities for the imposition of penalties, we have documented how relevant accounting irregularities lack significant effects and do not form part of the core of judicial decisions[12].

6. Additional analysis and robustness tests

The purpose of the following tests is to ensure the robustness of our empirical results and to extend the evidence we have documented by carrying out some complementary exercises. Thus, firstly, we will apply the Romano-Wolf correction to control the impact that the use of a single model to test the first three hypotheses may have on our findings; secondly, we will analyze separately each of the components of qualitative materiality, in order to verify the impact that each of them has on the relevance of irregularities; thirdly, we will replace the variable representing the specialization of judges with other alternatives that reflect their level of experience; and finally, we will analyze to what extent the judicial environment can condition or influence decisions on materiality.

6.1. Control for multiple hypothesis testing

The use of a single econometric model to simultaneously test several hypotheses, which is common in empirical research, opens the possibility of committing any type I error among such hypotheses, known as the *family wise error rate*, and thus producing a false positive. As Romano et al. (2010) have shown, ignoring this fact can cause problems, since the probability of rejecting at least one true hypothesis is high.

The Romano-Wolf correction addresses this problem and asymptotically controls for the effect on the empirical results of a test with several joint hypotheses, based on the resampling algorithm described in Romano & Wolf (2016), and provides the adjusted *p*-values of the treatment variables in the model[13]. Table 6 collects the *p*-values obtained by applying the Romano-Wolf correction to the regression results of the lineal regression model [1], in which we have contrasted and confirmed the first three hypotheses, the materiality of the infringement in its two aspects, and the specialization of the judges.

As we can see, the correction has adjusted the statistical significance of the coefficients downwards, although they all remain above 90% and, in the case of materiality, both quantitative and qualitative, at 99%, that is, very similar to those reported in Table 4, which confirms that our empirical results are robust to multiple hypothesis testing and, with this, the hypotheses on the significance of materiality and on the influence of the judges' level of specialization.

[12] We have replicated our empirical tests characterizing quantitative materiality by taking as a reference the book value of total assets, adjusted for the effect of irregularities, obtaining results, not shown here, practically the same as those we have shown.

[13] Stata's *rwolf2* command allows the application of the Romano-Wolf correction in a very simple way. According to Clarke et al. (2020), the correction is considerably more powerful than other multiple hypothesis testing procedures, such as Bonferroni.

Table 6. Control for multiple hypothesis testing (Romano-Wolf test)

Sample characteristics and definition of variables in the Appendix. Romano-Wolf step-down adjusted p-values. Asterisks express statistical significance of logistic coefficient estimates at the 0.01 (***), and 0.10 (*) level.

	Model p-value	Romano-Wolf p-value	
$QUANT_i$	0,002	0,009	***
$QUALIT_i$	0,004	0,009	***
ESP_i	0,055	0,099	*

6.2. Components of qualitative materiality

Our second complementary test will consist of analyzing separately each of the elements of qualitative materiality that we have previously grouped into a single index: the change, from negative to positive, in the sign of earnings, the reduction of the leverage ratio by more than 20% of its correct numerical value, the change in the sign of the working capital, from negative to positive, and the discovery of hidden revenues. Each of these qualitative factors can be assessed differently by judges and Courts, considering that the degree of gravity of each of them differs from one another, and, consequently, have a different effect on the assessment of the irregularity. Thus, the new specification of the logit model [1] is as follows:

$$\begin{aligned} REL_i = {} & \alpha + \beta_1 QUANT_i + \beta_2 \Delta EARN_i + \beta_3 \delta LEV_i + \beta_4 \Delta WC_i \\ & + \beta_5 HIDDEN_{it} + \beta_6 ESP_i + \beta_7 SIZE_i + \beta_8 LEV_i \\ & + \beta_9 GROWTH_i + \beta_{10} LOSSES_i + \varepsilon_i \end{aligned} \quad (3)$$

This incorporates the new variables $\Delta EARN_i$, which expresses the change in the sign of the result; δLEV_i, the reduction of the leverage ratio to more than 20% of its correct value; ΔWC_i, the change in the sign of working capital, and $HIDDEN_i$, the detection of hidden revenues. Table 7 shows the results obtained from the regression of model [3], in which, as we can see, of the four elements of qualitative materiality that we have considered, only two of them reach conventional levels of statistical significance, the change in the debt ratio, δLEV_i, and the occultation of sales, $HIDDEN_i$, maintaining the statistical significance of quantitative materiality, $QUANT_i$, of judicial specialization, ESP_i, and the existence of losses, $LOSSES_i$. However, when applying the

Table 7. Logistic regression results of the model [3]

$$REL_i = \alpha + \beta_1 QUANT_i + \beta_2 \Delta EARN_i + \beta_3 \delta LEV_i + \beta_4 \Delta WC_i + \beta_5 HIDDEN_{it} + \beta_6 ESP_i + \beta_7 SIZE_i + \beta_8 LEV_i + \beta_9 GROWTH_i + \beta_{10} LOSSES_i + \varepsilon_i$$

Sample characteristics and definition of variables in the Appendix. Asterisks express statistical significance of logistic coefficient estimates at the 0.01 (***), 0.05 (**) and 0.10 (*) level. Coefficients associated to independent variables in normal font and t-statistics in *italics*.

Variable	Predicted Sign	Qualitative materiality		Romano-Wolf p-values
Intercept	?	0,001	-2,39 **	
$QUANT_i$	+	0,547	3,13 ***	0,089 *
$DEARN_i$	+	0,408	0,80	0,208
$dLEV_i$	+	29,22	3,19 ***	0,089 *
DWC_i	+	6,876	1,64	0,327
$HIDDEN_i$	+	0,001	1,66 *	0,116
ESP_i	?	5,538	1,94 *	0,327
$SIZE_i$	?	0,985	0,81	
LEV_i	+	0,977	1,42	
$GROWTH_i$	+	0,999	1,26	
$LOSSES_i$	+	11,51	2,63 ***	
Sample size		121		
c^2		34,63 ***		
Pseudo-R^2		52,4%		

Romano-Wolf correction, only the change in leverage, δLEV_i, retains significance, although the p-value is lower, while the quantitative materiality, $QUANT_i$, decreases and the specialization, ESP_i, disappears[14].

In view of these results, it is clear that the change in leverage, δLEV_i, is the qualitative aspect that really has the greatest specific influence on the assessment of materiality, although we understand that this should not lead us to interpret that it is the only and exclusive element appreciated by the judges, but the most dominant one, since, in our opinion, qualitative materiality is a cumulative analysis process in which all its dimensions are evaluated jointly.

6.3. The experience of judges

Our next exercise aims to find out whether the greater or lesser experience of judges affects their appreciation of accounting irregularities, since, as described in the literature, this is an attribute that plays an important role in their decision making (Guenzel & Malmendier, 2020). In the specific case of judicial experience, Iverson et al. (2023) have shown that it is a determining attribute in the efficiency of bankruptcy proceedings, which raises our interest as to whether this circumstance could also influence the decisions on the materiality of irregularities.

In addition, the degree of experience could play a different role in specialist and non-specialist judges, since, as we have already mentioned, the former assume the competences of their respective Courts after a previous training period, so that their level of experience could have a lower impact than in the case of non-specialist judges, where a certain learning curve could be identified as they take on a higher number of cases.

To verify this question, we have carried out the regression of lineal regression model [1] replacing the variable representing specialization, ESP_i, with another variable that captures the level of experience, EXP_i, expressed as the logarithm of the number of sentences of qualification issued; in the case of the Mercantile Courts, by the judge in charge, and in the case of the Provincial Courts, by the magistrate in charge of the case, since the database from which we have obtained the sentences (www.elderecho.com) allows us to obtain this information.

Table 8 shows the regression results of this version of the model [1], and, as we can see, the coefficient of the EXP_i variable is not statistically significant, indicating that the degree of previous experience of the judges would not affect their perception of irregularities. We have also repeated this same exercise by running two separate regressions; The first, using the subsample of sentences issued by mercantile judges, specialists, and the second, the subsample of the sentences issued by the magistrates who are in charge of them in the Provincial Courts, non-specialists, obtaining in both cases the same results (not shown here), i.e., lacking statistical significance, which confirms that, in the case of the assessment of irregularities, and in contrast to what is suggested by Guenzel & Malmendier (2020) and Iverson et al. (2023), the judges' experience would not be a relevant factor in the Spanish insolvency context, although, as we have seen, their previous level of training would be.

[14]The mean VIF of the regression model [3] is 1.51, with a maximum of 2.24 in the case of the $LOSSES_i$ variable. The highest correlation between qualitative variables is those between $\Delta EARN_i$ and ΔWC_i (Pearson 35.12%; Spearman 37.05%) and between $\Delta EARN_i$ and δLEV_i (Pearson 30.45%; Spearman 29.91%).

Table 8. Logistic regression results of the model [1] (modified)

$$REL_i = \alpha + \beta_1 QUANT_i + \beta_2 QUAL_i + \beta_3 EXP_i + \beta_4 SIZE_i + \beta_5 LEV_i + \beta_6 GROWTH_i + \beta_7 LOSSES_i + \varepsilon_i$$

Sample characteristics and definition of variables in the Appendix. Asterisks express statistical significance of logistic coefficient estimates at the 0.01 (***), 0.05 (**) and 0.10 (*) level. Coefficients associated to independent variables in normal font and t-statistics in *italics*.

Variable	Predicted Sign	Judges' experience		Judges' experience	
Intercept	?	0,001	-2,28 **	0,001	-2,28 **
$QUANT_i$	+	0,373	3,24 ***	0,373	3,24 ***
$QUALIT_i$	+	4,107	2,93 ***	4,107	2,93 ***
ESP_i	?	1,148	0,44	1,148	0,44
$SIZE_i$	?	0,998	1,23	0,998	1,23
LEV_i	+	0,966	2,42 **	0,966	2,42 **
$GROWTH_i$	+	0,999	-0,31	0,999	-0,31
$LOSSES_i$	+	9,291	2,19 **	9,291	2,19 **
Sample size		121		121	
c^2		20,87 ***		20,87 ***	
Pseudo-R^2		42,0%		42,0%	

6.4. The effect of the judicial context on accounting irregularities decisions

As Hanlon et al. (2022) have written, there is growing empirical evidence of the significant influence that the environment has on all types of economic decisions, and in this sense, as Acito et al. (2009) have noted, a sort of *herding behavior* could occur, to the extent that precedent sentences and the levels of materiality implicitly selected in a given judicial demarcation could condition or influence decisions on accounting infractions.

Indeed, this situation could occur, especially considering that sentences issued in the Mercantile Courts can be appealed to the Provincial Court of the same province, but not in a different one, thus giving rise to a certain kind of "tacit rules", which would result in a certain adaptation or accommodation of the sentences to this tacit framework.

Huang et al. (2019) have investigated this question, although referring to the ideology of the judges, concluding that, in view of their evidence, and for the US case, there are no significant differences between some judicial circuits and others, although, in the Spanish case, Sánchez-Vidal et al. (2023), using statistics from Consejo General del Poder Judicial (*Spain's General Council of the Judiciary*), do find differences in the degree of efficiency, both between Courts and between provinces.

To this end, we have modified the logit model [1], replacing the ESP_i variable with five binary variables, each of them representative of the provinces in our sample with more than five sentences, either from the Mercantile Courts or Provincial Courts, corresponding to Asturias, AST_i, Madrid, MAD_i, Barcelona, BCN_i, Vizcaya, VIZ_i and Murcia, MUR_i. This procedure, developed in the seminal work of Bertrand & Schoar (2003), identifies the systematic and persistent effect of the judicial context of each province on the qualification of irregularities.

Table 9 shows the results obtained with this version of logit model [1], in which the coefficients of the variables representing materiality, $QUANT_i$ and $QUALIT_i$, maintain their significance, as well as two judicial areas, Asturias, AST_i, and Murcia, MUR_i, with a positive sign and modestly significant, which, in principle, indicates a greater propensity to attach greater relevance to accounting irregularities. However, when applying the Romano-Wolf correction, the significance disappears,

from which it can be inferred that, at least in terms of accounting qualification, there are no significant differences between provinces, and consequently there are no tacit rules or frameworks that could condition the criteria of the judges and Courts.

Table 9. Logistic regression results of the model [1] (modified)

$$REL_i = \alpha + \beta_1 QUANT_i + \beta_2 QUAL_i + \beta_3 DEMARCATIONS_i + \beta_4 SIZE_i + \beta_5 LEV_i + \beta_6 GROWTH_i + \beta_7 LOSSES_i + \varepsilon_i$$

Sample characteristics and definition of variables in the Appendix. Asterisks express statistical significance of logistic coefficient estimates at the 0.01 (***), 0.05 (**) and 0.10 (*) level. Coefficients associated to independent variables in normal font and t-statistics in *italics*.

Variable	Predicted Sign	Judicial demarcations		Romano-Wolf p-values	
Intercept	?	0,001	-2,74 ***		
$QUANT_i$	+	0,876	2,77 ***	0,029	**
$QUALIT_i$	+	4,799	2,68 ***	0,065	*
AST_i	?	4,038	1,66 *	0,218	
MAD_i	?	0,437	-0,87	0,212	
BCN_i	?	5,746	1,23	0,347	
VIZ_i	?	0,959	-0,03	0,455	
MUR_i	?	7,748	2,13 **	0,109	
$SIZE_i$	?	0,996	1,16		
LEV_i	+	0,961	1,81 *		
$GROWTH_i$	+	0,999	-0,53		
$LOSSES_i$	+	17,555	2,46 **		
Sample size		121			
c^2		23,39 ***			
Pseudo-R^2		47,9%			

7. Concluding remarks

Based on a sample of 121 sentences issued by Mercantile Courts and Provincial Courts, we have conducted an empirical analysis of the relevant accounting irregularities that are investigated in bankruptcy proceedings in Spain. Our results show that judges and Courts take into consideration both the quantitative and qualitative dimensions of the materiality of the infractions committed, and how judges who specialize in mercantile matters show stricter and less permissive levels of materiality than judges who are not specialists in this field. Regarding the penalties imposed in those cases in which the bankruptcy has been classified as culpable, neither the accounting infractions nor the specialization of the judges seem to have an influence on these penalties. Finally, our results do not support the evidence, documented in other research contexts, that more experienced judges show a different attitude towards accounting infractions than less experienced judges, nor do there appear to be tacit norms that apply in the different judicial districts in the evaluation of irregularities.

We consider that our study represents a novel contribution to the empirical literature on accounting infractions, both because it deals with an unprecedented issue, the assessment of regulatory compliance in bankruptcy proceedings, and because it analyzes how these matters are assessed by judges and Courts. However, it is necessary to bear in mind that our findings must be interpreted with the caution required by all research, and so, firstly, we must understand that they are inevitably limited by the configuration of the sample itself, confined to companies in a state of bankruptcy or imminent bankruptcy, so that extrapolating our results to other contexts would not be recommendable.

Second, the sample of firms we have used is characterized by being composed of small or very small firms, where the incentives, motivations, and opportunities to engage in irregular accounting behavior are notably different from those of larger size. Third, as Amiram et al. (2018) point out, it is not clear how many firms engage in irregular accounting practices without being detected, nor what the characteristics of those firms are, so the fact that our knowledge of accounting malpractice comes almost exclusively from the firms that were caught could lead to an imperfect perception of this problem and thus severely limit the interpretation of some of the previous results found in the literature.

And fourth, as Karpoff et al. (2017) consider, empirical results may be sensitive to the choice of database. In our case, the only available source is that provided by CENDOJ, which, as we have said, publishes previously selected sentences, although this fact cannot reasonably be expected to give rise to any selection bias affecting our findings.

However, despite these limitations, we believe that our results may be of interest to companies themselves, auditors, bankruptcy professionals (both lawyers and economists) and to the legislator. Finally, we believe that our work could stimulate other contributions in this same line of archival research, since there are opportunities to address yet unexplored issues, such as accounting infringements in the criminal and tax fields, or the causes and effects of penalties imposed on auditors, which could significantly improve our knowledge of these interesting issues.

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Conflicts of interest

The authors declare that they have no conflicts of interest.

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Appendix

Sample characteristics and variable definitions

The sample is integrated by 121 Spanish companies in bankruptcy proceedings that received sentences of qualification between January 2020 and March 2023, both from the Mercantile Courts and the Provincial Courts.

Dependent variables of models [1] and [2]	
REL_i	Binary variable that takes the value 1 if the judge or the Court declares the existence of relevant accounting irregularities, and 0 otherwise.
$DISQ_i$	In the first version of the model [2] (lineal regression), years of prohibition that the judge or the Court imposed on the company's directors, liquidators, and/or managers, taking values between zero and fifteen.
$INDEM_i$	In the second version of the model [2] (logit), it takes the value 1 if the sentence obliges to compensate damages, and 0 otherwise.
Treatment variables of models [1] and [2]	
$QUANT_i$	Quotient between the amount of the accounting irregularity and the net turnover for the year.
$QUAL_i$	Indicator whose value ranges between 0 and 4 to capture four qualitative dimensions of materiality: the change in the sign of the result (from negative to positive), the reduction by more than 20% of its correct value of leverage, the change in the sign of the working capital (from negative to positive) and the existence of hidden sales.
ESP_i	Binary variable that takes the value 1 when the accounting irregularity is appreciated by a specialist judge, and 0 otherwise.
Control variables of models [1] and [2]	
$SIZE_i$	Neperian logarithm of total assets.
LEV_i	Ratio of total liabilities to total assets at year-end.
$GROWTH_i$	Annual growth in sales.
$LOSSES_i$	Binary variable that takes the value 1 if the company incurred in a loss, and 0 otherwise.
$UPLIFT_i$	Binary variable that takes a value of 1 if there has been an uplift or fraudulent disposition of assets, and zero otherwise.
$AGGRAV_i$	Binary variable that takes the value 1 if the insolvency was aggravated as a result of the delay in the filing of the bankruptcy, and 0 otherwise.
Additional variables used in the complementary tests, models [3] and [4]	
$\Delta EARN_i$	Binary variable that takes the value 1 if the accounting irregularity committed resulted in a change in the sign of the result (from negative to positive), and 0 otherwise.
δLEV_i	Binary variable that takes the value 1 if the accounting irregularity committed resulted in a reduction of the leverage ratio by more than 20% of its correct value, and 0 otherwise.
ΔWC_i	Binary variable that takes the value 1 if the accounting irregularity committed resulted in a change in the sign of the working capital (from negative to positive), and 0 otherwise.
$HIDDEN_i$	Binary variable that takes the value 1 if hidden sales were discovered, and 0 otherwise.
EXP_i	Logarithm of the number of qualification sentences issued by each judge.
AST_i	Binary variable that takes the value 1 if the Mercantile Court or the Provincial Court that issued the sentence is in the demarcation of Asturias, and 0 otherwise.
MAD_i	Binary variable that takes the value 1 if the Mercantile Court or the Provincial Court that issued the sentence is in the demarcation of Madrid, and 0 otherwise.
BCN_i	Binary variable that takes the value 1 if the Mercantile Court or the Provincial Court that issued the sentence is in the demarcation of Barcelona, and 0 otherwise.
VIZ_i	Binary variable that takes the value 1 if the Mercantile Court or the Provincial Court that issued the sentence is in the demarcation of Vizcaya, and 0 otherwise.
MUR_i	Binary variable that takes the value 1 if the Mercantile Court or the Provincial Court that issued the sentence is in the demarcation of Murcia, and 0 otherwise.