



Audit fees and financial crisis: Evidence from the spanish manufacturing industries

*Honorarios de auditoría y crisis financiera: evidencia
de las industrias manufactureras españolas*

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Abstract

The international financial crisis plunged the Spanish economy in a downturn spiral from 2008 to 2010, with seven consecutive recession periods. During this period, Spanish companies faced growth and liquidity problems and credit constrains, which increased their business risk. The international literature emphasizes that there is a relationship between business risk and audit fees. This study considers if there is a relationship between time (the three years period when Spanish recession was higher and the following three-year period) and audit fees. We analyzed the financial statements and annual audit fees, obtained from SABI-Bureau Van Dijk database, from 2008 to 2013, charged by auditors to 119 manufacturing companies. The results obtained, despite positive and negative correlations between audit fees and other variables of our model, are not totally conclusive neither consistent. They point out to a tenuous relationship between time and audit fees, partially corroborating the American reality, but not the studies made in Australia, China, Sweden and South Korea.

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Keywords: Audit risk; Business risk; Audit fees; Economy downturn; Time

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Resumen

La crisis financiera internacional sumió a la economía española en una espiral descendente de 2008 a 2010, con siete períodos de recesión consecutivos. Durante este período, las empresas españolas enfrentaron problemas de crecimiento y liquidez y restricciones crediticias, lo que aumentó su riesgo comercial. La literatura internacional enfatiza que existe una relación entre el riesgo comercial y los honorarios de auditoría. Este estudio considera si existe una relación entre el tiempo (el período de tres años en que la recesión española fue mayor y el siguiente período de tres años) y los honorarios de auditoría. Analizamos los estados financieros y los honorarios anuales de auditoría, obtenidos de la base de datos SABI-Bureau Van Dijk, de 2008 a 2013, cobrados por auditores a 119 empresas manufactureras. Los resultados obtenidos, a pesar de las correlaciones positivas y negativas entre los honorarios de auditoría y otras variables de nuestro modelo, no son totalmente concluyentes ni consistentes. Señalan una relación tenue entre el tiempo y los honorarios de auditoría, corroborando parcialmente la realidad estadounidense, pero no los estudios realizados en Australia, China, Suecia y Corea del Sur.

Código JEL: M42

Palabras clave: Riesgo de auditoría; Riesgo del negocio; Honorarios de auditoría; Recesión de la economía; Periodo temporal

Introduction

The 2008 financial crisis had profound and negative effects in the majority of the countries on the gross domestic product, private employment, and retail sales, with inherent negative repercussions on most of the companies in the financial, industrial, commercial, and services sector.

This, inevitably, affected the profitability and the cash-flows of audited companies, which decided to renegotiate the existing contracts with their creditors, funders and suppliers of goods and services in order to share the crisis, by means of cost reductions in most of the productive factors, as confirmed by Cheffers, Whalen and Usvyatsky (2010), Ettredge, Li and Scholz (2007), Krishnan and Zhang (2014), Ettredge, Fuerherm and Li (2014) in their assessment on the pressure on auditors fees during the recession period.

The motivation for this research lies in the fundamental need to broaden the knowledge of Anglo-Saxon context-based studies (USA and Australia). These economies are characterized by the fact that companies mainly finance themselves through the capital market, and also by the strong audit supervision (PCAOB and SEC) that monitors the quality of the auditors' work (Goelzer, 2010; Kroeker, 2010).

In addition, empirical studies on the effects of the crisis on auditor's fees are scarce in Europe and nonexistent in Spain and other southern European countries. Spain in character-

ized as a country above the average size within the European Union, with a strong industrial sector, mainly financed by the banking sector. Furthermore, the study of the macroeconomic constraints on the auditors' fees in the Spanish industrial sector is important to understand the price strategies and how they adjust to external shocks and contrast the results obtained with studies carried out in the USA. The choice of Spain and its industrial sector is justified by the great impact that the international crisis had on the Spanish economy. Indeed, the crisis began in 2007 and from 2008 to 2010, Spain was one of the countries in Southern Europe that experienced one of the deepest recessions, when compared to the Eurozone average.

This study, apart from investigating the positive and negative factors which determine the fees, compares two crisis periods of the Spanish economy. The first one, considered to be its onset, from 2008 to 2010, characterized by a deep recession, measured in terms of GDP, performance, and default on payments; the second, from 2011 to 2013, is essentially the recovery of GDP in 2011, followed by a reduction in 2012 and 2013, but not as deep as in the previous three years, when the fall was deep and virulent.

The association between recession and auditors' fees is considered an important contribution to auditing theory and literature, due to the contrast it offers, is also one of the first studies to be carried out outside the USA, Australia and China. It also provides an economic explanation, based on the external environment, for the presumed pressure done by companies to reduce auditors' fees, according to an empirical study carried out in Europe, based on a sample of unquoted companies in the Spanish industrial sector

The study is also important for the following reasons: (1) It examines the effect of macroeconomic magnitudes on audit fees, a relevant aspect to understand the pricing strategies of audit companies, and how they adjust to antagonisms. Economic fluctuations, according to Abdel-Khalik (1990), cause profound changes in market condition, by relating binomial audit market and economic conditions. Different studies in the USA conclude that the recession reduces the demand for audit services and accelerates competition among industry firms. Maher, Tiessen, Colson and Broman (1992) show that the recessions in the 70's increase competition in the audit market and lead to a significant price reduction. The same occurred in 2008 and 2009 (Krishnan and Zhang, 2014); (2) In many European countries, empirical studies are scarce or nonexistent. The study carried out by Alexeyeva and Svanström (2015), referring only to the Swedish listed companies, admit that their impact was very smooth; (3) The study analyzes the level of the auditors' fees practiced in the Spanish industrial sector in two successive financial crisis periods; (4) By analyzing the relationship between audit fees and macroeconomic variables we provide investors and regulators with a better understanding of the impact of the recession on audit fees, which is likely to encourage more active supervision.

The margin contribution to the theme is part of the additional research proposed by Ettredge, Fuerherm and Li (2014), Krishnan and Zhang (2014), in order to study the periods

after 2008, and, more specifically, the industrial sectors, acknowledging in advance the thesis that suggests that the auditors maintain the same level of carefulness (Pong and Whittington, 1994; Coram and Woodliff, 2004; Ettredge, Bedard, & Johnstone, 2008).

The research is organized as follows. In section 2, we focus on the effects of Spanish financial crisis and how it affects auditors' fees. In section 3, we present the literature review. Section 4 indicates the research methodology. In section 5, we present empirical results and robustness tests. Section 6 sets forth our conclusion, study limitations and final remarks.

Institutional background

An economy downturn can be determined using a wide range of indicators. A country faces economy recession when the gross domestic product (GDP) reduces in two consecutive quarters. Economy downturn is also measured by the unemployment rate and loan defaults. All of these indicators were present in the Spanish downturn.

Until 2007, the Spanish economy met a long period of economy expansion, based in domestic demand, construction and property development and credit expansion (Carballo-Cruz, 2011). But the international crisis, that began in 2007, had its impact in the Spanish economy. Economy begun to slowdown in 2007 and Spain went into recession in 2008 Q2 until 2010 Q1, seven consecutive recession periods, a recession far more stretched since the usual is three to four quarters. "The hardest stage of the crisis, in terms of product breakdown and job destruction, coincided with the first quarter of 2009, when GDP fell 6.3% and unemployment increased by around 800.000 people." (Carballo-Cruz, 2011, p. 310).

The unemployment rate grew from 8.3%, in 2007, to 20.1% in 2010. The unemployment rate was especially high among young workers, under-qualified employees and foreigners; there was also a substantial rise in long-term unemployment.

By 2009, national demand had fallen by 8%, while in the Eurozone merely fell 1.6%. Private consumption, investment in equipment, investment in construction fell, 5%, 29% and 18% respectively. Imports also fell sharply – 20% and exports fell 11%. "On the supply side, the most significant fall was in added value in industry (15pp) and construction (9pp), whereas this variable hardly fell in services, as non-market services offset the 4pp fall in market services" (Ortega and Penalosa, 2012).

After 2010 Q1, the Spanish GDP began to recover, going through a slightly, but positive, growth until the end of 2011. Despite the fact that the GDP ceased to fall, national demand continued adjusting downwards. Nevertheless, exports faced a strong momentum and imports were contained. However, from 2012 to 2013, the economy started to contract once again, showing a negative GDP growth of 1.6% in 2012 and 1.2 in 2013.

From 2011 to 2013, the unemployment rate increased 22% in 2011 to 26.1% in 2013. The

domestic demand contracted from -2.0% in 2011 to -2.7% in 2013 and the exports, although positive, faced a slowdown from 7.9% in 2011 to 4.9% in 2013 (OECD, 2014).

The huge stock of real estate assets owned by banks produced losses in their financial statements, either by default or by asset depreciation. This situation was the basic pillar of the solvency problems that affected the Spanish banking system, mainly the *Cajas de Ahorros*, whose weight in the financial sector was close to 50%. By July 2012, the Spanish government sealed, with the Eurogroup, a financial envelope, up to €100 billion to assist bank capital shortfalls. Despite this huge pillow, the Spanish government did not require the full amount, as the European Stability Mechanism disbursed € 39.5 billion, in December 2012, and another € 1.8 billion, on February 2013.

Finally, the Spanish newspaper *Expansión* of 24/09/2009 says, based on data from the *Boletín Oficial del Instituto de Contabilidad y Auditoría de Cuentas (ICAC)*, that the statutory auditors forecasted closing the year 2008 with a decrease in fees, admitting, however, a compensation with a rise in the tax and legal consultancy and other work related to new problems induced by the financial crisis, designated by Firth (2002) as “other specific corporate events”. The newspaper refers that the traditional auditing business is going through one of its darker moments in Spain, due to the price war that started to develop after Arthur Andersen’s bankruptcy.

The relation between audit fees and financial recession is still an under-research issue. In fact, the evidence is neither totally consistent nor convincing as they present mixed tendencies, which can be seen in the narratives related to the impact of the crisis on the auditing companies (Whitehouse, 2010; *Accounting Today*, 2009; *Expansión*, 2009). Ettredge, Fuerherm and Li (2014), Krishnan and Zhang (2014) suggest further research to confirm the results obtained in the USA, in relation to the pressure exerted on the auditors’ fees by the companies after 2008. In addition, they recommend the research to be focused on non-financial sectors, namely, the industrial sector.

Whitehouse (2010) suggests additional explanations for the decline of auditors’ fees in the USA, based on: loyalty reasons, on the progress made in internal control systems (SCI), and the implementation of the *Sarbanes-Oxley Act*. These facts will reduce the substantives tests made by auditors, so fewer hours will be spent.

Accounting Today (2009) provides some data on the impact of the financial crisis on the auditing companies, stating that the majority of the audited companies were: about to close or on the verge of declaring bankruptcy; intending to reduce their business plans, expecting to dismissing personnel, or intended to reduce salaries.

In a recession environment, the possibility of error in the financial statements of the companies is greater. Consequently, higher auditing risks require modifying the procedures in order to obtain more solid evidence (PCAOB, 2008): so, a greater auditing effort inevitably requires higher fees. In fact, in a crisis environment there is a higher probability that the auditor suffers a loss due to the relationship established with the client, and it is therefore expected that the

fees are adjusted to the perception of the risk, including a premium, when, comparatively to stable economic periods, the risk of occurring irregularities, frauds and errors is higher.

Thus, the models on which the determination of the price of an audit are based (Simunic, 1980; Simunic and Stein, 1996; Johnstone, 2000; Markelevich and Rosner, 2013), suggest that the price in a competitive market is determined depending on the auditing effort (number of working hours), plus a risk premium.

Yet, the evidence related to the existence of a risk premium is insufficient and confusing (Niemi, 2002), in as much as the factors that influence the level of risk of a business must be evaluated under a systematic, and not Cartesian, perspective, since it is not related to only one factor (Brumfield, Elliott and Jacobson, 1983), and hence the difficulty in evaluating the risk of a business in relation to each particular client.

This way, Simunic's model (1980), although theoretically correct, is not used in practice. In fact, auditors recognize the existence of a strong competition, which hinders the adjustment of the fees, however, Wallace (1989), Simunic and Stein (1996), Bell, Landsman and Shackelford (2001) did not find evidence that supports the existence of a risk premium. Hence, the model may work in an oligopolistic market (Big 4), but will not be extended to small and medium size companies, since there are significant differences between these two markets.

The above studies do not provide clear evidence of the potential impact of the financial crisis on auditors' fees. There is, in fact, scanty research on this issue, from which it has been deduced that the international literature has paid little attention to the virtual impact of the financial crisis on audit fees and its impact on audit quality and auditor independence.

Literature review

Auditors have the responsibility to issue an opinion about the fairness presentation of financial statements; therefore, they collect evidence regarding management assertions to support their opinion. In every audit engagement auditors face audit risk, the possibility that the auditors may unknowingly fail to appropriately modify their opinion on financial statements that are materially misstated. Audit risk arises from auditors' poor performance and/or from business risk.

In addition to the power of the negotiation parties, audit fees are also defined by the client's operations complexity, size, auditor litigation risk and audit risk (Francis and Simon, 1987).

Auditors receive a fee to attest the assertions, reflected in the financial statements, and to give an opinion regarding the fairness presentation of the financial statements. It is assumed that audit fees reflect the work the auditor has to undertake to reduce audit risk to an acceptable level.

Business risk can be divided into client business risk and auditor business risk. Client business risk is the risk that the client's economic condition will deteriorate in either short or long term. Auditor business risk can be defined as the probability that an auditor will suffer

loss due to a relationship with a client. Auditor business risk arises from litigation directly associated with the client's size, stock price performance and financial condition.

The client business risk can be evaluated in various ways. First of all, the economic environment – expansion or recession – can have a tremendous effect on the ability to continue operating, on the profitability and on the operations; competitors' actions – reducing prices or opening new lines of products can also affect clients business risk; technology, complexity of financial instruments and transactions, geographic locations of suppliers, clients, and the company branches are also elements to take into consideration when assessing this type of risk.

In the period of economic recession, in addition to questioning the quality and role of auditing in society, the high level of auditors' fees is also called into question (Sikka, 2009). In fact, the research carried out by Krishnan and Zhang (2014), the studies of Xu, Carson, Fargher and Jiang (2013), the works of Zhang and Huang (2013), Sonu, Ahn and Choi (2017) and the analyzes of Alexeyeva and Svanström (2015), respectively on the realities of the United States, Australia, China, Korea, and Sweden, regarding auditors' fees, in a liberal regulatory environment, do not show consistent results, and are even contradictory. Indeed, with regard to Australia, China and Sweden, the evidence presented points to the fact that despite the financial crisis, there was an increase in audit fees, whereas in the USA and Korea, the reality is the opposite.

In turn, Brumfield, Elliott and Jacobson (1983) suggested that one way for auditors to respond to business risk is to charge fees taking that risk into consideration. The study by Simunic (1980) suggests that audit fees are a function of the auditor's effort and also client business risk. Despite mix results relating audit fees with business risk, some empirical studies support that auditors charge higher fees when the business risk is higher (Morgan and Stocken, 1998; Bell, Landsman and Shackelford, 2001; Niemi, 2002; Peel and Roberts, 2008).

Client business risk is closely related to its financial condition. Pratt and Stice (1994) demonstrate that as the client financial condition declines the risk of litigation against the auditor rises. Auditors respond to an increase in litigation risk by issuing modified opinions (Krishnan and Krishnan, 1996), becoming selective in the acceptance of engagements, resigning from engagements with high level of business risk (Brumfield, Elliott and Jacobson, 1983) and by adjusting audit fees to cover potential losses from litigation (Pratt and Stice, 1994). So, auditor business risk is assumed to have a positive impact on audit fees (Brinn, Peel and Roberts, 1994; Moizer and Hansford-Smith, 1998). Peel and Roberts (2003) conducted a study regarding the determinations of audit fees and reached the conclusion that auditors charge higher fees to companies that represent a higher risk of failure, as a compensation for higher audit risk.

As pointed out by Bell, Landsman and Shackelford (2001), in a competitive equilibrium, audit fees should reflect the expected costs of the auditor's business risk.

During a financial crisis, companies face a liquidity problem, since banks dramatically restrain loans to borrowers due to the run by short-term bank creditors, leaving companies with

liquidity problems (Ivashina and Scharfsteinb, 2010), and increasing their business risk. Also, firms tend to plan deeper cuts in their expenses (Campello, Graham and Harvey, 2010), which has a negative effect on auditors' fees.

As the demand for audit is determined in terms of agency theory (Chow, 1982; Watts and Zimmerman, 1983; Jensen and Meckling 1976) and given that in small and medium-size companies the proportion of equity is mostly owned by the owners themselves and not by external shareholders, the explanation for audit demand, based on the above theory, would no longer be significant (Keasey and Watson, 1991).

However, Tauringana and Clarke (2000) and Seow (2001) found that in the UK there is an inverse relationship between the existence of proprietary managers and demand for audit, which means that, in general, the shareholder structure does not run the company. The second author also suggests that the dispersion should be measured by the existence of a number of non-shareholder directors, which seems to reflect the English reality.

In addition, the French model (Piot, 2001) differs from the English one, and it is not clear that agency costs can fully explain the demand for audit in the context of French small and medium-size companies. Therefore, costs, in this type of company, seem to be more related to the existence of non-owner managers in conflict with the shareholders, and less with the conflict between the majority and minority shareholders.

However, debt agency costs have explanatory power for the demand for audit, depending on the wealth transparency capacity of creditors to owners, and these costs increase as companies are more in debt (Black and Scholes, 1973; Chow, 1982; Defond, 1992; Francis and Wilson, 1982).

Thus, Keasey and Watson (1991) concluded that it is expected that debt theory is more significant to generate audits than agency theory, and thus, creditors may require that companies with certain debt ratios must be audited (Chow, 1982). While the importance of agency theory in the context of small and medium-size companies is neither conclusive nor clear, debt agency costs seem to be more important than agency costs. However, Dedman, Kausar and Lennox (2014) suggest, based on evidence from the UK, that the likelihood of requesting voluntary audits is greater in companies with higher agency costs.

The studies carried out by Simunic (1980) and Pong and Whittington (1994) were pioneers in the attempt to model audit fees. The first one suggests that audit fees differences are a result of the following variables: complexity and risk of the audited company and the auditors' quality; and the second, suggests that the offer is commanded by a cost function, based on the amount of work done.

These theories explain fee variations in large companies, and were enriched by the research by Peel and Roberts (2003), focusing on small and medium-size audits to micro and medium-size entities in the English industrial sector. In their study, they concluded that, although the market is highly competitive, some companies were willing to undergo an allegedly higher

quality audit, and pay a premium in order to benefit from an association with one of the Big 4.

However, as admitted by Pong and Whittington (1994), an audit level is established by statutory and professional regulations, in consequence companies may not be willing to pay for work beyond the minimum limits. It is therefore assumed that it is difficult to justify the extension of the audit work to investors which, consequently, limits their value.

A more important meaning of agency costs has to do with the desired level of audit quality. Thus, companies, faced with high agency costs, may request and pay for an allegedly higher audit quality (Defond, 1992; Piot, 2001).

An attribute that is difficult to verify at the time of the purchase decision, so the reputation of the service provided and the existing relationships with the supplier are potentially significant in the decision and the amount of fees payable (Shapiro, 1983; Dasgupta, 2000).

This situation is taken into consideration by the audit firms when they develop a differentiation strategy, reflected by an extra premium (Teoh and Wong, 1993). However, small and medium-size companies, based on the thinking of Pong and Whittington (1994), may not appoint the most prestigious auditors if the costs outweigh the benefits.

In an alternative hypothesis, in competitive markets, the largest audit companies benefit from economies of scale and, thus, charge lower fees. Francis (1984) suggests that lower fees, based on economies of scale, are practiced by large auditing companies for large audited companies.

There is evidence of differentiation in smaller markets (Peel and Roberts, 2003), however, in general terms, when in the presence of small audits we are faced with a very competitive market (Simunic, 1980; Francis, 1984; Lee, 1993; Peel and Roberts, 2003), where audits are publicly negotiated (Peel, 1997), which enables small and medium-size companies to have greater choice of auditor. In fact, in this market, when audits are requested from multinationals, the payment of a premium for differentiation of the product is due.

Pratt and Stice (1994) have also found evidence that auditors' fees reflect an additional premium to cover the risk of litigation. In their turn, Houston, Peters and Pratt (1999) suggest that auditors' fees include a risk premium when it is considered high by the auditors, and Johnstone and Bedard (2001) suggest that proposed fees include planned audit hours and a premium for fraud and relevant errors. Other studies (Wallace, 1989; Simunic and Stein, 1996; Bell, Landsman and Shackelford, 2001) did not find evidence to justify the existence of a risk premium.

Niemi (2002) suggests that setting fees according to the risk profile of the client is rational, but there are practical difficulties in assessing the level of client risk with reliability. However, Bell, Landsman and Shackelford (2001) suggest that auditors increase the number of audit hours, but not fees, when working in a high-risk environment, which is consistent with the interpretation of the existence of a positive relation between business risk and the audit fees. They conclude that multinational audit firms state that there is little or non-existent correspondence between business risk and fees charged. The rationale is based on the idea

that business risk cannot be measured, and therefore cannot be reflected in fees. According to Gietzmann and Pettinicchio (2014), the research related to fee adjustments depending on audit risk is still at an early stage due to a lack of public information.

More recently, Malhotra, Poteau and Russel (2015) and Moutinho et al. (2012) point out that there is a link between audit fees and low levels of corporate governance. This link between firm performance shows that audit fees are consistent with the notion that when the auditor perceives this situation raises the fees. In their turn, Corbella et al. (2015) investigate the triangle in Italy – audit rotation, audit fees and audit quality – while Minutti-Meza (2014) analyzes audit fees to determine whether they respond to client risk, auditor experience and work, competitive market pressures and independence between auditors and audited companies. Also, Badertscher et al. (2014) study the link between litigation risk and audit fees.

More specifically, Krishnan and Zhang (2014) have analyzed, as a consequence of the financial crisis of 2008, the relationship between the reduction of audit fees and the quality of financial reporting of banks, audited or not by the Big 4, using the recognition of abnormal impairments for credit losses in result management. According to these researchers, fee reductions are associated with the increase in those impairments and a corresponding reduction in bank earnings. They have also concluded that the cut in audit fees is more common in banks audited by the Big 4, than in banks audited by other companies. In their turn, Ettredge, Fuerherm and Li (2014) investigated the pressure for lowering fees in the US in the non-financial sector from 2007 to 2009 (a period in which audit risks increased due to the reduction in profitability and the potential increase in impairments) and concluded that the association between pressure on fees and reduction of audit quality is restricted to this period and positively associated with errors made by customers, slightly significant in 2006 and greatly significant in 2008, which presupposes a lower audit quality in the recession period in response to the pressure in reducing fees.

Thus, the pressure on audit fees has come under the radar of concerns of the US regulators (the Public Company Accounting Oversight Board (PCAOB) and the Securities and Exchange Commission – SEC). As a result, the reductions in the cost of audits were investigated by the PCAOB (2010), a body that showed evidence that pressure on fees affected the rigor of audits. At the same time, the SEC, according to Kroeker (2010), recommended that the auditors' behavior, in response to pressure, should not be of limiting audit work. As it happens, an economic environment in recession strengthens the tendency of less ethical behavior of those in charge of company management, leading to the increase of intentional and unintentional errors, which also leads to an increase of the risk for the client and of the audit. This situation is in line with the foundations of the agency theory (Chow, 1982; Watts and Zimmerman, 1983; Jensen and Meckling, 1976), and therefore requires a deepening of audit testing.

In case of pressure on auditors' fees in recession times, the additional effort, in order to ensure a satisfactory low audit risk, is likely to be compromised. In fact, when auditors are required to reduce their margin, a situation that virtually weakens the allocation of resources to a greater auditing effort is created. This has been proven by the US regulator (PCAOB, 2008), that identified non-conformities with the auditing standards in areas most significantly affected by the economic recession. Some auditors, faced with the pressure to reduce their fees, reduced the length of auditing procedures to save on costs (PCAOB, 2010), therefore also reducing their quality.

However, Coram and Woodliff (2004), Ettredge, Bedard and Johnstone (2008) suggest that auditors try not to reduce the audit effort in response to the pressure to reduce fees, mainly because of reputational risk and the fear of sanctions imposed by regulators, and the possibility to be sued and to be required to pay compensation to third parties.

Methodology

Financial crisis presents a dilemma to audit fees. On the one hand, companies need to reduce costs, which may result in lower fees. On the other hand, during financial crisis companies tend to have a great business risk, and therefore audit fees tend to increase. Since financial crisis has a contradictory effect on audit fees, this poses a research problem, since there is no significant relation between audit fees and financial crisis.

The sample is obtained from SABI database for the years 2008 to 2013. The initial data, which consists of 449 manufacture unlisted companies (NAICS primary code 31, 32, 33), is scrutinized missing variables. The sample is reduced to 119 companies, which represents 27% of the initial list. Firms that suffer from financial constraint during financial crises tend to be smaller and private (Campello, Graham and Harvey, 2010), hence our decision to analyze unlisted companies. Furthermore, as reported by Stein, Simunic and O'Keefe (1994), auditors spend more hours when they audit industrial companies than when they audit companies in the financial sector. For the companies studied, the following control variables were used:

Table 1
Control and Dummy Variables

Variables	Dimension	Financial situation	Other characteristics
Total assets (SIZE)		Current assets minus the inventory to current liabilities (QUICK)	Big 4 (BIG4)
Receivables divided by total assets (REC)		Earnings before interest rate and tax divided by total assets (ROA)	Legal form (LFORM)
Current assets by total assets (CATA)		Current year loss (LOSS)	Time (TIME)
Number of geographic segments (GEO)		Long-term debt to total assets (LEV)	
Inventory divided by total assets (INV)			

Following previous studies on auditors' fees, we expect that these are affected by client size firm, complexity and risk (Carcello et al., 2002; Ashbaugh, LaFond and Mayhew, 2003; Barkness and Simnett, 1994; Palmrose, 1986).

The audit fee (*Laf*) model is used as a dependent variable, while the independent variables considered were audit complexity and a client's financial condition (Simunic, 1980; Seetharaman, Gul and Lynn, 2002; Francis, Reichelt and Wang, 2005; Hay, 2011; Carson, Simnett, Soo and Wright, 2012; Cairney and Stewart, 2015; Wang and Chui, 2015).

Time is our test variable, 1 for the first three years of the crisis (2008 to 2010) and 0 for next three years (2011 to 2013). We assume that there are differences between audit fees charged in the first period and audit fees charged in the second period, since we take into consideration that the financial crisis did not immediately reflect on audit fees, instead there was a time lapse since the beginning of the crisis and its effects on audit fees. Based on the studies carried out by Gul, Srinidhi and Shieh (2001) and Hye Seung, Xu Li and Heibatollah (2015), a positive coefficient of time (TIME) is expected.

The variable audit complexity includes total assets (SIZE), inventory divided by total assets (INV), receivables divided by total assets (REC), current assets by total assets (CATA), and number of geographic segments (GEO), these ratios are expected to be positively correlated with audit fees, as demonstrated in prior investigations by Barkness and Simnett (1994) and Palmrose (1986).

A client's financial condition can be measured by the ratio of current assets minus the inventory to current liabilities (QUICK), earnings before interest rate and tax divided by total assets (ROA), these two ratios are expected to be negatively related to audit fees, current year loss (LOSS) and long-term debt to total assets (LEV), are expected to be positively related to audit fees, based on Niemi (2002), Whisenant, Sankaraguruswamy and Raghunandan (2003) studies.

We also included a couple of dummy variables as control variables. The dummy variable BIG4, equals 1 if the auditor is Deloitte, Ernst and Young, KPMG and PriceWaterhouseCoopers-PwC, and 0 otherwise. Previous studies refer a premium for Big 4 audit fees (Carson, Simnett, Soo, and Wright, 2012), so we expect the BIG4 coefficient to be positive. The dummy variable legal form (LFORM) equals 1 if the society is a public limited company or 0 if it is a limited company. Since limited companies are, in most cases, small structures, mainly with a reduced number of equity holders, we expect the fees charged by auditors to be smaller to these firms when compared to the ones charged to public limited companies.

Therefore, taking into account the previous international literature, we consider the following hypothesis:

Hypothesis 1: Variables SIZE, INV, REC, CATA, QUICK, ROA, LOSS and LEV constitute the determinants of audit fees.

Hypothesis 2: SIZE, INV, REC, CATA, LOSS, LEV and BIG4 are expected to be positively correlated with audit fees while QUICK and ROA are expected to be negatively related to audit fees.

Another issue was to see whether there are differences between the periods 2008-2010 and 2011-2013:

Hypothesis 3: There is a difference in audit fees in different time periods.

To analyze the hypotheses, we consider the regression model analysis which generates an equation to describe the statistical relationship between one or more predictor variables and the response variable. Regression coefficients represent, if statistically significant, the mean change in the dependent variable for one unit of change in the predictor variable while holding other predictors in the constant model (StatSoft, Inc. 2013. *Electronic Statistics Textbook*. Tulsa, OK: StatSoft. WEB: <http://www.statsoft.com/textbook/>). We considered panel data (or cross-sectional time series data) which allowed us to measure differences in companies over time. This can be incorporated in a regression model considering random effects model. Panel studies are essentially equivalent to longitudinal studies, although there may be many response variables observed at each point in time. The equation to depict our regression model is:

$$Lafijt = \alpha_0 + \beta_1 Timeijt + \beta_2 Sizeijt + \beta_3 Invijt + \beta_4 RECijt + \beta_5 CATAijt + \beta_6 Geoijt + \beta_7 Quickijt + \beta_8 ROAijt + \beta_9 Lossijt + \beta_{10} Levijt + \beta_{11} Big\ 4ijt + \beta_{12} Lformijt$$

Results

Table 2 provides detailed sample information related to descriptive statistics year by year.

Table 2

Mean and standard deviation of variables given in th EUR * given in %

2013		Years						
		2012	2011	2010	2009	2008		
AF	Mean	18.083	19.158	19.414	19.321	18.744	19.152	
	Std dev	15.376	16.562	16.331	16.807	15.036	17.038	
SIZE	Mean	57198.418	54921.412	56029.212	56056.892	45667.534	46385.587	
	Std dev	222275.063	210947.768	218671.5	224337.2	145698.5	157752.8	
INV	Mean	0.183	0.185	0.185	0.167	0.163	0.172	
	Std dev	0.129	0.135	0.142	0.129	0.130	0.135	
REC	Mean	0.295	0.277	0.291	0.293	0.300	0.307	
	Std dev	0.179	0.168	0.166	0.163	0.173	0.166	
CATA	Mean	0.616	0.615	0.615	0.608	0.604	0.624	
	Std dev	0.217	0.223	0.225	0.233	0.224	0.219	
QUICK*	Mean	1.543	1.623	1.582	1.488	1.479	1.516	
	Std dev	2.284	2.772	2.978	2.242	2.205	2.666	
ROA*	Mean	2.033	-1.152	0.867	-0.530	-0.442	2.719	
	Std dev	10.666	27.095	26.216	50.628	14.870	11.183	
LOSS	Mean	937.765	1840.479	755.975	188.681	860.739	706.294	
	Std dev	8358.939	10921.954	6724.682	7924.904	7034.976	7241.119	
LEV	Mean	61.097	61.421	58.624	63.649	64.683	60.622	
	Std dev	44.242	56.734	44.916	59.305	51.629	46.522	

This shows that average audit fees, comparing 2008 with 2013, decreased; while in 2008 it was 19,152 in 2013 it was 18.083. The variables SIZE, INV, QUICK, LOSS and LEV show a mean increase, while REC, CATA and ROA decreased. Table 2 shows quite consistent values over time; only the variable LOSS presents a change over time.

The analysis by segment, form and audit is expressed in table 3.

Table 3

Number of companies related with geographic segments, legal form and audit by a Big4 company

Variable		N	%
Geo	0	59	49.6%
	1	60	50.4%
Form	Public Limited	78	65.5%
	Limited	41	34.5%
Big 4	0	76	63.9%
	1	43	36.1%

Source: Self-elaboration

It shows that Big 4 client's compromise 36% (43 clients) and non-Big 4 clients represent 64% (76 clients) of the sample. As for the companies, 66% are *public limited companies* (78 clients) and 34% are *limited companies* (41 clients). The number of companies that have geographic segments and the ones that do not are almost equal (60 companies have geographic segments and 59 do not have geographic segments).

Diagnostic tests were performed to assess the assumptions of the methodology Durbin Watson is 2,3, VIF values are around 1 and residual diagnostic plots are within the assumptions.

The factors determining the fees and the time elapsed are represented in table 4.

Table 4

Regression model

Variable	B	Std error	95% Confidence Interval		Wald	p-value	
intercept	27,030	2,1376	22,841	31,220	159,894	<0,001	VIF
Size	2,481E-05	4,2951E-06	1,639E-05	3,323E-05	33,374	<.0001	1,131
inv	-1,653	3,6169	-8,743	5,436	,209	,648	1,416
REC	11,459	4,1907	3,245	19,673	7,477	,006	1,797
CATA	-3,917	3,1628	-10,116	2,282	1,534	,216	2,044
Quick	,127	,0826	-,035	,289	2,369	,124	1,240
ROA	-,026	,0137	-,053	,000	3,734	,053	1,045
Loss	-4,82903E-05	4,2662E-05	,000	3,533E-05	1,281	,258	1,054
Lev	,018	,0099	-,002	,037	3,258	,071	1,029
Big4	18,450	1,1324	-20,670	-16,231	265,455	<.0001	1,187

Form	1,045	,9412	-,800	2,889	1,232	,267	1,027
Geo	-,456	,8718	-2,164	1,253	,273	,601	1,052
Time	,110	,8882	-1,631	1,851	,015	,901	

It shows a significant effect ($\alpha=0.05$) on SIZE, i.e., for each th EUR increases in SIZE, there is about a 2.481E-05 th EUR increase in audit fees. There is also a significant effect of REC, for each th EUR increase in REC there is approximately an 11.459% increase in audit fees. At a level of $\alpha=0.1$ there is a significant effect of ROA and LEV, for each th EUR increase in ROA there is about a 0.026 decrease in audit fees, and for each th EUR increase in Lev there is about a 0.018 increase in audit fees. The final interpretation of these results indicates that there is a significant effect on the audit company if it is one of the BIG4, i.e., being audited by a Big 4 increases the audit fee by 18.45. These results are valid when controlled by all the other variables. Finally, there is no significant time (year) effect when controlled by other variables.

In conclusion, variables SIZE, REC, ROA, LEV and BIG4 are determinant in audit fees, SIZE, LEV, REC and BIG4 have a positive effect while ROA has a negative effect. Time periods do not have an effect on audit fees, which allows us to sustain the assumptions previously made.

Table 5 summarizes the hypotheses and the conclusions.

Table 5
Summary of hypothesis

N°	Hypothesis	Accept/Reject
H1	Variables SIZE, INV, REC, CATA, QUICK, ROA, LOSS and LEV constitute the determinants of audit fees.	Partial Accepted
H2	Size, Inv, REC, CATA, Loss, Lev and Big4 are expected to be positively correlated with audit fees while Quick and ROA are expected to be negatively related to audit fees.	Partial Accepted
H3	There is a difference in audit fees in different time periods	Rejected

Conclusions

The purpose of this study is to examine the possible relationship between the economic crisis that began in 2008 and the likelihood of pressure from audited companies to reduce the fees perceived by auditors. These studies have been conducted almost exclusively in Anglo-Saxon countries, particularly in the USA and Australia, and focus mostly on the financial sector and provide mixed results. Therefore, the authors (Krishnan and Zhang, 2014; Ettredge, Bedard and Johnstone, 2008; Ettredge, Fuerherm and Li, 2014; Peel and Roberts, 2003) recommend further research on the subject in order to contrast the results obtained, which would provide

a significant marginal contribution. Investigations of Xu, Carson, Fargher and Jiang (2013), Zhang and Huang (2013) and Alexeyeva and Svanström (2015) studies were circumscribed to listed companies, but not specifically direct to the manufacture industry.

In periods of recession, the main economic and financial indicators are generally negatively affected, reflecting low levels of profitability and a clear reduction in the cash flow generated. Thus, the problems caused by the financial crisis, underpinning the theory of the agency, can motivate the agents involved in the accountability process to make intentional and unintentional errors, which affect the financial statements presented by the companies. In this scenario, the client and audit risk increase. Thus, a recessive economic environment favors the possibility of errors in the financial statements. In this context, auditors' fees are subject to two types of conflicting pressure: an upward pressure, generated by the perception of a greater audit risk, and a downward pressure, compelled by audited companies to reduce fees.

In the United States, there is evidence of downward pressure on auditors' fees, however, in the European Union, which has a legal and institutional framework for auditing, there is only one study whose results point out that there is no pressure regarding audit fees (Alexeyeva and Svanström, 2015). This situation was considered limiting by Krishnan and Zhang (2014) and Ettredge, Fuerherm and Li (2014), who recommend additional studies in different countries and in sectors that are not exclusively financial. Our marginal contribution to the literature lies precisely in filling this gap by presenting evidence from a European country – Spain - obtained from the industrial sector during two consecutive periods of economic crisis.

Our hypotheses are developed, substantiated and supported in previous research and seek to study the positive and negative factors determining the fees (H1 and H2) and examine two periods of the financial crisis in order to find out whether the Spanish economic crisis had a decisive influence on auditors' fees (H3).

This study addresses the following main research questions: (i) Has the financial crisis lead to a reduction on audit fees charged to Spanish manufacturing companies? (ii) What are the variables are positively and negatively related to audit fees? (iii) What variables are determinant to audit fees? and (iv) Was there a time lapse between the beginning of the financial crisis and its reflection on audit fees?

The descriptive statistics results show that, in absolute values, there was a decrease in audit fees from 2008 to 2013. The findings are consistent with the study by Krishnan & Zhang (2014), that point out to a reduction in audit fees during the financial crisis, and also Campelo, Graham and Harvey (2010), who concluded that during a recession period companies tend to plan deeper cuts in their expenses affecting negatively auditors' fees.

The variables that have the most influence on audit fees are SIZE, REC, LEV, Big-4 and ROA. The last one has a negative effect on audit fees while the first ones have a positive effect. This

partially confirms the conclusions of Barkness and Simmet (1994), Palmorose (1986), Niemi (2002) and Whisenant, Sankaraguruswamy and Raghunandam (2003), since our study didn't found any significant influence of INV, CATA, GEO, QUICK, ROA or LOSS on audit fees.

Regarding the two dummy variables, Big 4 and LFORM, our study shows that the first one has a positive impact on audit fees, which confirms the previous study of Carson, Simmett, Soo and Wright (2012), while the legal form has no effect on audit fees.

Concerning our last question, contrary to our first assumption, that the variable TIME would be expected to have a significant effect on audit fees (Gul, Srinidhi and Shieh, 2001; Hye, Xu Li and Heibatollah, 2015), we found that this variable has no effect on audit fees.

The development of the analysis supports each of the initially hypotheses formulated. The variables SIZE, REC, QUICK and LEV, measured through the mean, show a positive correlation with the auditors' fees, while the variables INV, CATA, LOSS and ROA show a decreasing mean and prove a negative correlation. TIME, despite, positive and negative correlations, between audit fees and other variables of our model, provides a mixed analysis, insofar as, during the period considered, the average fees decreased, even if slightly, in 2009, 2012 and 2013, and increased in the remaining years. This trend partially confirms the studies carried out in the American context, but not in Australia, Sweden and China.

The results point to a partial confirmation, which may be sustained if supported by the institutional framework of the audit, the audit market, the type of audited companies and the auditors' groups themselves. From the population analyzed, only the manufacture unlisted companies can be considered a limitation to our work.

This research has several empirical contributions which could be of interest for both academics and regulators. It contributes to fill the gap in research about the impact of the financial crisis in audit fees of non-listed companies.

Further studies could be directed to the analysis of other Spanish economic sectors, and for periods of time after 2014, in order to monitor the trends that occurred after 2013.

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