

# Impact of the Global Financial Crisis and Resulting Bail-In on the Audit of Cypriot Banks

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## Abstract

*This study aims to examine the impact of global financial crisis and the resulting bail-in on audit fees of Cypriot banks as a result of increased audit risks. It is investigated by examining audit fees charged to Cypriot banks during three sample periods: Pre-global financial crisis (2000-2007), post global financial crisis (2008-2012) and during bail-in period (2013-2015). This study includes a quantitative research design, including an audit fee regression model to examine the impact of global financial crisis and resulting bail-in on audit fees. The results reveal that auditors charged higher audit fees after the crisis period compared to pre-crisis period and a larger and more significant increase in audit fees continued during the bail-in period. This study also provides additional test carried out on controlling the connection of Cypriot banks with Greece and supplementary tests on the robustness of the model.*

**Keywords:** pre-global financial crisis, post-global financial crisis, bail-in, audit fees, Cypriot banks

## 1. Introduction

### 1.1 Background

The global financial crisis of 2008-2009 is deeper and wider than any previous one, reflecting the growth in financial penetration and globalization in contrast to previous crises.<sup>3</sup> It is considered to be the most severe since the Great Depression.<sup>4</sup>

The global financial crisis emerged from the credit crisis, which resulted from the debacle of the U.S. housing market. The background of the problem is complex, but one of the primary factors that stipulated the economic downturn was the intro-

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<sup>3</sup> M. Clerides and C. Stephanou. 'The Financial Crisis and the Banking System in Cyprus' (2009) 3(1) *Cyprus Economic Policy Review* 27-50.

<sup>4</sup> H.H. Friedman and L.W. Friedman *The Global Financial Crisis of 2008: What Went Wrong?* (2009) SSRN eLibrary, available at <http://ssrn.com/abstract=1356193>.

duction of sub-prime mortgages that targeted people with lower credit and savings and made house ownership more affordable. Simultaneously, financial innovation led to the growth of Collateralised Debt Obligations (CDOs), which consisted of tranches and these tranches were sold to interested investors. Pooled assets such as mortgages, bonds, and loans were served as collateral for CDOs. Financial innovation also led to the introduction of another highly complex financial instrument, namely Credit Default Swap (over-the-counter derivative), which was making a CDO tranche much safer as it was insurance for it. Rating agencies put AAA ratings on these CDOs that made them highly desirable to foreign investors and pension funds. Therefore, the substantial securitisation with highly complex financial products has spread asset-backed securities related to U.S. home loans globally.

The bursting of the U.S. housing bubble resulted in enormous losses to both homeowners and financial institutions. This affected many groups including mortgage lenders, investment banks (e.g. Lehman Brothers), foreign investors, and insurance companies (e.g. AIG). Homeowners started defaulting on their loans and investment banks started selling the houses leading to a dramatic fall in the U.S. real estate valuations. The failure of the U.S. housing market also resulted in the damage to the global financial environment and eventually to the recession of the global economy.<sup>5</sup> The economic downturn had a negative impact on the global financial market and financial stability, triggering a negative chain reaction that has caused the collapse of stock markets at a global level. Thus, the confidence of investors in the financial system had been lost. Consequently, this led to many macroeconomic problems including the dramatic fall of global GDP, the significant decrease in international trade globally, and the decline of global wealth on the whole.

The bank risk during the financial crisis was the largest since the Great Depression. The decimation of banking shares' market values during this period was unprecedented as the market capitalisation of banks in Europe and the U.S. was decreased by 82%.<sup>6</sup> Problems in the banking sector resulted in an extremely severe impact on the real economy and to high levels of unemployment mainly in European countries such as Ireland, Portugal, Spain, Greece, and Cyprus.

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<sup>5</sup> P. Österholm 'The Effect on the Swedish Real Economy of the Financial Crisis' (2010) 20(4) *Applied Financial Economics* 265–274.

<sup>6</sup> Y. Altunbas, M. Simone, and M.I. David 'Bank Risk During the Financial Crisis: Do Business Models Matter?' (2011) *ECB Working Paper No. 1394*, SSRN eLibrary, available at <http://ssrn.com/abstract=1945143>.

During the financial crisis, a number of governments bailed out failing financial institutions because the services that these institutions provide are critical to households, companies, and governments. Governments intervened to support these institutions in order to allow for the continuous function of the financial system.<sup>7</sup> Following the financial crisis, the development of a new tool known as bail-in intended to manage the failure of financial firms. Bail-in was first implemented in Cyprus and then it was developed as a policy for Eurozone.<sup>8</sup>

The financial system of Cyprus was closed and tightly controlled including inward-looking and conservative banks until 2000. Financial Institutions in Cyprus are regulated and supervised by three authorities: (a) Central Bank of Cyprus (CBC), which is responsible for the supervision of commercial banks and the cooperative credit institutions; (b) the Superintendent for Insurance Control (SI), and (c) the Cyprus Securities and Exchange Commission (CySEC). However, due to changes that were introduced by the EU's Single Supervisory Mechanism (SSM) in 2014, the supervision of all the Eurozone's largest banks was transferred to the European Central Bank (ECB). To this end, the supervision of the Bank of Cyprus, Hellenic Bank and RCB Bank was transferred from the CBC to the ECB (<https://www.cypprusprofile.com/en/doing-business/legal-and-regulatory-framework>).

Following the turn of the century, a number of events drastically altered the environment such as the liberalization of the financial system, Cyprus' entry to the European Union and adoption of the euro.<sup>9</sup> The bad management of this transition from banks, supervisors, and the political system in general eventually led to the banking crisis.

The depositor bail-in of March 2013 was an unprecedented event. The deteriorating European economic environment (especially in Greece) following the global financial crisis is considered the primary cause of the banking crisis. The public debt crisis in Greece triggered the banking crisis in Cyprus.<sup>8</sup> Additional factors that contributed to this uncharted territory for the banking sector were bad choices regard-

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<sup>7</sup> L. Chennells and V. Wingfield 'Bank Failure and Bail-In: An Introduction' (2015) 55(3) *Bank of England Quarterly Bulletin* 228–242.

<sup>8</sup> S.A. Zenios 'Fairness and Reflexivity in the Cyprus Bail-In' (2014) *The Wharton Financial Institutions Center Working Paper No. 14-04*.

<sup>9</sup> S. Clerides 'The Collapse of the Cypriot Banking System: A Bird's Eye View' (2014) 8(2) *Cyprus Economic Policy Review* 3–35.

ing public finances, bad political decisions, weak corporate governance, the haircut of the Greek government bonds, and inadequate regulation of cross-border banking.<sup>10</sup>

The recapitalisation of the banking system and the resulting bail-in have been imposed on Cyprus and had an estimated impact of €7 billion on the country's banking system and uninsured depositors. Overall there was a €17 billion rescue package between the government of Cyprus and the Troika (the International Monetary Fund (IMF), the European Central Bank (ECB) and the European Commission (EC)), which consisted of €10 billion in the form of a loan plus €7 billion from the bail-in. This led to the resolution of one of Cyprus' two biggest banks and to the restructure of the other. Capital controls had to be imposed within the Eurozone for the first time resulting in the *devaluation* of the euro in Cyprus.<sup>10</sup>

The bail-in period was building up a number of imbalances and risks. The biggest risk was considered to be the stability of the banking system.<sup>11</sup> Therefore, auditors had to face a higher level of risk after the global financial crisis and an even higher risk during the bail-in period. Consequently, it is a good opportunity to analyse how auditors respond to higher risk levels in the banking sector by examining the change in audit fees of Cypriot banks.

### **1.2 Research Purpose**

The paper aims to investigate the impact of the global financial crisis and the resulting bail-in on audit fees of Cypriot banks as a result of increased audit risks. I find a positive and significant correlation between audit fees and post-crisis variable and an even more significant relationship between audit fees and bail-in variable. This implies that there was an increase in audit fees after the crisis period (2008-2012) compared to the pre-crisis period (2000-2007) and a larger and more significant increase during the bail-in period (2013-2015) compared to the pre-bail-in period (2000-2012). The result suggests that auditors appeared to have increased their audit work in order to decrease the detection risk, as the level of business risk was higher after the crisis and significantly higher during the bail-in period. Possible measures that auditors could implement are additional audit procedures, more time spent on the audit process and the use of more experienced staff. Therefore, it seems that auditors responded to higher inherent risk by increasing their audit fees

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<sup>10</sup> A. Michaelides 'Cyprus: From Boom to Bail-In' (2014) 29(80) *Economic Policy* 639–689.

<sup>11</sup> G.A. Hardouvelis 'Overcoming the Crisis in Cyprus' (2014), *Economy & Markets*, IX (1), 1–20.

as a result of incremental audit effort during the periods under investigation. This is in line with Xu et al.<sup>12</sup> who found a rise in audit fees and audit procedures during the global financial crisis. Alexeyeva and Svanström<sup>13</sup> also found that auditors charged higher audit fees during the post-crisis period compared with the pre-crisis period. This study uses the period of 2008-2012 as the crisis period as the Cypriot economy started facing fiscal imbalances in 2008 resulting from the 2008 presidential election and the worsening European sovereign debt crisis.<sup>10</sup> Following the crisis period, the bail-in period of 2013-2015 is used as the bail-in that took place in March 2013.<sup>10</sup>

### ***1.3 Contribution of the Study***

This study contributes to the existing literature in a number of ways:

*Firstly*, prior literature related to this study is available in the U.S., Australia, China, Hong Kong, Sweden, and the UK. This study will contribute to the existing literature by examining the impact of the crisis in Cyprus, a European Union country that has been affected by the crisis in a way that no other country experienced ever before in the world. The post-crisis period had led to a rescue package by the European Union, which incorporated a bail-in of the banking sector. It is worth noting that financial services companies are excluded from the majority of studies. To this end, it is considered both an opportunity and beneficial to examine the effect of the crisis and bail-in in the banking sector as a component of the financial services sector.

*Secondly*, this study provides decisive evidence on the impact of the financial crisis on audit fees and how audit fees are related to the higher risk after the global financial crisis. Prior studies analysed two possible effects of the economic downturn on audit fees. The literature review section discusses that the crisis might lead to lower or higher audit fees. Therefore, this study investigates how audit fee levels are associated with the post-crisis period in Cyprus.

*Thirdly*, it is important to note that there is no prior study examining the impact of bail-in on the audit fees of banks, as bail-in has never before been applied any-

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<sup>12</sup> Y. Xu, E. Carson, N. Fargher and L. Jiang 'Responses by Australian Auditors to the Global Financial Crisis' (2013) 53(1) *Accounting & Finance* 301–338.

<sup>13</sup> I. Alexeyeva and T. Svanström 'The Impact of the Global Financial Crisis on Audit and Non-Audit Fees: Evidence from Sweden' (2015) 30(4/5) *Managerial Auditing Journal* 302–323.

where else in Europe.<sup>8</sup> This constitutes unchartered territory for the global banking sector and the financial services sector at large.

*Lastly*, regulators, auditors, and financial information users will make good use of the findings in future studies. This study might be useful for auditors as a self-assessment method to distinguish auditors' responses to the financial crisis and bail-in periods. They can examine whether or not sufficient resources were invested by auditors towards addressing the increased risks in response to the financial downturns. Auditors' strategies can also be assessed including the level of professional scepticism employed over key areas and in general to the approach of audit processes. As a result, regulators can make a reasonable judgement on whether auditors' practises were appropriate after the crisis and during the bail-in periods. Regulators can also use the analysis of audit fees for the three sample periods (pre-crisis, post-crisis, and during the bail-in periods) in order to anticipate the pricing of audit services.

#### ***1.4 Structure of the Paper***

The remainder of this paper is structured as follows. *Section 2*, provides the framework for the hypotheses development resulting from the analysis of prior research papers linked to the area under examination. *Section 3* addresses the methodology followed including the sample selection and the audit fee model. Thereafter, *Section 4* presents the results obtained, the additional test, and robustness check. Finally, *Section 5* provides the conclusion, some limitations of the study, as well as opportunities for future research.

## **2. Background Information and Literature Review**

The Global Financial Crisis (GFC) and bail-in resulted in the further development of the banking regulatory framework and the financial services sector compliance regulations, increase in audit failure risk, and higher litigation risk. Therefore, it was harder for auditors to acquire sufficient appropriate evidence to decrease audit risk to an acceptable level.<sup>12</sup> According to ISA 200,<sup>14</sup> *'the auditor shall obtain sufficient appropriate evidence to reduce audit risk to an acceptably low level and thereby enable the auditor to draw reasonable conclusions on which to base the auditor's opinion'*.

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<sup>14</sup> International Standard on Auditing 200 'Overall Objectives of the Independent Auditor and the Conduct of an Audit in Accordance with International Standards on Auditing' (2010) ISA - *International Standards on Auditing* 71.

ISA 315,<sup>15</sup> states that ‘*auditors must follow the risk based approach to assess the risks, address the risks and review the results to confirm that the risk of material misstatement had been reduced at an acceptable level*’. Audit risk can be defined as the risk of stating that the financial statements are true and fair when in fact they are not and they are materially misstated. The two components of audit risk are the risk of material misstatement and detection risk. The risk of material misstatement consists of two sub-components as shown in the following formula:

$$\text{Audit Risk} = \text{Inherent Risk} \times \text{Control Risk} \times \text{Detection Risk}$$

Auditors use the above model as their planning tool to help them decide whether they would accept or reject the client. Inherent risk is the risk of errors or misstatements due to the nature of the company and its transactions. Control risk can be defined as the risk of errors or misstatements because the company’s internal controls are not strong enough to prevent, detect, and correct them. The inherent and control risks are in the control of the client and can also be referred to together as a business risk. The last component of the audit risk model, detection risk, is the risk that auditor’s procedures do not detect the errors or misstatements. Both inherent risk and control risk are in the control of the client and cannot be directly influenced by the auditors.

It is argued that auditors must reduce the detection risk when inherent and control risks of companies are high, in order to keep the total audit risk at an acceptable level.<sup>16</sup> The selection of a larger sample size, the use of more experienced staff and increased substantive testing can reduce the detection risk.

Two additional risk-management strategies including increased propensity to issue going-concern modified audit reports and increased audit effort are identified.<sup>12</sup> The main purpose of the research was to investigate the changes in auditors’ behaviour during the global financial crisis period in Australia by observing whether the GFC influenced the propensity of auditors to issue going-concern modified audit reports and audit effort. A sample of listed non-financial companies was selected and the two periods under examination were 2005-2007 (pre-financial crisis period) and 2008-2009 (the financial crisis period). They conclude that the pro-

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<sup>15</sup> International Standard on Auditing 315, available at [www.frc.org.uk/Our-Work/Publications/APB/ISA-315-Identifying-and-assessing-risks-of-material-misstatement.pdf](http://www.frc.org.uk/Our-Work/Publications/APB/ISA-315-Identifying-and-assessing-risks-of-material-misstatement.pdf) (last accessed: 20 November 2015).

<sup>16</sup> C.E. Hogan and M.S. Wilkins ‘Evidence on the Audit Risk Model: Do Auditors Increase Audit Fees in the Presence of Internal Control Deficiencies?’ (2008) 25(1) *Contemporary Accounting Research* 219–242.

pensity to issue going-concern opinions and audit effort, as proven by audit fees, were increased during the financial crisis period compared with the pre-financial crisis period. Their result designates that there was an increase in audit fees during the period 2008-2009 compared with the period 2005-2007 due to higher business risk and increased audit procedures. They also conclude that auditors responded to higher risk exposure during the GFC period by increasing audit work and thus there was an increased likelihood to provide going-concern opinions.

The failure of the audit industry to detect or predict company failures in the financial services sector can be regarded as one of the reasons for the financial crisis. Many accounting issues and inadequacies were revealed during the global financial crisis and bail-in periods. For instance, certain companies used financial engineering and creative accounting policies to improve the appearance of their financial statements. Several financial institutions also collapsed without any advance warning from their auditors during the financial crisis of 2008-2009.<sup>17</sup> As a result, the authenticity of the auditing profession was immensely criticised and doubts about the role and quality of external auditing were raised. The public attention was mainly concentrated on the extremely high fees charged to clients by auditors during the crisis period (p.868).<sup>18</sup> Following the global financial crisis, the bail-in crisis hit Cyprus, which resulted from a deteriorating European economic environment, the haircut of the Greek government bonds and other contributing factors including inadequate regulation and insufficient auditing.<sup>10</sup>

A difficult environment was created for companies after the financial crisis and during bail-in periods and this led to the failure of some firms as stated earlier. Therefore, auditors are required to give additional assurance for the viability of companies in order to help investors regain confidence. Schwartz and Menon<sup>19</sup> claim that shareholders require additional assurances when a company is facing financial difficulties. Therefore, higher quality auditors may be preferred during and after economic downturns to provide shareholders with the necessary assurances concerning the credibility of the financial statements. Therefore, auditors who offer

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<sup>17</sup> R. Doogar, S.P. Rowe and P. Sivadasan 'Asleep at the Wheel (Again)? Bank Audits During the Lead-Up to the Financial Crisis' (2015) 32(1) *Contemporary Accounting Research* 358–391.

<sup>18</sup> P. Sikka 'Financial Crisis and the Silence of the Auditors' (2009) 34(6) *Accounting, Organizations and Society* 868–873.

<sup>19</sup> K.B. Schwartz and K. Menon 'Auditor Switches by Failing Firms' (1985) 60(2) *The Accounting Review* 248–261.



higher quality services may charge their clients higher audit fees. Abbott et al.<sup>20</sup> suggest that big audit firms charge their clients higher audit fees due to the provision of a high quality of service. Therefore, greater assurance is offered compared to the smaller audit firms.

Prior studies have investigated the impact of the financial crisis on audit fees concluding that this event influenced the amount of audit fees. Alexeyeva and Svanström<sup>13</sup> examine the impact of the Global Financial Crisis (GFC) on audit and non-audit fees in Sweden by investigating the audit and non-audit fees of 714 listed firms during pre-GFC (2006-2007), GFC (2008-2009), and post-GFC (2010-2011) periods. Their main finding is that auditors charged higher audit fees during the post-global financial crisis compared with the pre-GFC period due to a structural change in the audit fee model. Their results also show that non-audit fees decreased in the GFC and post-GFC periods as difficult economic conditions may force companies to prioritise cost-savings<sup>13</sup> and to this end focus on their core activities.

Gul et al.<sup>21</sup> have examined during the economic recession in Hong Kong the correlation between two variables: conservatism and audit fees. Using observations from companies listed in the Hong Kong stock exchange and the normal audit fee model, they conclude that there is a negative correlation between the two variables i.e. during the financial downturn audit fees have gone up and conservatism decreased. They also find that there was a relationship between significant differences in conservatism between the downturn years (1996-1997) and non-downturn years (1994-1995) and audit fees. To assure themselves that higher audit fees are related to lower conservatism and not directly to the downturn, they have investigated the relationship between the conservatism measure and audit fees over a longer period. They find a negative relationship and they attribute it to the reduced level of inherent risks that auditors assign to firms, which adopt conservative accounting policies. Conservative reporting improves the credibility of accounting figures and therefore auditors are required to perform less substantive tests. Ultimately, this reduced need for testing leads to lower overall audit risk.

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<sup>20</sup> L.J. Abbott, S. Parker, G.F. Peters and K. Raghunandan 'An Empirical Investigation of Audit Fees, Non-Audit Fees, and Audit Committee' (2003) 20(2) *Contemporary Accounting Research* 215–234.

<sup>21</sup> F.A. Gul, B. Srinidhi and T. Shieh 'The Asian Financial Crisis, Accounting Conservatism and Audit Fees: Evidence from Hong Kong' (2002) SSRN eLibrary, available at <https://www.researchgate.net/publication/228306596>.

Zhang and Huang<sup>22</sup> have conducted a study in China and their research purpose is to examine the correlation between audit fees and firm risk during the GFC period of 2007-2008. They find that auditors charged higher fees in the presence of higher firm risk during the crisis. They also conclude that auditors' effort was increased following the crisis and as a result firms' auditing was affected. The findings also suggest that any potential audit failures can be avoided by increased audit scope.

The positive relationship between audit fees and firm risk is consistent with other studies. Bell et al.<sup>23</sup> among other things examine whether the audit fees are related to auditors' perceived business risk in the U.S. using data from a large international accounting firm for 422 audits. They find that the number of audit hours increase in the presence of high business risk. Hill et al.<sup>24</sup> explore the relationship between audit fees and client business risk in the Savings and Loan (S&L) industry throughout the period 1983-1988. The positive and significant correlation between client business risk and audit fees indicates that auditors were more careful to the risks associated with S&L during the period 1983-1988. Simunic and Stein<sup>25</sup> also find that auditors responded to higher inherent risk by increasing their audit fees because of incremental audit procedures. This result is in line with the findings of Simunic<sup>26</sup> who investigated the cost of audit-related services, and his audit fee model suggests that audit fees have a positive correlation with the client's business risk. Findings show that audit fees, particularly in the banking sector, are expected to rise during a crisis. The use of risk premium is another way to respond to the client's increased risk. Auditors might use risk-adjusted billing rates to compensate for possible losses such as litigations, sanctions, impaired reputation, and financial costs.<sup>27</sup>

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<sup>22</sup> T. Zhang and J. Huang 'The Risk Premium of Audit Fee: Evidence from the 2008 Financial Crisis' (2013) 1(1) *China Journal of Accounting Studies* 47-61.

<sup>23</sup> T.B. Bell, W.R. Landsman and D.A. Shackelford 'Auditors' Perceived Business Risk and Audit Fees: Analysis and Evidence' (2001) 39(1) *Journal of Accounting Research* 35-43.

<sup>24</sup> J.W. Hill, R.J. Ramsay and D.T. Simon 'Audit Fees and Client Business Risk During the S & L Crisis: Empirical Evidence and Directions for Future Research' (1994) 13(3) *Journal of Accounting and Public Policy* 185-203.

<sup>25</sup> D.A. Simunic and M.T. Stein 'The Impact of Litigation Risk on Audit Pricing: A Review of the Economics and the Evidence' (1996) 15(2) *Auditing: A Journal of Practice & Theory* 119-134.

<sup>26</sup> D.A. Simunic 'The Pricing of Audit Services: Theory and Evidence' (1980) 18(1) *Journal of Accounting Research* 161.

<sup>27</sup> C.A. Brumfield, R.K. Elliot and P.D. Jacobsen, 'Business Risk and the Audit Process' (1983) 155(4) *Journal of Accountancy* 60-68.

A number of studies have been conducted on the impact of economic downturns on audit fees and it has been observed that audit fees are sometimes decreased during and after an economic crisis. A possible reason for this can be increased competitive audit market during economic downturns as economic fluctuations often cause changes in market conditions. Audit firms tend to involve competitive pricing aiming to keep and gain clients. Beattie and Fearnley<sup>28</sup> suggest that, due to higher competition, audit firms may have to compete for clients by tendering for audit services. This may result in substantially lower audit fees. Casterella et al.<sup>29</sup> also find that audit fees are high when the bargaining power of clients is low and audit fees are low in the presence of increased competition associated with high clients' bargaining power. Abdel-Khalik<sup>30</sup> examines the association between economic conditions in various U.S. regions and audit market competition. He finds that demand for audit services fell and competition among audit firms increased during economic downturns.

Maher et al.<sup>31</sup> investigate the behaviour of audit fees with increased competition between 1977 and 1981 and find a fall in audit fees resulting from higher competition during the economic downturn of the late 1970s and early 1980s. This has instigated a federal investigation of the competitive environment in the audit profession, which eventually has brought changes to the profession. However, it is important to consider that banks were not included in the sample and may have impacted on the findings of the study because regulation changes in the banking industry may have affected the structure of audit fees.

Krishnan and Zhang<sup>32</sup> conduct a study in the U.S. and explore the correlation between audit fees and the quality of financial reporting of banks during the financial crisis of 2008-2009. They conclude that 32% of banks received cuts in audit fees by their auditors during the period 2008-2009. These results are consistent with the

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<sup>28</sup> V.A. Beattie and S. Fearnley 'The Changing Structure of the Market for Audit Services in the UK: A Descriptive Study' (1994) 26(4) *British Accounting Review* 301–322.

<sup>29</sup> J.R. Casterella, J.R. Francis, B.L. Lewis and P.L. Walker 'Auditor Industry Specialization, Client Bargaining Power, and Audit Pricing' (2004) 23(1) *Auditing: A Journal of Practice & Theory* 123–140.

<sup>30</sup> A.R. Abdel-Khalik 'The Jointness of Audit Fees and Demand for MAS: A Self-Selection Analysis' (1990) 6(2) *Contemporary Accounting Research* 295–322.

<sup>31</sup> M.W. Maher, P. Tiessen, R. Colson and A.J. Broman 'Competition and Audit Fees' (1992) 67(1) *The Accounting Review* 199–211.

<sup>32</sup> G.V. Krishnan and Y. Zhang 'Is there a Relation Between Audit Fee Cuts During the Global Financial Crisis and Banks' Financial Reporting Quality?' (2013) 33(3) *Journal of Accounting and Public Policy* 279–300.

findings of McCann,<sup>33</sup> who reports that audit fees fell in 2008 and 2009. Audit fees fell by an average of 8% in 2008 for companies with revenues ranging from \$100 million to \$250 million and by 5% for those companies that had revenues from \$250 million to \$500 million. Likewise, Whitehouse<sup>34</sup> reports that ‘63% of the S&P 500 firms won price concessions for 2009 from their external auditors’.

### **2.1 Hypothesis Development**

Carrying on the existing discussion from prior literature, the authors hypothesise the following:

*H1: Auditors for banks charge higher audit fees in the post-global financial crisis up to the bail-in period compared to the pre-global financial crisis period.*

*H2: Auditors for banks charge higher audit fees during the bail-in period compared to the pre-bail-in period.*

The existing literature provides mixed evidence regarding the impact of the global financial crisis on audit fees. Some studies find an increase in audit fees during and after the crisis period<sup>12,22</sup> in response to increased business risk. Entity risk is likely to increase after the global financial crisis and bail-in periods. Therefore, auditors may have to increase their audit work and perform more procedures. Bell et al.<sup>23</sup> find that the audit work is performed more extensively in the presence of high business risk. They suggest that auditors’ risk-based approach is associated with increased audit effort. Choi et al.<sup>35</sup> also find that auditors increase their efforts in a higher risk environment. Thus, auditors may improve the quality of their work by obtaining more reliable evidence through the selection of a bigger sample, by using more experienced staff, by improving their substantive procedures, and by obtaining a second partner review.

The auditors conduct the audit with the attitude of professional skepticism, which includes a questioning mind and a critical assessment of evidence. Their professional skepticism has to be alert after the financial crisis and during bail-in periods because firms’ reduced performance may induce managers to manipulate

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<sup>33</sup> D. McCann ‘Audit-Fee Fall: It’s a Matter of Trust’ (2010) *CFO*, available at <http://ww2.cfo.com/accounting-tax/2010/10/audit-fee-fall-its-a-matter-of-trust/> (last accessed 25 November 2015).

<sup>34</sup> T. Whitehouse ‘Exclusive Report: Audit Fees Continue to Plummet’ (2010) *Compliance Week*, available at <http://www.complianceweek.com/exclusive-report-audit-fees-continue-to-plummet/article/186924> (last accessed 22 November 2015).

<sup>35</sup> J. Choi, J. Kim, X. Liu and D.A. Simunic ‘Audit Pricing, Legal Liability Regimes, and Big 4 Premiums: Theory and Cross-Country Evidence’ (2008) 25(1) *Contemporary Accounting Research* 55–99.

financial results in order to meet higher targets and get bonuses and better remuneration packages. Therefore, the possibility of using various methods such as window dressing and creative accounting to improve the financial results is increased. Additionally, the likelihood of accounting fraud increases in companies facing financial difficulties and viability issues during the crisis.<sup>22</sup> To minimise the associated risks of such methods used by managers, auditors may take counter measures including additional audit procedures and more substantive testing, which inevitably will result in higher audit fees. Higher audit fees are also charged to reflect the higher risk of any litigation proceedings against auditors.

However, research from other studies reveals that audit fees are sometimes decreased during and after the crisis period.<sup>32,33</sup> Greater financial pressure during and after the crisis might lead banks to negotiate more strongly for lower audit fees. Therefore, it is an empirical question to verify whether the hypothesis is supported or not.

Although there are mixed results in the literature, it is expected that after the financial crisis period, audit work will increase resulting in higher audit fees compared to the pre-crisis period and an even further increase will occur during the bail-in period compared to the pre-bail-in period.

### 3. Data Research and Methodology

#### 3.1 Sample Selection

The sample selected in this study is based on Cypriot banks, as the banking industry is the focus of this paper. I obtained the data required for the study from banks' annual reports and this data collection methodology is consistent with Alexeyeva and Svanström<sup>13</sup> who obtained companies' data directly from annual reports. The financial statements of the listed companies are publicly available. However, some annual reports were collected directly from the finance departments of the various banks having sent them a letter to officially request access to their annual reports. The response from all banks was positive and they welcomed my initiative requesting access to the findings upon the completion of the study. The period under study is 2000-2015, which includes data collected for the Cypriot banks during the following periods: *pre-global financial crisis* (2000-2007), *post-global financial crisis* (2008-2012), and *during the bail-in period* (2013-2015). Table 1 illustrates the relevant sample distribution by year.

**Table 1:** Sample distribution by year

The table shows the number of observations, which is the number of banks obtained in the period (2000-2015) under study.

Year	No of Observations	%
2000	6	3.95
2001	6	3.95
2002	6	3.95
2003	6	3.95
2004	9	5.92
2005	10	6.58
2006	10	6.58
2007	10	6.58
2008	11	7.24
2009	11	7.24
2010	11	7.24
2011	12	7.89
2012	13	8.55
2013	12	7.89
2014	12	7.89
2015	7	4.61
Total	152	100.00

Some variables for the period under investigation have been excluded, as information was not available. This is in line with Krishnan and Yu<sup>36</sup> who eliminated some observations because some variables had missing data.

The exclusion of missing variables reduced the sample size to 152 observations. To the eye of the observer, this may be viewed as one of the limitations of this study because a relatively smaller sample size may have an impact on the result of the model. However, the sample selected is representative of the whole population because the number of banks in Cyprus is small and includes all of the big banks. The number of banks/credit institutions registered in Cyprus is shown in the extract from the Central Bank of Cyprus in Appendix A.

<sup>36</sup> G.V. Krishnan and W. Yu 'Further evidence on knowledge spillover and the joint determination of audit and non-audit fees' (2010) 26(3) *Managerial Auditing Journal* 230–247.

### 3.2 Audit Fee Model

Simunic<sup>26</sup> established the original audit fee model evaluating the impact of different determinants on audit fees. He finds that the key explanatory variables are the client size, complexity of the business, firm's risk, and auditor size. Consequently, a number of studies have been conducted investigating the impact of different variables on audit fees in several countries.

The audit fee regression model is used to measure the impact of the global financial crisis and the resulting bail-in on audit fees. The dependent variable used in this study is the external audit fee charged for conducting the audit of each bank as reported in the annual reports, and the general model specification based on prior literature is as follows:

$$AUDIT FEES = \beta_0 + \beta_1 Size\ of\ Client + \beta_2 Complexity + \beta_3 Risk + \beta_4 Size\ of\ Auditor + \beta_5 Post-Crisis + \beta_6 Bail-In + \varepsilon$$

#### 3.2.1 Size of the Client

Size of the client (or auditee) has been found to be the most important factor in determining audit fees according to prior research.<sup>37</sup> There are two ways used to measure the size of a client such as total assets or total turnover of the firm. Simunic<sup>26</sup> used total assets as a measure for client size because 'the stock of assets seems more closely related to possible loss exposure than would an accounting flow measure, such as revenue, because defective financial statements, which result in a lawsuit, frequently involve some deficiency in asset valuation'<sup>26</sup> (p.172). A variety of subsequent studies used total assets as a measure for auditee size.<sup>38,39,40</sup>

It is reasonable to expect that audit fees will have a positive correlation with client size, as auditors will have to increase their efforts in a larger firm. They will have to perform additional substantive procedures ensuring adequate compliance in order to compensate for the increase in client size. Several studies support this view, as client size is strongly positively associated with the amount of audit fees.<sup>38-40</sup>

<sup>37</sup> D.C. Hay, W.R. Knechel and N. Wong 'Audit Fees: A Meta-Analysis of the Effect of Supply and Demand Attributes' (2006) 23(1) *Contemporary Accounting Research* 141–191.

<sup>38</sup> D.A. Simunic 'Auditing, Consulting, and Auditor Independence' (1984) 22(2) *Journal of Accounting Research* 679–702.

<sup>39</sup> I. Gerrard, K. Houghton and D. Woodliff 'Audit Fees: The Effects of Auditee, Auditor and Industry Differences' (1994) 9(7) *Managerial Auditing Journal* 3–11.

<sup>40</sup> M.O. Al-Harshani 'The Pricing of Audit Services: Evidence from Kuwait' (2008) 23(7) *Managerial Auditing Journal* 685–696.

However, Simunic<sup>26</sup> (p.172) hypothesised that the positive association between client size and audit fees is non-linear. Gerrard et al.<sup>39</sup> argued that the increase in client size results in the achievement of economies of scale by auditors, meaning that audit fees increase at a lower rate. A number of subsequent studies also support this non-linear relationship. As a result, natural logarithm of the auditee's total assets is commonly used to improve the linear relationship with audit fees and to ensure a better fit of this measure in the regression model. This is consistent with other studies, which followed the same procedure.<sup>41,42</sup>

*The study under discussion measures the size of the Cypriot banks by using the natural logarithm of total assets value.*

### 3.2.2 Complexity

Prior studies indicate that the level of client's complexity is another essential determinant of external audit fee.

By logical reasoning, an increase in organisation complexity is expected to result in increased audit fees because additional efforts and time will be required from auditors in planning, co-ordinating and conducting the audit of the firm.<sup>26,39</sup> It is argued that the more complex the client firm is, the higher the level of difficulty for auditors in reviewing transactions and evaluating the firm's financial statements.

There are difficulties in measuring the level of a firm's complexity according to prior studies. Complexity of the client can be measured by different ways, as it is a wide concept. Hay et al.<sup>37</sup> identified 33 specific metrics that may be used as proxies for complexity in an audit fee model. All the variables were positively correlated with audit fees. However, the number of subsidiaries and the number of foreign subsidiaries are the most commonly used measures. Other typical indicators of complexity in addition to these two measures are the proportion of foreign assets, the number of business segments, and a subjective complexity rating given by the audit team.

Palmrose<sup>42</sup> found that there is a non-linear relationship between audit fees and complexity. Due to non-linearity of this relationship, she used the natural logarithm of the measures of complexity and she found a positive and significant correlation with audit fees. This is in line with Al-Harshani<sup>40</sup> who followed the same procedure.

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<sup>41</sup> L. Barkess and R. Simnett 'The Provision of Other Services by Auditors: Independence and Pricing Issues' (1994) 24(94) *Accounting and Business Research* 99–108.

<sup>42</sup> Z. Palmrose 'Audit Fees and Auditor Size: Further Evidence' (1986) 24(1) *Journal of Accounting Research* 97–110.



*This study measures the complexity of banks by using the number of subsidiaries as a proxy.*

### 3.2.3 Risk

There are three metrics used to measure the risk such as inherent risk, leverage, and profitability, which are usually included in the audit fee model.

Inherent risk is the risk of errors or misstatements due to the nature of the company and its transactions. Prior literatures indicate a positive relationship between inherent risk and audit fees as auditors respond to higher inherent risk by increasing their audit procedures.<sup>26,37</sup> Incremental audit procedures result in higher audit fees as additional effort and time to identify clients' possible material misstatements and audit high risk certain parts of the audit have to be compensated. The two most risky areas to be considered are receivables and inventories according to Simunic<sup>26</sup> and specialised auditing procedures are recommended for these financial statement components. A combination of metrics is commonly used to capture inherent risk more precisely such as inventory divided by total assets, receivables divided by total assets, and the combination of inventory and receivables divided by total assets.<sup>37</sup>

*This study uses the proportion of trade receivables to total assets as an inherent risk metric due to the structure of the banks.*

Another measure of risk is considered to be client profitability. Generally, as the performance of an organisation worsens, higher risk is associated with an audit resulting in increased audit fees. There are two common variables used to measure the profitability of a client such as return on assets and existence of a loss (a dummy variable). The meta-analysis of Hay et al.<sup>37</sup> has reported a significant positive correlation between audit fees and a dummy variable for loss. Krishnan and Yu<sup>36</sup> have also found a positive relationship between these two variables. It is predicted that the correlation between audit fees and loss variable will be positive.

*This study includes the existence of a loss as a dummy variable in the audit fee model.*

Another metric of risk is considered to be leverage. Leverage ratio (ratio of debt to total assets) and quick (liquidity) ratio are the most common measures of leverage.<sup>37</sup> A high leverage ratio connotes higher risk to the audit firm as the financial health and stability of a firm are considered to be low due to the worsening financial results of a firm, resulting in higher audit fees. The equity-debt ratio, which is a

transformation of the leverage ratio, can be also used as a measure for leverage and yields consistent results.<sup>37</sup> It is expected that the relationship between audit fees and leverage will be negative.

*This study measures leverage by using the leverage ratio as defined by the Basel III (Total Equity (capital measure)/ Total Debt (exposure)) in the audit fee model.*

### 3.2.4 Auditor Size

The size of auditor is positively highly related to audit fees, as large accounting firms (known as ‘Big Eight/ Five/ Four’) receive a fee premium for the conduct of their audits.<sup>43,44</sup> Other studies support the strong positive correlation between audit fees and auditor size.<sup>42,45</sup> They have argued that the Big Eight firms charge higher audit fees and the higher audit fees are consistent with higher quality auditing services resulting from increased time spent and audit work compared to the non-Big-Eight accounting firms’ lower efforts.

*In this study, I do not include auditor size in the audit fee model because only the Big Four accounting firms audit the Cypriot banks and the inclusion of the variable would distort my results.*

### 3.3 Regression Model

The research paper’s main objective is to determine the impact of the global financial crisis and the resulting bail-in on audit fees based on audit risks. Banks are operating in a higher business risk environment after the global crisis and during the bail-in period. As a result, incremental efforts and audit procedures are required in order to decrease audit risk to an acceptable level. This is consistent with the findings of Simunic<sup>26</sup> who has examined the cost of audit services and he finds that audit fees have a positive correlation with client’s business risk, which is expected to rise during a crisis, particularly in the banking sector.

Alexeyeva and Svanström<sup>13</sup> and Ferguson et al.<sup>43</sup> used a model modelling audit fees in relation to business risk. A regression model is used to examine the impact

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<sup>43</sup> A. Ferguson, J.R. Francis and D.J. Stokes ‘The Effects of Firm-Wide and Office-Level Industry Expertise on Audit Pricing’ (2003) 78(2) *Accounting Review* 429–448.

<sup>44</sup> T.V. Caneghem, ‘Audit Pricing and the Big 4 Fee Premium: Evidence from Belgium’ (2010) 25(2) *Managerial Auditing Journal* 122–139.

<sup>45</sup> D.T. Simon and J.R. Francis ‘The Effects of Auditor Change on Audit Fees: Tests of Price Cutting and Price Recovery’ (1988) 63(2) *Accounting Review* 255–269.

of the two periods on audit fees. The regression analysis is multivariate with the dependent variable to be the natural logarithm of audit fees. The independent variables are firm-specific variables including size of the client, complexity, and firm's risk. Their measures are illustrated in Table 2 (as discussed in Section 3.2). The regression equation also includes indicator variables of the post-crisis and bail-in periods.

**Table 2:** Main audit fee measures and their variables

The table shows the independent variables used in the regression equation below.

Measure	Variable
Size of Client	Natural log of total assets
Complexity	Natural log of the number of subsidiaries
Firm's Risk	Leverage, proportion of receivables to total assets, existence of loss

Audit fee model equation:

$$LNAF = \beta_0 + \beta_1POST-CRISIS + \beta_2BAIL-IN + \beta_3LNTA + \beta_4LNSUBS + \beta_5LEV + \beta_6RECTA + \beta_7LOSS + \varepsilon$$

Where,

- LNAF: Natural logarithm of audit fees
- POST-CRISIS: Indicator variable of the post-crisis period taking the value of 1 during 2008-2012, otherwise 0
- BAIL-IN: Indicator variable of the bail-in period taking the value of 1 during 2013-2015, otherwise 0
- LNTA: Natural logarithm of total assets
- LNSUBS: Natural logarithm of the number of subsidiaries
- LEV: Leverage ratio (Gearing ratio) as defined by the Basel III: Total Equity (capital measure)/ Total Debt (exposure)
- RECTA: Accounts receivables divided by total assets
- LOSS: A dummy variable that equals 1 if the firm made a loss, otherwise 0

In order to capture the effects of changed economic conditions, I include two indicator variables, POST-CRISIS and BAIL-IN, taking the value of 1 for periods (2008-2012) and (2013-2015) respectively, and 0 otherwise. If the hypothesis is supported, i.e. if auditors are exposed to higher risk post the financial crisis and during bail-in periods compared to previous years, they will charge higher audit fees post financial crisis and even greater fees during the bail-in period. Therefore, I expect that the POST-CRISIS and BAIL-IN variables of interest to be significantly positively correlated with audit fees.

#### 4. Descriptive Statistics and Analysis of Results

In order to test the hypotheses about the impact of global financial crisis and bail-in on audit fees, the following three samples were investigated: *Pre-global financial crisis period* (2000-2007), *post-global financial crisis period* (2008-2012), and *during bail-in period* (2013-2015). The whole study period includes all banks selected. I carried out descriptive and inferential statistics on all three investigated samples to provide a summary of the data and to detect any possible emerging patterns. Tables 3 and 4 below exhibit the results of the summary statistics.

**Table 3:** Descriptive and inferential statistics for audit fees and control variables for hypothesis 1 ( $H_1$ )

<b>2000-2007 (Pre-Financial Crisis Period)</b>					
	<b>Mean</b>	<b>Standard Deviation</b>	<b>3rd Quartile</b>	<b>Median</b>	<b>1st Quartile</b>
<b>LNAF</b>	11.72	1.35	12.74	11.72	10.41
<b>LNTA</b>	21.56	1.64	22.74	21.94	19.71
<b>LNSUBS</b>	1.70	1.35	3.22	1.39	0.69
<b>LEV</b>	10.18	62.96	0.92	0.78	0.38
<b>RECTA</b>	0.03	0.03	0.05	0.01	0.01
<b>LOSS</b>	0.35	0.48	1.00	0.00	0.00
<b>n</b>	63				

<b>2008-2012 (Post-Financial Crisis Period)</b>							
	<b>Mean</b>	<b>Standard Deviation</b>	<b>3rd Quartile</b>	<b>Median</b>	<b>1st Quartile</b>	<b>Pre-Crisis to Post-Crisis t-Value</b>	<b>p-Value</b>
<b>LNAF</b>	12.44	1.52	12.72	11.71	11.26	-1.93 *	0.06
<b>LNTA</b>	22.16	1.63	22.87	22.28	20.41	-2.45 **	0.02
<b>LNSUBS</b>	1.65	1.33	2.94	1.79	0.69	0.60	0.55
<b>LEV</b>	1.55	3.35	0.84	0.48	0.13	1.02	0.31
<b>RECTA</b>	0.01	0.01	0.01	0.00	0.00	3.00 ***	<0.01
<b>LOSS</b>	0.44	0.50	1.00	0.00	0.00		
<b>n</b>	58						

**Table 4:** Descriptive and inferential statistics for audit fees and control variables for hypothesis 2 (H<sub>2</sub>)

<b>2013-2015 (Bail-In Period)</b>							
	<b>Mean</b>	<b>Standard Deviation</b>	<b>3rd Quartile</b>	<b>Median</b>	<b>1st Quartile</b>	<b>Pre-Crisis to Post-Crisis t-Value</b>	<b>p-Value</b>
<b>LNAF</b>	12.70	1.49	13.85	12.13	11.35	-2.46 **	0.02
<b>LNTA</b>	21.85	1.45	22.72	21.73	20.33	-0.76	0.45
<b>LNSUBS</b>	2.05	1.33	3.23	2.48	0.69	-1.18	0.24
<b>LEV</b>	10.48	32.01	5.15	1.36	0.44	-0.51	0.61
<b>RECTA</b>	0.01	0.01	0.01	0.01	0.00	2.31 **	0.02
<b>LOSS</b>	0.73	0.46	1.00	1.00	0.00		
<b>n</b>	31						

\*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels respectively

The descriptive statistics tables show that the lowest value of the dependent natural logarithm audit fees (LNAF) was before the crisis and the highest value was during the bail-in period. The mean of LNAF, before the crisis, was 11.72 and increased to 12.44 after the crisis indicating that audit fees increased after the economic downturn. Following the crisis, the mean of LNAFE increased to 12.70 during the bail-in period indicating that audit fees increased even more during the bail-in period compared to the pre-bail-in period (including pre-crisis and post-crisis periods). The difference in the mean from pre-crisis to post-crisis is significant at the 10% level with a p-value of 0.06 and the difference in the mean from pre-bail-in period to bail-in period is significant at the 5% level with a p-value of 0.02. These results suggest that there may be an increase in audit fees after the financial crisis and during the bail-in periods compared to prior periods based on their mean values. However, I will need to carry out regression analysis in order to identify the association between these two periods and audit fees.

Turning to control variables, the LOSS variable followed the same trend, whose mean increased from 0.35 before crisis to 0.44 after crisis and then rose even further to 0.73 during the bail-in period. This indicates that a larger number of banks were loss-making after the crisis and even more banks during the bail-in period due to the negative effects of these two periods on the economy.

The mean of the total assets (LNTA) increased from 21.56 to 22.16 between pre-crisis and post crisis periods as banks' customers were not repaying their loans and the interest charges attached to the loans were capitalised, increasing the loan amounts due from customers. Loans to customers fall under the financial assets category, which comprises a significant proportion of total assets. Following the crisis, the mean of LNTA declined to 21.85 during the bail-in period because the loans that were securitised by deposits were written off up to the amount of the deposits that were cut resulting in a huge amount of impairment/provisioning. Some loans were also restructured.

The mean of subsidiaries (LNSUBS) decreased post the financial crisis period indicating that banks decreased their operations by closing down existing subsidiaries and turned their focus to their main business. This is also in line with the deleveraging policy that led banks to closing down primarily overseas subsidiaries and any other local non-core business subsidiaries. Surprisingly, the mean of LNSUBS increased to 2.05 during the bail-in period suggesting that banks have started new operations by opening new subsidiaries. Banks incorporated new subsidiaries

during the bail-in period in view of a new policy that has been adopted to acquire properties in settlement of their customers' debts during the reorganisation and restructuring process of non-performing loans. These properties are held directly or through companies (SPE-Special Purpose Entities) controlled by the bank whose sole business activity is the management of these properties.

Leverage, receivables to total assets (RECTA) and loss variables are measures of firm's risk as discussed in Section 3.2. Table 3 shows that the crisis led to a higher level of risk as the mean of leverage (LEV) decreased substantially from 10.18 to 1.55. This implies that lower profitability resulted in substantially lower total equity. The increasing trend of the LOSS variable's mean indicates lower profitability after the crisis. Following the crisis, the recapitalisation of a number of banks (including the large ones) through bail-in uninsured deposits and debt securities led to a higher LEV ratio of 10.48 during the bail-in period. New investors and the government also invested substantial capital in some of the banks. The level of risk seemed to be lower during the bail-in period according to the LEV ratio. The mean of RECTA decreased slightly from 0.03 to 0.01 between pre-crisis and post-crisis. Following the crisis, the value remained the same (0.01) during the bail-in period. Possible reasons are the increase in total assets and banks might have had only long-term loans whereby their repayment period exceeded 12 months. This might indicate a higher level of risk post the financial crisis period and during the bail-in period. The increase in the mean of LOSS variable also indicates an increased level of risk during the two periods. Its increase of 0.09 from pre-crisis period to post-crisis period indicates that a larger number of banks were loss-making due to the negative impact of the economic downturn on the economy. During the bail-in period, the mean of LOSS variable rose to 0.73, implying an even larger number of banks were making a loss.

#### ***4.1 Correlation Analysis***

Correlation analysis is useful for investigating the degree of relationship between variables. The strength of association between the variables can be determined by the Pearson's correlation coefficient whose range is between -1 and 1.

Correlation greater than 0.8, can result in a multicollinearity effect according to Judge et al.<sup>46</sup> (p.868). A high correlation figure (above 0.8) amongst two inde-

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<sup>46</sup> G.G. Judge, R.C. Hill, W.E. Griffiths, H. Lutkepohl and T.C. Lee Introduction to the Theory and Practice of Econometrics (2<sup>nd</sup> edn, New York, NY: Wiley, 1988).

pendent variables can lead to biased regression estimates and higher standard errors. There will also be difficulty in differentiating the contribution of the individual variables. Therefore, it is important to measure the extent of multicollinearity by examining the correlation coefficient between the independent variables. Table 5 displays the matrix of correlations between the variables for the audit fee model including 152 observations for the whole sample period.

**Table 5:** Correlation matrix between the dependent and independent variables during the whole sample period from 2000 to 2015

	LNAF	POST-CRISIS	BAIL-IN	LNTA	LNSUBS	LEV	RECTA	LOSS
LNAF	1.00							
POST-CRISIS	0.135 (0.156)	1.00						
BAIL-IN	0.174 (0.067)	-0.376 (0.00)***	1.00					
LNTA	0.882 (0.00)***	0.155 (0.103)	0.005 (0.963)	1.00				
LNSUBS	0.767 (0.00)***	-0.057 (0.547)	0.111 (0.241)	0.703 (0.00)***	1.00			
LEV	-0.164 (0.084)*	-0.096 (0.313)	0.038 (0.687)	-0.163 (0.084)*	-0.021 (0.823)	1.00		
RECTA	-0.228 (0.012)**	-0.256 (0.007)***	-0.196 (0.034)**	-0.234 (0.013)**	-0.171 (0.071)*	0.038 (0.690)	1.00	
LOSS	0.003 (0.710)	-0.025 (0.589)	0.270 (0.002)***	-0.210 (0.045)**	0.048 (0.445)	0.143 (0.145)	-0.013 (0.958)	1.00

\*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels respectively

The highest correlation of 0.703 is between LNTA and LNSUBS and the second highest correlation of 0.270 is between BAIL-IN and LOSS according to Table 5. The significance of both correlations is also high at the 1% level with p-values of less than 0.01. The correlation among the majority of independent variables is low and below the suggested threshold of 0.8. Therefore, it can be deduced that my regression model is not negatively affected by multicollinearity.



### 4.2 Regression Analysis

Table 6 illustrates the result of the regression equation using the sample of 152 observations during the whole sample period from 2000 to 2015. The table examines whether there is an increase in audit fees after the global financial crisis and during the bail-in periods.

**Table 6:** Regression analysis

Variables	Expected Sign	Coefficient Value		p-Value
<b>Dependent Variable: LNAF</b>				
INTERCEPT	?	-2.928	***	0.001
POST-CRISIS	+	0.351	**	0.010
BAIL-IN	+	0.627	***	<0.001
LNTA	+	0.648	***	<0.001
LNSUBS	+	0.294	***	<0.001
LEV	-	-0.002		0.137
RECTA	+	3.121		0.249
LOSS	+	0.308	**	0.012
<b>F-value = 94.714</b>				
<b>Adjusted R2 = 86%</b>				
<b>n= 152</b>				

\*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels respectively

The research paper investigates seven variables, where three are highly significant and all the variables' coefficient values have the expected positive or negative sign. The fit of the audit fee model is high as shown by the adjusted R<sup>2</sup> of 86% in Table 6. It seems that the tested regression model fits the data well and 86% of the variation in the audit fees can be accounted for by the seven explanatory variables. However, the small number of observations might distort the value of adjusted R<sup>2</sup> by making it appear excessively high. It is also important to examine the joint significance of the slope coefficients using the F-statistic. The F value is significant indicating that the models have statistically significant predictive capability.

The most important variables of interest are POST-CRISIS and BAIL-IN, which are significantly positive and are in line with their expected signs. A p-value of

0.010 implies that the POST-CRISIS variable is significant at the 5% significance level, combined with a positive coefficient of 0.351. This is consistent with Alexeyeva and Svanström<sup>13</sup> who also have found out that the POST-CRISIS variable is significant and has a positive sign. The BAIL-IN variable is also positively related to audit fees as it is highly significant at the 1% level of significance with a p-value of less than 0.001 and a positive coefficient of 0.627. These results indicate an increase in audit fees after the crisis and an even further increase during the bail-in period suggesting that both hypotheses are supported. Therefore, this implies that auditors charged higher audit fees for the audit of Cypriot banks after the crisis compared to the pre-crisis period and even higher audit fees during the bail-in period compared to the pre-bail-in period (including pre-crisis and post-crisis periods) in order to compensate for incremental audit efforts in response to the increased level of business risk.

The coefficient sign of LNTA is consistent with its expected sign (positive) and it is strongly significant at the 1% level with a p-value of less than 0.001. The coefficient of LNTA of 0.648 is the second highest among the other variables implying that the natural logarithm of total assets can largely explain the increase in audit fees. This is further indicated by the p-value, which is the lowest amongst the other variables. This finding is in line with prior studies,<sup>47</sup> which confirm the importance of client size by identifying this variable as one of the most significant determinants of audit fees.

The measure of a client's complexity, which is the natural logarithm of the number of subsidiaries (LNSUBS), is strongly and positively associated with audit fees. Table 6 shows that LNSUBS is highly significant with a p-value of less than 0.001 and a positive sign as expected of 0.294. This implies that the higher the complexity level of the organisation, the higher the audit fees. This result is consistent with Simunic<sup>26</sup> who also measured the complexity of the organisation using subsidiaries and has found a positive, significant relationship with audit fees.

The coefficient sign of LEV is consistent with its expected sign (negative), but it is not significant. The coefficient sign of RECTA is also in line with its expected sign (positive) but it is not significant.

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<sup>47</sup> J.R. Francis and D.J. Stokes 'Audit Prices, Product Differentiation, and Scale Economies: Further Evidence from the Australian Market' (1986) 24(2) *Journal of Accounting Research* 383–393.

The signs of LNTA, LNSUBS and LOSS are in line with their expected signs and significant for the investigated period. The results indicate that the main determinants of audit fees are client size, complexity and risk, which are consistent with prior studies.

## 5. Additional Test

### *5.1 Control for Connection with Greece*

The exposure of Cypriot banks to Greece was high during the global financial crisis and bail-in periods. The Greece-Cyprus banking relationship is considered a main cause of the problems created in the banking sector of Cyprus.<sup>10</sup> A number of banks in Cyprus have operations in Greece and therefore it will be interesting to examine a possible effect on audit fees.

To control for this possible effect, I firstly identified the banks that have a minimum 25 per cent of their business in Greece and then I included a dummy variable, GREECE, in my audit fee model to control for the banks that are related to Greece. The methodology applied is consistent with Alexeyeva and Svanström<sup>13</sup> who included a dummy variable (USA) to control for the companies' relationship with the USA. The result is shown in Appendix B.

The result indicates that the GREECE variable is significant with a p-value of 0.025 at the 5% confidence level implying that the Greek economic environment affects the audit fees for Cypriot banks, which have a minimum 25 per cent of their business in Greece. The relationship between the GREECE variable and audit fees is negative with a coefficient value of -0.388 implying a decrease in audit fees. A possible reason for this reduction in audit fees could be the greater financial pressure that Cypriot banks (having operations in Greece) had to face. Therefore, an increase in financial distress might lead banks to negotiate more strongly for lower audit fees.

## 6. Robustness Check

### *6.1 The Effect of Companies' Risk Variables on Audit Fees*

The individual effect of risk variables on audit fees has been adopted from Alexeyeva and Svanström<sup>13</sup> as a sensitivity test for robustness. The methodology used is applicable to this study as it will be interesting to examine the individual impact of the companies' risk variables on audit fees for Cypriot banks.

Assuming an intricate relationship between the variables of interest (POST-CRISIS and BAIL-IN) and banks' risks, I examined the interaction between them. The critical main variables are considered to be those whose effects are of primary interest according to White and Lu. I hypothesised that including all risk variables simultaneously can have a cumulative impact on audit fees. Therefore, I included the different risk variables (LEV, RECTA, and LOSS), one by one, in the regression model in order to eliminate the risk of a possible cumulative impact. The results of these additional tests are shown in Appendix C.

The results indicate that audit fees increased after the global financial crisis and during the bail-in periods despite the level of banks' risks. The POST-CRISIS and BAIL-IN variables are significant in all three of the regression models indicating that my initial main regression model is insensitive to changes. The results are consistent with prior literature<sup>13</sup> that has also found out the variables of interest (GFC and POST-GFC) significant. The additional tests confirm the reported main results and contribute to the robustness of my analysis.

## ***6.2 Heteroscedasticity Tests***

I conducted the White's test for heteroscedasticity using EViews in order to ensure the reliability of the results from the regression analysis. The regression model is based on the assumption of equal variance for all the data of the dependent variable and this is called homoscedasticity. Therefore, it is important to carry out this test in order to test the data for heteroscedasticity.

Appendix D shows the results of the White's test on the data. The results indicate that my regression model suffers from heteroscedasticity as the probability of chi-square is less than 5%, indicating that it is significant. Therefore, the null hypothesis of homoscedasticity is rejected implying that the standard errors in the model might not be appropriate and hence any implications made could be misleading.

Therefore, I have re-run the regression model with White's heteroscedasticity-consistent standard errors and covariance. The estimated standard errors are now robust and t statistics are asymptotically standard, normally distributed and thus the reliance on p-values is feasible. Appendix E displays the results of the new regression model.

The results of the main regression model still hold with the variables of interest being significant. Therefore, this can further contribute to the robustness of my analysis.

## 7. Conclusion, Limitations and Suggestions

### 7.1 Conclusion

This study addresses the response of auditors to increased risk associated with the global financial crisis and bail-in periods in the banking sector of Cyprus. More specifically, this study focuses on how the post-crisis and bail-in periods affected the audit fees paid to auditors. The risk management approach that auditors adopt in response to increased risk is increased audit effort, which results in higher audit fees. Therefore, controlling for various other factors i.e. all other things being equal, I hypothesise that auditors charged higher audit fees after the global financial crisis and during the bail-in periods compared to pre-crisis and pre-bail-in periods in order to compensate for the increased risk.

The regression model indicates a positive and significant relationship between the variables of interest (POST-CRISIS and BAIL-IN) and audit fees with positive coefficients of 0.351 and 0.627 at 5% and 1% confidence levels respectively using a sample of Cypriot banks during 2000 and 2015. This suggests that auditors increased their audit fees after the economic downturn and during the bail-in period.

It is important that auditors present good reasons to their clients when charging higher audit fees. Some valid reasons are the increased audit effort and additional procedures used, more time spent on the audit planning and during the audit process, and more experienced staff employed. Furthermore, the increase in audit fees may be justified by the fact that clients are willing to accept higher audit fees during the two periods under investigation in order to make sure that the financial statements show a true and fair view both to existing and potential investors and other stakeholders. Shareholders tend to use audit fees as a measure of audit quality because there is no accepted proxy for audit quality.<sup>48</sup> Therefore, lower audit fees may indicate lower audit quality and vice-versa. As a result, this may be the reason why banks are willing to accept higher audit fees, anticipating they will receive better audit quality after the financial downturn and during the bail-in period. Additionally, macroeconomic conditions can affect the demand for audit services and eventually the pricing of these services. The findings indicate the behaviour of banks and auditors in fluctuating economic conditions.

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<sup>48</sup> A. Ferguson, C. Lennox and S. Taylor 'Audit Fee Rigidities in the Presence of Market Frictions: Evidence and Explanations' (2005) *Working Paper* (University of New South Wales, NSW; Hong Kong University of Science and Technology, Hong Kong), 1–50.

The additional test carried out in controlling the connection of Cypriot banks with Greece indicates that the GREECE variable is significant with a p-value of 0.025. This implies that the Greek economic environment affects the audit fees for Cypriot banks and Cypriot banks are exposed to the economic conditions of the Greek economy. The relationship between the GREECE variable and audit fees is negative with a coefficient value of -0.388 implying a decrease in audit fees. Therefore, it cannot be deduced that higher audit fees are charged to Cypriot banks that have operations in Greece and this may be due to the strong negotiations for lower audit fees between banks and auditors resulting from increased financial pressure.

### *7.2 Limitations and Suggestions for Future Research*

This study has some limitations. *Firstly*, the number of observations after taking into consideration unavailable data for some variables is relatively small even though the sample size is considered representative of the whole population. The sample size may have been an important obstacle in finding a trend and eventually could impact on my results.

*Secondly*, audit fees may not be considered a good direct determinant of audit effort as Schelleman and Knechel<sup>49</sup> suggest that the audit fees variable does not fully include the additional efforts required by auditors in response to increased risk levels.

*Thirdly*, there may be other factors affecting the control risk and performance of banks that have not been included in the model due to absence of data. For instance, firms may have inadequate human resources after the global financial crisis and during the bail-in periods resulting in alterations in the banks' internal control systems and eventually to changes in the level of control risk.

*Lastly*, I have not included further robustness statistical and misspecification tests in my results to confirm the reliability of the regression model due to a limited time frame.

Given my preliminary results, I would *recommend* further investigation into the following matters: *Firstly*, audit report lag can be taken into account when analysing further audit effort. Furthermore, analysis on modified opinion and going concern decision during the period 2000-2015 may be considered to help identify the

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<sup>49</sup> C. Schelleman and W.R. Knechel 'Short-Term Accruals and the Pricing and Production of Audit Services' (2010) 29(1) *Auditing: A Journal of Practice & Theory* 221–250.

effect of the global financial crisis and bail-in periods on the audit of Cypriot banks. This may lead to the enhancement of the results.

*Secondly*, the effect of merger and acquisitions on audit fees can be taken into account, as it will be useful to carry out sensitivity analysis on banks that have completed a merger. The results might be different, because following the merger of two banks audit fees being charged in the previous year may not be comparable to current year audit fees. In addition, the probability of default of each bank for each year can be included as an additional explanatory variable and identify the effect on audit fees.

*Thirdly*, the study uses total assets as a measure for the size of the client but total revenue can also be used in order to compare the results using both measures. In addition, the study uses the number of subsidiaries as a measure for complexity but other measures such as revenue diversification and dependence on interbank rate can be also used, which may lead to the enhancement of the results. Furthermore, the study uses the proportion of trade receivables to total assets but other possible measures such as the NPL ratio, volatility in the share price can also be used to identify if the results using all three measures are similar. An additional suggestion would be to use popular metrics such as ROE or ROA to capture possible losses by a bank instead of using a dummy variable, which is used in this paper.

*Finally*, further exploration could study the trend of audit fees after the global financial crisis and during the bail-in period on other financial services sub-sectors, such as the insurance industry. It would be interesting to examine the results for other financial services sectors and identify whether they are similar to the results for the banking sector.

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## Appendices

### Appendix A: Sample selection

Source: Central Bank of Cyprus

## Licensing & Supervision

Register of Credit Institutions operating in Cyprus

### 1. LOCAL AUTHORISED CREDIT INSTITUTIONS

#### A. BANKS

1. Ancofia Bank Limited
2. Bank of Cyprus Public Company Ltd
3. Cyprus Development Bank Public Company Limited (The)
4. Cyprus Popular Bank Public Co Ltd\*
5. Hellenic Bank Public Company Limited
6. Housing Finance Corporation
7. RCB BANK LTD

\*The "Cyprus Popular Bank Public Co Ltd" is currently subject to resolution. In view of the above it is prohibited from assuming any new obligations to the public in the form of deposits, securities or other evidence of debt.

#### B. COOPERATIVE CREDIT INSTITUTIONS

- I. COOPERATIVE CENTRAL BANK LTD (CENTRAL BODY OF COOPERATIVE CREDIT INSTITUTIONS)

### 2. FOREIGN AUTHORISED CREDIT INSTITUTIONS AND BRANCHES OF FOREIGN CREDIT INSTITUTIONS FROM EU MEMBER STATES OPERATING UNDER THE "EUROPEAN PASSPORT"

#### A. SUBSIDIARIES OF FOREIGN CREDIT INSTITUTIONS

##### I. SUBSIDIARIES OF FOREIGN CREDIT INSTITUTIONS FROM E.U. MEMBER STATES

1. Alpha Bank Cyprus Ltd
2. Eurobank Cyprus Ltd
3. National Bank of Greece (Cyprus) Ltd
4. Piraeus Bank (Cyprus) Ltd

##### II. SUBSIDIARIES OF FOREIGN CREDIT INSTITUTIONS FROM NON E.U. MEMBER STATES

1. Societe Generale Bank-Cyprus Limited
2. USB Bank Plc

**Appendix B: Results of the audit fee model  
after controlling connection with Greece**

<b>Variables</b>	<b>Coefficient Value</b>		<b>p-Value</b>
<b>Dependent Variable: LNAF</b>			
<b>INTERCEPT</b>	-4.853	***	0.001
<b>POST-CRISIS</b>	0.270	*	0.049
<b>BAIL-IN</b>	0.512	***	0.002
<b>LNTA</b>	0.756	***	<0.001
<b>LNSUBS</b>	0.237	***	<0.001
<b>LEV</b>	-0.002		0.130
<b>RECTA</b>	0.918		0.742
<b>LOSS</b>	0.361	***	0.003
<b>GREECE</b>	-0.388	**	0.025
<b>F-value = 88.24</b>			
<b>Adjusted R2 = 86%</b>			
<b>n = 152</b>			

\*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels respectively

**Appendix C: Results of the audit fee model  
according to companies' risk variables**

<b>Variables</b>	<b>Coefficient Value</b>		<b>p-Value</b>
<b>Dependent Variable: LNAF</b>			
INTERCEPT	-1.678		0.108
POST-CRISIS	0.361	***	0.006
BAIL-IN	0.686	***	<0.001
LNTA	0.596	***	<0.001
LNSUBS	0.334	***	<0.001
LEV	-0.002		0.210
<b>F-value = 123.77</b>			
<b>Adjusted R2 = 85%</b>			
INTERCEPT	-2.180	**	0.037
POST-CRISIS	0.425	***	0.002
BAIL-IN	0.748	***	<0.001
LNTA	0.615	***	<0.001
LNSUBS	0.328	***	<0.001
RECTA	3.504		0.208
<b>F-value = 123.79</b>			
<b>Adjusted R2 = 85%</b>			
INTERCEPT	-3.082	***	0.005
POST-CRISIS	0.310	**	0.012
BAIL-IN	0.552	***	0.001
LNTA	0.659	***	<0.001
LNSUBS	0.276	***	<0.001
LOSS	0.335	***	0.006
<b>F-value = 132.05</b>			
<b>Adjusted R2 = 86%</b>			
<b>n = 152</b>			

\*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels respectively

**Appendix D: White's heteroscedasticity test**

**White's Heteroscedasticity Test**

<b>F-statistic</b>	<b>2.667962</b>	<b>Prob. F(7,152)</b>	<b>0.0140</b>
<b>Obs*R2</b>	<b>17.05050</b>	<b>Prob. Chi-Square(7)</b>	<b>0.0171</b>
<b>Scale explained SS</b>	<b>21.32954</b>	<b>Prob. Chi-Square(7)</b>	<b>0.0033</b>

**Test Equation:**

**Dependent Variable: RESID2**

**Included Observations: 152**

<b>Variable</b>	<b>Coefficient</b>	<b>Std Error</b>	<b>t-Statistic</b>	<b>Prob.</b>
<b>C</b>	-0.952	0.456	-2.086	0.039
<b>POST-CRISIS2</b>	-0.008	0.109	-0.074	0.941
<b>BAIL-IN2</b>	0.095	0.131	0.725	0.470
<b>LNTA2</b>	0.003	0.001	2.999	0.003
<b>LNSUBS2</b>	-0.054	0.016	-3.451	0.001
<b>LEV2</b>	0.000	0.000	-0.756	0.452
<b>RECTA2</b>	-2.866	3.312	-0.865	0.389
<b>LOSS2</b>	-0.015	0.100	-0.145	0.884
<b>R2</b>	<b>0.152</b>			
<b>Adjusted R2</b>	<b>0.095</b>			
<b>S.E. of Regression</b>	<b>0.467</b>			
<b>Sum Squared Resid.</b>	<b>22.721</b>			
<b>F-statistic</b>	<b>2.668</b>			
<b>Prob. (F-statistic)</b>	<b>0.014</b>			

**Appendix E: Results of the re-run audit fee model**

**Dependent Variable: LNAF**

**Included Observations: 152**

**White's Heteroscedasticity-Consistent Standard Errors and Covariance**

<b>Variable</b>	<b>Coefficient</b>	<b>Std Error</b>	<b>t-Statistic</b>	<b>Prob.</b>
<b>C</b>	-2.580	1.031	-2.502	0.014
<b>POST-CRISIS</b>	0.369	0.124	2.977	0.004
<b>BAIL-IN</b>	0.696	0.143	4.861	0.000
<b>LNTA</b>	0.633	0.052	12.111	0.000
<b>LNSUBS</b>	0.268	0.059	4.521	0.000
<b>LEV</b>	0.000	0.000	2.742	0.007
<b>RECTA</b>	1.507	0.592	2.547	0.012
<b>LOSS</b>	0.246	0.104	2.358	0.020
<b>R2</b>	<b>0.869</b>			
<b>Adjusted R2</b>	<b>0.861</b>			
<b>S.E. of Regression</b>	<b>0.556</b>			
<b>Sum Squared Resid.</b>	<b>32.164</b>			
<b>F-statistic</b>	<b>98.861</b>			
<b>Prob. (F-statistic)</b>	<b>0.000</b>			