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**THE IMPACTS OF STRICTER BANK SUPERVISIONS
AND REGULATIONS ON EXTERNAL AUDIT
IN THE EUROPEAN BANKING SYSTEM**

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ABSTRACT OF THE MASTER'S THESIS

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Title The impacts of stricter bank supervisions and regulations on external audit in the European banking system			
Subject Financial and Management Accounting	Type of the degree Master's Thesis	Time of publication July 2020	Number of pages 68
Abstract <p>Perceiving that banking regulations and supervisions might not only exacerbate managerial discretions at financial institutions, but also render the estimates on bank exposures more complicated, it is probable that the governmental interventions could have repercussions for the quality of audited accounting information or the quality of external audit. Motivated by this dispute, the research, via full-sample panel-data analysis, aims to answer the questions of whether and how the implementations of international banking regulations and supervisions have influenced the quality of external audit in the EU banking system from 2001 to 2019. In addition, the research also seeks to discover the impact of the Single Supervisory Mechanism (SSM) in the European banking system by carrying out difference-in-difference estimations between significantly and less significantly supervised banks, as well as sub-sample panel-data estimations to measure the effect on audit quality. The research finds that the EU's stringency in capital regulations has adversely affected audited information's quality and made auditing costs less effective regarding LLPs. However, the capital requirements in Basel III have proved effective and moderately helpful in increasing audited information's quality. Other findings show that for most of the factors influencing external audit's quality, there were differences between the two groups of banks and that the SSM scheme has helped improve external audit's quality by constraining discretionary capital practices at the significant banks, despite also making both audit and non-audit services less effective in improving audited information's quality. The findings suggest that for both groups of banks, having their providers of both audit and non-audit services under governmental supervision might be beneficial, given that this costs less than direct supervision from the ECB.</p>			
Keywords Single Supervisory Mechanism, Basel Accords, loan loss provisions			
Additional information			

1 INTRODUCTION

Despite appearing a long time ago in all ancient countries, external audit has only been conceptualised since the Industrial Revolution around 1780, in which the development of complex business structures was seeking for external-financing funds and demanding the disengagement of capital facilities and management. However, the objectives of external audit, along with its roles, have never reached a universal consensus, instead being constantly evolving under the influences of academic theorisations and contextual events. The evolution has provided a variety of notions about the functions of external audit, and even more divergently so since the emergence of financial regulations from a free market system in the financial industry. Therefore, it is of great necessity to foremost provide a theoretical and practical background to the conception of external audit, together with a review of banking regulations and supervisions, before suggesting contemporary and considerable matters of how the nature of external audit performs in the financial sector under the process of international banking regulations and supervisions, over the course of the introductory section. These concerns will in turn pose this research's main objective of assessing the regulatory and supervisory development's impact on the performance of external audit in the European banking system, thereby throwing a brighter light on the quality of external audit performed in the banking industry – a regulated market. Understanding the influences on external audit will not only assist the regulators in pursuing proper interventions, but also clear the doubt about regulators' role in producing and allocating financial information.

1.1 Background

1.1.1. The theoretical role of external audit

The public perceptions. The concept of auditing has only been methodically theorised through academic research since the 1920's, as opposed to simply being shaped by public perceptions before that. Indeed, long before the 20th century, the perception of auditing was dominated by the Policeman Theory, a basic public notion, in which the role of auditing is deemed to be analogous to a policeman's job of preventing and detecting fraud, differing only through focusing on arithmetical accuracy (Hayes et al.,

2005, p. 44). By contrast, under the Lending Credit Theory – another public perception, auditing was primarily introduced to provide credibility to financial statements being used to enhance the stakeholders’ trust in management stewardship (Hayes et al., 2005, p. 45). The latter public belief can be marked as a transition in the theoretical objectives of auditing, from principally being fraud detection and prevention to significantly being verification of financial statements’ truth and fairness, as claimed by the succeeding theories proposed in academic research, such as the Theory of Inspired Confidence (Limperg, 1932) and Agency Theory (Watts & Zimmerman, 1979).

The initial academic conceptions. These successive notions were primarily concerned about determining the quality of financial information to reduce the problem of information asymmetry between management and stakeholders. However, different from the public perception, both these theories viewed the role of auditing systematically through both perspectives of supply and demand sides in an audit-service market. More specifically, the theories addressed that the demand for audit services came from the demand of outside stakeholders for receiving fair and true view on financial information to monitor management. Meanwhile, on the supply side, the auditors were considered as a “confidential agent of the community”, obligated to fulfil the outsiders’ reasonable expectations, by Limperg (1932), but a mediator, bound by the shareholders (and creditors) to reduce agency costs, between managers (agents) and stakeholders (principals) from the perspectives of Watts & Zimmerman (1979). In addition, similar to the Lending Credit theory, the Agency Theory pointed out that the agents also had the willingness to contract to supply audited financial statements since their welfare was decided by the principals, who required reliable reports on how the agents operated the corporations to pursue the principals’ interests. It is manifest that although all aforementioned theories generally advocated the origin of auditing from the contractual arrangement between stakeholders and managers, the Agency Theory might be the one providing the most sufficient explanation about the role of auditing from both perspectives of the supply and demand sides.

The theoretical explanations from the Agency Theory’s perspective. As a matter of fact, starting from the late 20th century, the notion of agency theory has been prominently used to discuss the role of auditing further. More particularly, drawing on

the contractual relationship of principal-agent, Wallace (1980) developed three hypotheses for “the economic role of the audit in free and regulated markets”. Through discussing the monitoring hypothesis, the information hypothesis, and the insurance hypothesis, the study aimed to provide a theoretical framework for the function of audit in different environments. Under the assumption that the principals never trusted the financial numbers reported by their agents, thus insisting on adjusting the agents’ income for perceived risks of losses, the first hypothesis advocated that the agents would willingly be checked to provide evidence that the reported information were cautiously prepared to avoid accidental and material misstatement errors, when the benefits from these monitoring activities exceeded the related costs. Supporting this hypothesis, the empirical studies of Chow (1977, 1982) showed that the probability of a firm’s voluntariness of hiring external auditing would increase with firm size, leverage, and number of accounting-based debt covenants to presumably indicate the stewardship responsibility of management to creditors and shareholders, as well as with the total number of employees to presumably indicate the stewardship responsibility of lower management to higher management. The evidence implied that the main stakeholders were inclined to consider the monitoring capability of an audit as a valued control mechanism.

Meanwhile, the information hypothesis emphasised the role of audit in enhancing the quality of financial information, thereby reducing investment risks, facilitating internal and external decision-making, as well as improving earnings from trading and portfolio investment positions. Although being considered as an alternative to the former hypothesis, this hypothesis believed that regardless of whether or not the agent explicitly contracted with the principal to provide audited financial information, the demand for those pieces of information to estimate market values and to support rational investment decisions still existed. Indeed, a great deal of empirical studies, such as Beaver (1968) and Collins (1976), found that the information on financial results had value as they could either create abnormal trading gain under the circumstance of information asymmetries, or provide clarification of some uncertainties, thereby reinforcing the trust of outside investors under the condition of efficient markets. It is questionable whether the government should impose mandatory disclosure regulations on corporations to achieve the desired level of information production or let the market mechanism correct the failure of inefficiencies to reach

the target. Wallace (1980) argued for the freed-up mechanism against the intervened one, not only because a corporation could increase the level of disclosure based on the demand for product by non-stockholders just as a regulator could, but also because there were no guarantees that the result of the governmental intervention might be preferable to the market expectation.

The last hypothesis took the management's liability exposure as an explanation of how managers decided whether to contract with an audit. In light of the insurance hypothesis, the agent was prone to shifting the responsibility for reporting data to an audit with the aim of lowering the expected losses from litigation or related settlements. Wallace (1980) also expressed that "investment bankers, trustees, underwriters, lawyers, and managers who have professional liability exposure for their participation in financial activities involving disclosure practices have incentives to insure themselves via auditors' participation". Therefore, it is reasonable to agree that the demand for an audit could stem from an increase in the need for insurance against potential litigation facing the management. Notwithstanding the overlaps with the two previous hypotheses in terms of considering an audit as a method of settling for discretionary practices of the agent, the insurance hypothesis was more capable of justifying the irreplaceable roles of an audit by the explanation for why the agent would not contract with an insurance company but an auditor. More particularly, an auditor not only provided professional and independent attestation, the specialised knowledge of disclosure problems, and the service of defending against liability suits, but also shared the common concern about reputation with the managers, as well as supporting in socialising business risk to the society through higher fees (Wallace, 1980). In alignment with the insurance hypothesis, Menon et al. (1994) provided an empirical evidence that auditors were deemed guarantors of the quality of financial information from Laventhol & Horwath clients, whilst another evidence from UK publicly quoted companies, given by Lennox (1999), illustrated that the larger the auditors were, the more likely they were liable to litigation.

Going beyond the discussion on the economic role of audit in an unregulated environment, Wallace (1980) also shed new light on the effects of regulations on the market for auditing services. From his viewpoint, governmental interventions were set out to improve resource allocation through not only mitigating the opportunities to

exploit inside information and the unnecessary duplication of efforts, but also resolving the “free-rider” or information non-purchasers problem and the information asymmetry issue. Nevertheless, there was no assurance that the regulatory mechanism which aimed to achieve optimal information production decisions and to efficiently disseminate the produced information was better than the mechanism of the free market in which voluntary participations, assessments of the auditing costs, and auditing procedures would be driven by the monitoring, information, and insurance benefits, thus resulting in an expected allocation of resources. However, it is worth pointing out that the regulators’ self-interest in collecting information useful to them in performing their responsibilities was another reason for adopting a regulatory mechanism (Wallace, 1980), as it could imply that external audit also played a supporting role in the governmental oversight of more regulated sectors such as financial institutions.

1.1.2. The practical role of external audit in the banking system

Despite having different approaches to explaining the role of external audit, the conventional theories all promoted its importance to the mitigation of the principal-agent problems, and undoubtedly considered the external audit as an independent mediator, who was supposed to furnish the users of financial information with true and fair views on corporations’ performance in general and managers’ in particular. In addition, it is manifest that these theories neither mentioned how the external audit and its responsibility should change in regulatory environments, nor completely approved of the governmental interventions in the process of information production.

The practical evidence for the importance of external audit. In fact, the Savings and Loan crisis in 1980s, which led to an economic recession, initially revealed that the external audit should have been obligatory with the aim of deterring against corporate abuse, as the US Government Accountability Office (GAO, 1991) reported that 4 of the 39 failed banks during the crisis had never been audited, 23 of those had not been audited yet since the previous year, and 6 of these 23 banks had not been audited since the last two years before the collapse. However, it has never implied that the independence and objectivity of the external audit, as well as the creditability of

audited financial information, would be always reserved without further state interventions and supervision.

The failures of external audit. Indeed, the affair of the Johnson Matthey Bankers Limited in 1984 forced the Bank of England to require the external audit to disclose issues of concerns, rather than preserving the duty of confidentiality between auditors and clients (Singh, 2007, p. 155). Meanwhile, the fraudulence of Bank of Credit and Commerce International (BCCI) in 1991 was a strong attestation of an abdication of the external audit's responsibility resting with the shareholders and the regulators, since whilst taking the role of an auditor for the bank, Price Waterhouse also gave an advice on accounting practices to support the bank in transferring treasury activities from the United Kingdom to Abu Dhabi and claiming a terminal loss to avoid tax liabilities (Singh, 2007, p. 156). As a result, a treasury loss of nearly 500 million US dollars, the equivalent of BCCI's entire capitalisation (Brown & Kerry, 2011, p. 252), had been concealed as its treasury business was outside the remit of the Bank of England. Moreover, from the review of JDS tribunal in 2006, the external auditor, Price Waterhouse Coopers (PWC), failed to unveil BCCI's ways of managing its performance in the annual audited reports, as PWC was incapable of not only disclosing the owner and lender relation of BCCI to ICIC Group, but also assessing whether the loan loss provisions reflected the level of lending and non-performing loans (Singh, 2007, p. 162). The conflict of interests between the auditing duties and the non-auditing duties became manifest after the bankruptcy of Barings Bank in 1995. Deloitte & Touche (D&T), the external auditor of Barings Bank, was negligent in not investigating the anomalies of the 88888 account, which Leeson created to hide the losses of unauthorised trading, as well as the issues of margin payments, the negligence contributing the collapse of Barings Bank (Singh, 2007, p. 167). It is of great importance to highlight the decision of the court against D&T for the damages to Barings Bank between 1992 and 1995, as D&T was only excused partially from liability and its negligence was deemed more of a technical and minor nature of auditing, the decision implying that the external audit is not an insurance against corporation losses, in contrast to the insurance theory.

The trigger for the governmental interventions. In spite of the failures of auditors in the banking industry, there has been no official prohibition of providing non-audit

work to the audit client to improve the external auditors' independence and to reduce overfamiliarity. One more time, the creditability of audited financial information has been doubted, this time even more highly, since the start of the global financial crisis and over the past decade, as they failed to report problems relating to bank assets, liabilities, risks and economic exposures in the distressed financial institutions' balance sheets. Indeed, in the UK, the US, Germany, Iceland, The Netherlands, France, and Switzerland, there were 28 distressed financial institutions, which were publicly declared to have financial difficulties requiring state bailouts, although they had just received unqualified audit opinions provided by either one of the Big Four accounting firms in exchange for high audit fees (Sikka, 2009). In addition, most of these banks had also received non-auditing services from their auditors with noticeably high fees, thus leading to a doubt on audit independence (Sikka, 2009). This is not to mention that, in the context of the implementing of a new set of international banking regulations (based on Basel II) and the emerging financial instruments or derivatives in developed countries at this time, the recognitions of bank assets and liabilities on balance sheets, which were the bases for calculating banks' risk exposures, had been becoming more and more complicated and difficult, the complexity to some extent motivating managerial discretion in capital level and earning management through loan loss provision accounts. The XIX Congreso Nacional de Auditoria questioned the failure of audit processes in detecting weaknesses in risk assessing and measuring (Ramos, 2010). Therefore, it is undeniable that the issuing of subjective and misstating audit reports was one of the most decisive causes of the sudden financial crisis, which happened without any earlier warnings, thus damaging the interests of banks' customers, especially depositors. The erosion of external audit quality and independence called for the in-depth integration of alternative institutional arrangements into auditing financial institutions, the arrangements directly conducted by statutory regulators who have the legal authority to force their financial institutions into abiding by their regulations on banking operations.

However, this does not mean that the duties of the external audit would be superseded by the role of banking supervisors, or that these two parties' concerns would overlap rather than being complementary to each other, despite being related to the same matters. Indeed, Article 82, Principle 6, BCBS280 (2014) states that, "in order to discharge their respective statutory responsibilities, neither party should use the work

of the other as a substitute for its own work and the supervised entity should remain the main source of information for their respective work.” It is of great importance to highlight that, different from the guidelines of BCBS87 (2002) emphasising the aspects which banking supervisors should be concerned about when using audited financial statements in their supervisory activities, the current guidelines of BCBS280 (2014) focus on encouraging indirect communications between external auditors and supervisors on significant matters relating to financial reporting, as well as mandatory direct communications between these two parties on extended audit reports covering assignments regarding prudential supervisory requirements. Not only is it manifest that the process of the external audit for banks would be overseen by banking supervisors, but it also seems that the scope of the external audit would go beyond the assurance of financial statements in order to extend and meet supervisory requirements.

1.1.3. The international banking regulations and supervisions

Considered as a response to the 1980’s banking crisis, the foundation of Basel Committee on Banking Supervision (BCBS) was agreed by the central banks’ regulatory authorities and governors from the Group of Ten countries (G10), with a commission to strengthen financial liability through implementing the unified regulation and supervision standards, known as Basel Accords, in the banking systems at the international scale.

Basel I. As the foundation stone of this standardisation, Basel I or the Basel Capital Accord, put forth in 1988, required commercial banks to keep the regulatory capital amounting to at least 8% of their risk-weighted assets (BCBS, 1988). Particularly, Basel I limited general loan loss reserves included in Tier 2 capital to be 1.25% of risk-weighted assets. This 1.25% requirement was met by banks in the US, whilst other countries’ bank regulators also had the freedom to go over this threshold in accordance with the perceived regulatory need of their own countries’ banking system. The requirement could generate a motivation for raising the loan loss provision (LLP) estimates to satisfy the regulatory level of capital. Furthermore, Basel I did not take into account the possible changes in the borrow categories’ creditworthiness during the loan facility’s life span, whereas in fact, the LLP estimates for the categories were risk-adjusted on a continuous basis to cope up with the borrowers’ changes in

creditworthiness, not to mention applying the fixed risk weights for all categories of different borrowers, such as individuals and corporations. As a result, the LLP estimates became backward-looking and procyclical, as the banks had insufficient LLPs and regulatory capital requirements (Bikker & Hu, 2002; Danielsson et al., 2001). Besides, according to Jackson et al. (1999), another criticism was that Basel I was procyclical with changing economic conditions, due to the fact that banks would try to decrease lending (and other risky activities) during difficult periods in order to preserve a lesser amount of regulatory capital. This practice was deemed unacceptable by bank regulators, who wished the banks to maintain higher capital buffers during difficult periods, since it would prompt banks to overstate their specific reserves in an attempt to make up for their low regulatory capital ratio. This would in turn lead to more procyclicality in the financial system, since bank profit was reduced even further when provisions were exceedingly increased (Ahmed et al., 1999; Borio et al., 2001, pp. 1-57; Cavallo & Majnoni, 2002, pp. 319-342). Bikker & Metzmakers (2005) also agreed that in the scenario of a prolonged financial recession, with increased LLPs came decreased bank profit, depleted bank capital and more severe recession. Consequently, the Basel I capital standard needed a revision.

Basel II. According to BCBS (2004), Basel I was revised into Basel II and enacted in the Group of Ten countries, with the main purpose of instigating a new and more risk-sensitive methodology of determining the required amount of minimum capital in order to absorb losses (and credit losses in particular). There were three building pillars that Basel II was based on: minimum capital requirements, regulatory supervision, and market discipline (BCBS, 2004). Amongst these, Pillar 1 detailed the methodology to determine the requirement for minimum capital, keeping it at 8% of risk-weighted assets, albeit requiring the coverage of market risks and operation risks in the capital adequacy ratio, as well as a significant modification in the way of classifying assets and measuring their risks, thus implying a more stringent regulatory capital ratio than in Basel I. Particularly, there were three approaches to determining this minimum requirement for banks: the internal rating-based (IRB) approach, the standardised approach (SA) and the advanced measurement approach. In the first approach, IRB, banks were required to carry out their own credit risk assessment of the borrowers to come up with their corresponding risk weights, and were supposed to make sure that their LLRs were able to fully cover the expected losses. In the case the eligible reserves

could not, the differences had to be deducted from Tier 1 and Tier 2 capital (50% each). In the other case when the expected losses were less than the eligible reserves, the difference should be recognised in Tier 2 capital, but not more than 0.6% of the risk-weighted assets. Meanwhile, in the second approach, banks were supposed to base their risk weights on external credit ratings and also to reserve at maximum of 1.25% of the risk-weighted assets for loan loss provisions. Lastly, the advanced measurement approach let banks pick a methodology of risk assessment for their own, as long as it was comprehensive and systemic enough. In general, Pillar 1 of Basel II served the purpose of making sure that unexpected losses were covered by bank capital, and expected losses were covered by loan loss reserves (Majnoni et al., 2004). However, Basel II still could not escape the criticism for being procyclical regarding fluctuating economic conditions, according to Turner (2000), Borio et al. (2001, pp. 1-57), Danielsson et al. (2001), Segoviano and Lowe (2002), Repullo et al. (2010).

Basel III. Basel III (BCBS, 2010) called for the full introduction in June 2018 of the system for loan loss provisioning called ‘through-the-cycle’, which was similar to Basel II in the way it anticipated loan losses before they materialised. The difference was that Basel II allowed provisioning at only a certain point in time (e.g. the beginning of the year, quarterly, semi-annually, etc.), which was also the main reason for its criticism from Hull (2012) and Wezel et al. (2012). Improving on this, Basel III has brought about a provisioning system demanding banks (as well as other financial institutions) to reserve specific provisions for newly-originated loans, following characteristics specific to the individual borrowers and determine the loan’s performance (Wezel et al., 2012). In other words, each specific loan will be determined a corresponding level of LLPs, basing on a number of criteria specific to each bank and each borrower, even if the loan has not been impaired or the likelihood for such impairment in the future is low (Wezel et al., 2012). Basel III enables banks to improve their LLP estimates’ quality firstly by increasing the quality of the data generating provisions buffers, and secondly by instigating the so-called ‘through-the-cycle’ LLP estimates. Through the first mechanism, in addition to being able to obtain collateral data with optimal quality, banks are free from the flaws in existing LLP processes and models, particularly the ones leading to too high or low buffers. This results in more space for discretionary practices in provisions for each category, thus helping reduce the difference between provisioning and expected losses. In the meantime, the second

mechanism warrants that for banks which adopt the ‘through-the-cycle’ approach with respect to estimates of probability of default (PD) and expected losses (EL), their LLP estimates can have higher accuracy and less volatility. According to (Wezel et al., 2012), a significant amount of discretion will be retained by banks in determining LLP estimates and following this, bank managers are expected to make sure that the applying of Basel III standards is backed up by solid risk management considerations. It is claimed that this provisioning system (i.e. the ‘through-the-cycle’ system) is better in anticipating loan losses, whilst also aligning with the principles of Basel II (Angelini et al., 2015; Blundell-Wignall & Atkinson, 2010). However, it should be noted that since each bank’s situation is different from each other, there is not likely to be an approach in implementing this new provisioning model that can be ideal and fit all banks. Specifically, the banks’ numbers and kinds of applicable levers may vary from each other, corresponding to their asset composition, proportion of securitised assets, etc., and also to whether they have applied the measures introduced by Basel III even before the official implementation date 1st January 2022.

1.1.4. The context of the banking regulations and supervisions in European Union Area

Considering the development of banking regulations in the European Union (EU) banking system, it started with the implementing of the Basel Capital Accord, known as Basel I, through the issuing of Capital Adequacy Directive (93/6/EEC). However, the CAD did not require the EU banks to limit their loan loss reserve to be 1.25% of risk-weighted assets. This directive was replaced by Capital Requirement Directives I (2006/48/EC and 2006/49/EC), Capital Requirement Directives II (2009/111/EC, 2009/27/EC, and 2009/83/EC), and Capital Requirement Directive III (2010/76/EU), the CRDs considered as the implementation of Basel II in the European banking system with a Single Market context.

Directly imposed on both credit institutions and investment firms, these directives required financial institutions to assure the adequacy of their internal capital, with respect of quantity, quality, and distribution. In light with Basel II, the Article 57 Directive (2006/48/EC) obligated financial institutions in Member States to ensure the minimum level of bank capital at 8% of their amounts of risk-weighted exposures not

only to credit risks as required in CAD, but also to operational and market risks. The CRDs also differentiated between original own funds and additional own funds through setting the limits on the amount of additional own funds and on their certain items not to exceed respectively 100% and 50% of the original own funds in Paragraph 30 and Article 66 Directive (2006/48/EC). According to Article 57 Directive (2006/48/EC), original own funds consisted of paid-up capital, reserves, retained earnings and funds for general banking risks, whilst the latter funds comprised revaluation reserves, value adjustments, and subordinated term debt. It is worth noting that although considered as items of additional own funds with the lower quality, revaluation reserves and value adjustments were still expected to be available for unrestricted and immediate utilisation in covering risks or losses, along with the items of original own funds, in accordance with Article 61 Directive (2006/48/EC). In light with the Directive, Committee of European Banking Supervisors (CEBS, 2006) emphasised three key prudential criteria for the assessment on capital's eligibility for being original own funds: permanence, capability of fully absorbing losses, and payment flexibility as to the amount and timing distributions, together with being issued and fully paid-in.

In alignment with Basel II, these directives also instructed the three methods, the Standardised Approach, the Basic Internal Rating-Based Approach, and the Advanced Internal Rating-Based Approach. Whilst the first method required banks to rely on external rating agencies, certified by their supervisors, to assign risk weights to their claims, the second and third ones allowed banks to use their own risk assessments. In the CRDs, it is noticeable that under the Standardised Approach, the specific limit of 1.25% of risk-weighted exposure amounts on loan loss reserves as banks' own capital had not still been decreed. However, under the Internal Rating-Based Approaches, if the subtractions of the expected loss amounts from the sum of value adjustment and provision resulted in negative amounts, the difference would be deducted from the own funds (but this is still up to the discretion of the Member States), according to Article 61 Directive (2006/48/EC); on the contrary, if the result was positive, the difference would be added into the own funds but the added amounts must not exceed 0.6% of risk-weighted exposure amounts, according to Article 63 Directive (2006/48/EC).

Nevertheless, the deficiencies of the new capital framework, revealed during the financial crisis, still existed, thus leading to the demand for replacement. Since 2013, Capital Requirement Directive IV (2013/36/EU), together with Capital Requirement Regulation (EU) No 575/2013, drawing on Basel III, has been adopted to replace the previous directives. More specifically, the Regulation re-defined the concept of own funds, together with demanding stricter own funds requirements, in order to enhance the quality of capital with a better capability of absorbing losses, whilst the Directive IV introduced capital conservation and countercyclical capital buffers, with the aim of mitigating the procyclical effects of financial regulation.

According to the CRR, Tier 1 capital, which would be comprised of Common Equity Tier 1 (CET1) and Additional Tier 1 (AT1), shall combine with Tier 2 capital to form the own funds of an institution. Although the minimum requirement for the own funds has still been maintained at 8% of the total risk-weighted assets, financial institutions must be obligated to ensure the specific requirements for Tier 1 capital at 6% and CET1 at 4.5%, under Article 92 Regulation (EU) No 575/2013, together with the capital conservation buffer of CET1 at 2.5% and the countercyclical capital buffer designated between 0% and 2.5%, under respectively Article 129 and Article 136 Directive (2013/36/EU). It should be stressed that notwithstanding that retained earnings, in addition to paid-in shareholder capital, shall be recognised as one of the main items of CET1, interim and year-end profits shall only be included in CET1 when those profits have been verified by independent auditors, and the deductions of any foreseeable charge or dividend from those profits have been demonstrated persuasively to the competent authority (Paragraph 2 of Article 26 Regulation (EU) No 575/2013). Nevertheless, it is expected that these requirements could influence the discretionary decisions of financial institutions on provisioning loan losses in favour of the enhancement of retained earnings. This is not to mention that the discretionary tendency could also be induced by the limits on the amounts of general credit risk value adjustments (general loan loss reserves), which not only have been regulated under the Internal Rating-Based Approach since the previous directives, but also shall be available under the Standardise Approach with a maximum of 1.25% of risk-weighted exposure, according to Article 62 Regulation (EU) No 575/2013.

In addition, aligning with Basel III, the Commission Delegated Regulation (EU) No 183/2014 (or Regulation Technical Standards), the supplement to Regulation (EU) No 575/2013, again emphasised that general credit risk adjustments must be freely available to cover subsequently materialised losses in respect of timing and amount, i.e., general loan loss reserves taken as the own funds must hold against future, presently unidentified losses, or at least a gone-concern basis, stemming from credit risks which have not been materialised yet. Simultaneously, general credit risk adjustments must be capable of reflecting credit risk losses from a group of exposures with no current evidence for the occurrence of a loss event (Article 1 (2b) Regulation (EU) No 183/2014). Based on these two criteria, general credit risk adjustments would be distinguished from specific credit risk adjustments, which would be ineligible to be included in the own funds under the Standardised Approach, and would be to some extent included under the Internal Rating-Based Approaches, in accordance with Regulation (EU) No 575/2013. What is more, following the framework of Basel III, the Regulations also required that financial institution must identify a level of specific credit risk adjustments for each type of exposure or a single obligor.

To sum up, the stringency in the development of EU banking regulations has been undeniable, as financial institutions have been obligated to improve their capital levels in terms of both quality and quantity gradually. Although the minimum regulatory capital ratio has been set at 8%, the requirements for the calculation of this ratio have become stricter and stricter. It must be stressed that notwithstanding that the requirements aims to enhance the credibility and capability of loss-absorbing capital, they have still provided spaces for managerial discretions as financial institution could use their own assessment on measuring and classifying risks. The changes in the European banking legislations are summarised in Table 1.1.4, together with the judgments on their influences on loan loss provisioning practices.

Table 1. Summary of the development of banking regulations in the EU banking system

Before 2005 Capital Adequacy Directive (Basel I)	
<p>CAR = 8%</p> <ul style="list-style-type: none"> • Only covering credit risks • Based on the regulatory classification of bank assets, corresponding to different risk weights • Applying the fixed set of risk weights for all categories of different borrowers • No adjustment in the borrow categories' creditworthiness during the loan facility's life <p>Loan loss reserves:</p> <ul style="list-style-type: none"> • Backward-looking and procyclical loan loss provisions estimates • Included in the calculation of CAR, without restriction 	<ul style="list-style-type: none"> ➤ Putting pressure on banks, especially low capitalised ones, to satisfy the capital requirements, thus probably inducing capital managements through provisioning loan losses as there was no restriction on the inclusion of loan loss reserves.
2006 – 2012 CRD I, CRD II, and CRD III (Basel II)	
<p>CAR = 8%</p> <ul style="list-style-type: none"> • Covering credit risks, market risks and operational risk • Modifying assets classification and risk assessment through Internal Ratings-Based Approaches (IRB) (using banks' own risk assessments) or Standardised Approach (SA) (using certified external rating agencies' assessments) <p>The own funds:</p> <ul style="list-style-type: none"> • The difference between original own funds and additional own funds <p>Loan loss reserves:</p> <ul style="list-style-type: none"> • Ensuring the full coverage of expected losses • Under Standardised Approach: no specific limit on the inclusion of loan loss reserves in banks' own capital • Under IRB Approaches: deducting the negative amount (from the subtractions of the expected loss amounts from loan loss reserves) from the own funds; adding the positive amount up to 0.6% of risk-weighted exposures 	<ul style="list-style-type: none"> ➤ Still imposing the challenge of CAR at 8% because of the requirements of covering operational and market risks, in addition to credit risk, and constraining on additional own funds whose quality is considered lower than that of original own funds ➤ Not limiting on the inclusion of loan loss reserves but requiring the risk assessments to be based on the external assessments on risks, under the Standardised Approach ➤ Still giving the space for managerial discretions as the risk assessments are conducted by banks under IRB Approaches, though the approaches have constraints on the inclusion of loan loss reserves ➤ Thus, deterring EU banks from the capital management in favour of loan loss provisions, but not of earnings.
2013 – 2019 onwards: CRD IV and CRR (Basel III)	
<p>CAR = 8%:</p> <ul style="list-style-type: none"> • Tier 1 Capital = 6% • CET1 = 4.5% • Capital Conservation Buffer = 2.5% • Countercyclical Capital Buffer designated between 0% and 2.5% by the authority • Requiring the verification of interim and year-end profits before including those profits in CET1, and the persuasive demonstration of deducting any foreseeable charge or dividend from those profits 	<ul style="list-style-type: none"> ➤ Still resting with ECB to satisfying with the CAR at 8% because of the requirements of the quality of capital sources ➤ Requiring the assessment on the credibility and availability of interim and year-end profit before the inclusion in the own funds

<p>Loan loss reserves:</p> <ul style="list-style-type: none"> • Distinguishing general loan loss reserves from specific loan loss reserves • Applying specific loan loss reserves for each type of exposure or a single obligor • Under Standardised Approach: the specific limit of 1.25% on the inclusion of general loan loss reserves in banks' own capital; the exclusion of specific loan loss reserves from the own capital • Under IRB Approaches: deducting the negative amount (from the subtractions of the expected loss amounts from general and specific loan loss reserves) from the own funds; adding the positive amount up to 0.6% of risk-weighted exposures; including specific loan loss reserves in the own funds to some extent 	<ul style="list-style-type: none"> ➤ Giving space for discretions regarding specific loan loss reserves, though limiting on the inclusion of loan loss reserves, under both approaches ➤ Attempting to discourage EU banks from the capital management both in favour of loan loss provisions and earnings.
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As regards which governmental organisation in each country should be responsible for banking supervisions and regulations, it is conventional that the central bank will play the supervisory and regulatory roles, as it possesses the monetary authority. The story was different for Eurozone countries, as the central banks of which, despite still having the responsibility for overseeing their financial institutions, did not own the monetary authority, which instead was owned by the European Central Bank (ECB). During the development of the global financial crisis, many distressed European banks needed the financial support from their central banks, which had no control over the Euro currency to conduct quantitative easing. This led to a sovereign debt problem, along with a contractionary fiscal policy followed by economic recessions, as the national central banks borrowed money from the ECB to bail out their financial institutions. More importantly, “due to the interconnected nature of modern financial systems, one country rapidly spilled over national borders, causing financial distress in other EU countries” (European Court of Auditors, 2016), not to mention that cross-border flows of goods, services, capital and labour amongst European Union member states made the national economic recessions become the downturn of the whole European market. Therefore, it was only after the aftermath of the financial crisis had happened to reveal the deficiency in the institutional architecture of the European economic and monetary union, in which despite sharing a single market, there were no common supervision and regulation for European banks, that the establishment of a European banking union was introduced in 2012. Following that, the Single Supervisory Mechanism (SSM), comprising the European Central Bank and the national supervisory authorities (NSA),

was introduced in 2013 and has been operating as the single supervisor of all financial institutions in participating European Union (EU) Member States since 2014. More specifically, all financial institutions in EU countries have been obligated to participate in the SSM, whilst it is voluntary for non-eurozone EU Member States to be participants.

1.2 Research problem

In the context of more integration of the supervisory arrangements for auditing the banks, more stringency of the regulatory requirements for the EU banking system and more complexity in banks' exposure estimates, external auditors have been put under increasing pressure, as they are required to not only satisfy the regulatory supervisors' requirements for the out-of-statutory-audit scope, but also understand the new complicated and varied internal assessment systems for classifying assets and measuring risks for asset portfolios. The complication has provided banks' managers more space for earnings management, thus raising the risk of material misstatements on bank assets for external auditing, whilst the stringency can motivate them to practice capital management. For instance, recognising less amounts of loan loss provisions increases reported earnings, which is a part of the numerator of capital adequacy ratios. Simultaneously, it can heighten capital adequacy ratios, when current loan loss reserves included in the capital level reaches the limit level. Otherwise, banks' managers can recognise more amounts of loan loss provisions to enhance reported regulatory capital, when the unproportionate reduction on retained earnings (due to tax deduction) is smaller than the provision amount included in the capital level. Thereby, both these practices are influenced the informativeness of financial statements, as well as the quality of accounting data. If such managers' discretions cannot be detected and corrected by external auditors, irrespective of what the reason is, either the complexity not met by adding more audit efforts or the persuasion of the bank managers, the audited consolidated financial statements will become incapable of reflecting the financial difficulties of the audited banks. Indeed, the review of the practical roles of external audit illustrated the consecutive failures of the external audit as an independent mediator between managers and stakeholders through alleviating the asymmetric problem.

Therefore, the practical context is open to dispute whether stricter banking regulations and supervisions for the EU banking system would have favourable or unfavourable impacts on external audit's quality of reported loan loss provisions. A reasonable answer for this question will also contribute an evidence for the needs of governmental interventions to control the creditability of financial information provided by the external audit (in other words, whether the responsibility of external audit towards the users of financial statements should be in control of the regulators). With the purposes of assessing the impact of banking regulations and supervisions on external audit in the EU banking system, the study will seek to answer three questions as follows:

1. How did banking regulations and supervisions of the European Central Bank affect the performance of external audit?
2. To what extent was the performance of external audit improved as capital and earnings management practices were alleviated by stringent banking regulations and supervisions in the European banking system?
3. Were there differences in the effect on the performance of external audit through increasing external audit efforts due to the different degrees of the European Central Bank's oversight?

The current paper will follow this order: Chapter 2 introduces a theoretical and empirical review of related current literature, Chapter 3 conveys the research methodology, including the data description and estimation approach, whilst Chapter 4 examines the estimations' results and Chapter 5 delivers the conclusions.

2 LITERATURE REVIEW

2.1 Introduction

With the purpose of reinforcing the resilience of banks to financial slumps, banking regulations and supervisions have been heightened; however, the stringency could induce managerial discretions, thus giving more challenge for external audit. On the other hand, the state intervention in information production and allocation could help improve the audit quality through supervising the process of external auditing and giving external audit parties an authority to access more information of banks. This paper will initially bring about a review of the current literature regarding the audit quality, in order to point out which proxy should be used to measure the quality of external audit and the rationale behind that. Furthermore, the literature review will illustrate the linkage between the conventional proxy of audit quality with the discretionary practices of capital and earnings managements, to highlight why the proxy is a matter to indicate the performance of external audit. Last but not least, it is important to view the current studies providing evidence of the regulatory impacts on the performance of external audit.

2.2 The quality of external audit

Since current literature did not seem to have an agreement regarding a measure representative for audit quality, the quality of audited financial statements was turned to for this purpose. The behind reasoning was that they could be linked to audit quality, as in the case management produced information with some material distortions in it, these distortions would be corrected by the auditors. It is advisable to suggest that audit quality could be reflected via a measure indicating the quality of accounting information.

Standing at this viewpoint, the detection of management practices through discretionary accruals can be taken as a benchmark for the performance of external audit, as the role of external audit is defined as an intermediate information examination forestalling opportunistic manipulation of the management, thus disclosing true and fair views on financial information. There were ample studies

utilising this proxy to indicate audit quality related to the information of earnings, such as Heninger (2001), Dang (2004), Bedard and Johnstone (2004), Gul et al. (2009), and Kallapur et al. (2010), albeit applying different model specifications for discretionary accrual estimates. According to Heninger (2001), the underlying reason for using the utilisation of earnings management as an indication for audit quality was that such practice has been a source of worry for regulators, due to its potential to negatively affect the quality of financial disclosure. He also noticed that the act of earnings management (even without being considered as fraud) intervened directly in the process of financial disclosure, with the purpose of bringing about benefits for some specific agents and not of keeping the disclosure neutral and fair (Heninger, 2001). From the stance of Kallapur et al. (2010), this measure enabled not only the specific analysis of exceptional scenarios (e.g. restatements or ongoing issues) but also the more general and comprehensive one of the whole problem. Dang (2004) further stated that with higher quality audits came higher prospect of discovering and preventing managerial discretions, thus implying that auditors who fail to uncover earnings management can also be considered low quality. This might be evidenced in the findings by Bedard and Johnstone (2004), which claimed that the auditors tended to put in more efforts and raise their service fees upon discovering evidence of risk of accounting manipulation. Ultimately, the auditors are expected by the agents and parties interested to curb such a practice in order to retain the fairness and truth. In the case the auditors fail to limit the management's attempt to inflate the results in order to cover disadvantageous information, the resulting financial reports also fail to warn about the issues.

Although there have been a great deal of accounting literature focusing on audit quality since DeAngelo's research (1981), there were only a few studies on the performance of external audit in financial and banking industries, as noted by Kanagaretnam et al. (2009, 2010, 2011), Dahl (2013), Dantas and Medeiros (2014), Krishnan and Zang (2014). The researches shared the common conclusion about the relationship of (discretionary) LLPs with external audit. Whilst Kannagaretnam et al. (2009) found that small US banks, which had greater earnings management through LLPs, would pay higher total fee to their auditors, the results of Kanagaretnam et al. (2010) indicated that the probability of bank failure would be lowered for a bank audited by reputable auditors, and having less LLPs. Kanagaretnam et al. (2011) resulted in a significant

evidence that the banking expertise of external auditors would mitigate information asymmetry through enhancing information relating to discretionary LLPs. Using a partial adjustment model, Dahl (2013) came out with the findings that the target ratios of LLPs of unaudited banks were lower than those of audited banks. Meanwhile, examining the context of Brazilian banking institutions, Dantas and Medeiros (2014) discovered that audit quality, measured by the absolute value of changes in discretionary LLPs, was not significantly associated with neither the degree of banking specialisation, nor the degree of audit activity concentration, nor the short-term client relationship, but was empirically confirmed to have negative relationships with the client importance and with long-term working tenure, as well as positive relationship with the establishment of the Audit Committee. Capturing the context of the global financial crisis in which audit fees were negotiated to be lower, Krishnan and Zhang (2014) suggested that there were no needs to worry about the cut of audit fees leading to reductions in audit quality because of lower audit effort, as the empirical results illustrated that negative discretionary LLPs (, which increase income) would decrease, and the relation between current LLPs and future loan charge-offs would become stronger, in audit fee cuts.

2.3 Capital management practices

The premise for capital management through LLPs is that provisions are a mechanism for bank managers to avoid the cost related to any non-compliance of capital adequacy requirements. It is worth noticing that the aforementioned 1.25% of risk-weighted assets limit suggests that general LLPs (within Tier 2 capital) have a restricted role, whereas retained earnings fall within Tier 1 capital, leading to conflicting consequences for Tier 1 and Tier 2 capital in the case of increases in LLPs. More particularly, increased LLPs reduce Tier 1 capital (through reducing retained earnings), whilst raising Tier 2 capital (as a result of larger loan-loss reserves) for the banks that fall below the 1.25% threshold. As such, the eventual net effect is up to the quantity of general loan-loss reserves. However, empirical studies regarding the utilisation of this accounting accrual by bank managers with the aim of dealing with required capital ratios mostly focused on banks in the US and did not produce consistent results. A research by Ng and Roychowdhury (2011) studied how the adding of loan loss reserves back to regulatory capital in 2007 correlated with US banks'

failure risk and other performance measures in the three years following 2007, reaching a conclusion that there was a positive correlation between them, especially for banks that were less constrained from their accounting discretion as a means to raise their regulatory capital. This finding suggested that the inclusion of loan loss reserves as Tier 2 capital would bring potentially dysfunctional consequences exposing banks to the risk of failure during an economic downturn period, the suggestion arguing against the ideology that loan loss reserves could generate buffer to mitigate the risk of failure.

There are some studies using data from before Basel I was enacted that claimed LLPs were used as an instrument to manage regulatory capital. Examining the 150 US commercial banks' data on a quarterly basis from 1976:Q1 to 1987:Q1, Scholes et al. (1990) concluded that banks who had low capital ratios raised their regulatory capital by either deferring losses or realising security gains, accepting to pay higher taxes because of this. Meanwhile, Moyer (1990) provided an evidence of a significantly negative relationship between LLPs and regulatory capital from 142 US banks over the period from 1981 to 1986, which implied that bank managers were inclined to upward adjust their banks' LLPs when the difference between their banks' primary capital adequacy ratios and regulatory minimum ratios declined. Innovating a new methodology which took into consideration the synchronicity of account, financing and making operating decisions, Beatty et al. (1995), using the panel data of 148 US banks from 1986 to 1989, found that both loan quality assessment and capital management decisions were reflected negatively through LLPs and positively through loan charge-offs. On the contrary, the empirical results of Collins et al. (1995) illustrated that capital favourably affected LLPs, as shown in the fact that bank managers had a tendency to lower LLPs (as opposed to raising them) when faced with low bank capital and they also preferred write-offs to LLPs as a means of managing capital ratios, through investigating the research sample of 160 US banks from 1971 to 1991.

As for the researches that studied the data after 1988 (when the capital adequacy regulation was effective), Kim and Kross (1998) found evidence supporting the capital management hypothesis: after the enactment of Basel I, there was a tendency at low capital banks to lower their LLP estimates in order to satisfy the new capital standards,

whereas there were no significant changes in the loan-loss provisioning at high capital banks, from the U.S market. Ahmed et al. (1999) suggested that LLP estimates were determined by the incentives toward capital management whilst reflecting adjustments in the expected quality of loan portfolio. Although providing some evidence for the capital management hypothesis, Anandarajan et al. (2007) indicated that this behaviour remained unchanged after the implementations of Basel I and II by studying data from Australian commercial banks. In alignment with Collins et al. (1995), Bouvatier and Lepetit (2008), applying the generalised method of moments (GMM), came out with the conclusion that the poorly capitalised banks, amongst the 186 European banks of which data they used to research pro-cyclical behaviour over the period 1992-2004, were less willing to generate LLPs as a means of managing regulatory capital. By contrast, Leventis et al. (2011) found no evidence for the capital management hypothesis after studying the sample of 91 European listed banks from 1999 to 2008 to find how they managed bank capital using LLPs in response to the implementation of IFRS, with the pooled OLS and fixed-effects models for the main analysis and robustness test, respectively. Meanwhile, the research of Curcio and Hansan (2015), capturing two periods 1996-2006 and 2007-2010, reached the same result with Bouvatier and Lepetit (2008) for non-Euro Area banks rather than for Euro Area ones, when using the regulatory-capital dummy variable defined by Bouvatier and Lepetit (2008); however, when using total capital ratio, the estimation results were aligned with those of Leventis et al.(2011) for either non- or Euro Area institutions. Solely performing pooled-OLS analyses on commercial and savings banks within the 27 European Union Member States from 2005 to 2010, Garsva et. al (2012) approved the hypothesis of regulatory capital management in the way that banks with lower current capital ratios were apt to lessen LLPs throughout the next year, for the whole sample, and for the sub-samples such as EU-15, Southern Europe, Central Europe and Eurozone.

2.4 Earning management practices

Earnings management is defined as the practice of manipulating the reported earnings so that the profit and loss account is not representative of the actual economic situation of a bank. Amongst the different types of earnings management, income smoothing is aimed at lowering net profit's variability over time, by increasing LLPs when earnings

are high and decreasing them otherwise. Motivations for income smoothing can be to adjust the bank's performance to fit a mean specific to that firm (Collins et al., 1995) or the average of other banks (Kanagaretnam et al., 2005). Regarding the reasoning behind this practice, Bhat (1996) pointed out that income smoothing improved the regulators' perception of a bank's risk, helped steadying the managers' compensation, allowed them to maintain stable dividends to stockholders, reduced earnings volatility and thus kept the banks' stock price stable.

Although the reasoning behind income smoothing in the financial reporting of industrial firms have been studied extensively in literature such as Barnea et al., (1975) Ronen and Sadan (1981), Fudenberg and Tirole (1995); Goel and Thakor (2003), it is still relevant to refer to literature in banking for a special insight: in this field, income smoothing can also be studied from the perspective of the supervisory authority. This is appropriate since the bank regulators require the banks to separate LLPs from the matter of expected credit losses but at the same time to raise a sufficient capital to meet unexpected credit losses. Following this, the regulators are interested in decreasing pro-cyclical behaviour at the banks; in other words, they expect banks to raise their loan-loss reserves in financially good periods and otherwise take away resources from the reserves in financially difficult periods (i.e. when potentially high-risk loans actually default). As such, the bank managers' attempt to follow capital adequacy regulations can result in earnings management at those banks. Although there is an extensive amount of literature in US banking studying income smoothing, those researches produced mixed results. The research by Greenawalt and Sinkey (1988) found that regional banks had more tendency to get involved with income smoothing than money-centred banks. Ma (1988) reported that commercial banks in the US utilised LLPs and charge-offs to smooth out their reported earnings, albeit unexpectedly finding no evidence of the relationship between LLPs and loan portfolio quality. This could be interpreted that those bank managers used LLPs as a means to manage their earnings, raising their LLPs when operating income was high and vice versa. This was supported by the study by Collins et al. (1995), which also found a positive relationship between the two. Bhat (1996) claimed that small banks that were in bad financial conditions were more likely to engage in income smoothing, whilst Anandarajan et al. (2007) concluded that commercial banks in Australia were involved in earnings management, especially the ones that were publicly traded.

On the contrary, there were also researches that found no proofs of income smoothing, such as Scheiner (1981), Wetmore and Brick (1994), Beatty et al. (1995), and Ahmed et al. (1999). The last one in the list particularly did not find any proof of earnings management using LLPs, even after the enactment of Basel I, which was surprising since the new regulation that came with Basel I abolished the constraints regarding earnings management. Fonseca and González (2008) found that in developed and market-oriented financial systems, there was an increased motivation for earnings smoothing. According to the results of this study involving data about cross-country of income smoothing from banks from different countries, there were less incentives to smooth income in banking systems with increased levels of accounting disclosure and stricter limitations regarding banking activities. Bouvatier and Lepetits (2008) found empirical evidence that contradicted the income smoothing hypothesis: the European banks in their study decreased their LLPs as their pre-tax earnings and LLPs increased, which capitalised the cyclicity of LLPs because of the non-discretionary components (due to the higher earnings in periods of growth). Lastly, a study by Leventis et al. (2011) found overall evidence for the earnings management hypothesis, even though the implementation of IFRS in 2005 earnings management had noticeably decreased this practice.

2.5 The regulatory impacts on the performance of external audit

Whilst current literature has fairly covered the effects that auditors and regulators have on financial reporting, not much of it has been dedicated to studying how they affect financial reporting simultaneously. Amongst the researches that did, a certain number of studies investigated the more extreme consequences of the auditing process in the US banking context. Firstly, in Curry et al. (1999), the implementation of measures and CAMELS ratings downgrading were investigated, leading to the conclusion that the banks increased their loan loss provisions as a response to these measures. Following this, a study by Gunther and Moore (2003) claimed that supervisory inspections and external audits had a positive correlation with Call report statements, which resulted in loan loss provision revisions, which in turn led to increases. Later, Costello et al. (2015) examined supervisory leniency measured by the regulatory index, which was a result of Agarwal et al. (2014), and its effect on the prospect of

restatements for decreasing income. Although such an effect was found (with a negative association), the same could not be said for an effect related to the amount of external audit work.

There were also other papers that focused more on the ongoing effects that regulators and auditors, by influencing loan loss provisions, had on financial reporting. Amongst them, Kanagaretnam et al. (2010) discovered that unusual audit fees had a negative correlation with discretionary loan loss provisions, but this effect only existed for banks that were not susceptible to the internal control provisions by the Federal Deposit Insurance Corporation Improvement Act (FDICIA) or Sarbanes-Oxley Act (SOX). This finding was interpreted to prove that, when auditors were presented with large unexpected fees and banks were not under internal control provisions, auditors would compromise their independence. As for regulators, Rezende and Wu (2014) studied the changes regarding how frequently on-site examinations were carried out and concluded that an increase in this frequency were related to decreases in loan loss provisions, non-performing loans, and charge-offs. These effects were interpreted as risk-taking in bank supervision discipline. On the contrary, an early study by Dahl et al. (1998) claimed that bank regulators increased charge-offs for commercial loans without adjusting loan loss provisions, whilst auditors did significantly increase provisions. The discrepancy in their findings could be accounted for by the strategy for identification or the differences in the time period sampled. Altamuro and Beatty (2010), studying how FDICIA's internal control provisions influenced banking accounting quality, claimed that banks that had more than \$500 million worth of assets enjoyed more validity for loan loss provision and persistence in earnings, as well as less benchmark-beating and conservatism, compared to banks not susceptible to internal control provisions.

More significantly, Nicoletti (2016), looking into how bank regulators and external auditors affect loan loss provisions in US state-chartered banks, in a relative comparison with national banks, from 1997 to 2005, found that amongst the state-chartered banks receiving no external audits, those under strict regulatory scrutiny (measured by the regulatory index) would recognise concurrent (year t) and future (year $t+1$) non-performing loans in loan loss provision more than those under lenient regulatory scrutiny. Similarly, amongst the state-chartered banks subject to lenient

regulatory scrutiny, there were greater recognitions of the non-performing loans occurred in the audited banks than in the unaudited banks. It is clear that either of these individual effects was only significantly positive in the absence of any conflict between regulatory control and external audit. In the case of the occurrence of the conflict stemming from receiving external audit, there was no significant evidence for the differences in recognising the non-performing loans between those under strict and lenient regulatory scrutiny. By contrast, under the conflict coming from being subject to strict regulatory control, those receiving external audit would recognise the non-performing loans less than those not being audited. From those empirical results, Nicoletti (2016) advocated that the recognition in loan loss provisions was influenced by regulatory control and external audit in different ways, and the impact of external audit on the recognition behaviour dominated that of regulatory control.

From the current literature, it is advisable to suggest that both regulatory-supervisory controls and external audit yielded favourable influence on financial reporting since they corrected the recognition of loan loss provisions by banks. However, there were some pieces of evidence to illustrate the deficiencies of external audit in the information production with the absence of the US governmental controls. Even under strict regulatory scrutiny, external audit unfavourably influenced the recognition of the current and future risks in loan loss provisions, the inadequacies to some extent backed by the evidence of Nicoletti (2016). Nonetheless, this does not necessarily mean that the importance of external audit could be replaced by the regulation and supervision, since lenient regulatory scrutiny could be supplemented with external audit to improve the recognition in loan loss provisions, the supplement be evidenced in Nicoletti (2016).

2.6 Conclusions

As far as the introduction is concerned, banks are inclined to practice the discretion in provisioning loan losses to manage their capital and earnings, and thus reporting unfair and untrue accounting information about their business. Meanwhile, conducted by independent parties – mediators between principals and agents, external audit is supposed to reduce information asymmetries. From the literature review, it is clear that most of the preceding studies either focused on the association between discretionary

loan loss provisions and the quality of external audit without taking governmental intervention into consideration, or investigated how capital regulations influenced the managerial discretions through provisioning loan losses without involving the presence of external audits. There were a few of the studies examining the effects of regulators and external auditors on the quality of financial information at the same time, but mainly in the context of the United States banking system. Whereas, it seems that there is a lack of researches examining how the development of financial regulations and supervisions has influenced the performance of external audit or the quality of audited information, specifically regarding loan loss provisions in the EU banking system, which experienced the transition from not being isomorphic in Member States to being integrated into the single supervisory architecture. Motivated by this research gap, my research paper will aim to contribute an assessment on the influences of financial regulations and supervisions on audit quality in the EU banking system from 2001 to 2019.

3 RESEARCH METHODOLOGY

3.1 Quantitative research approach

With the objective of unveiling the effects of banking capital regulations and supervisions between the period 2001-2019 on the quality of audited financial information in the context of the European banking system, this research will, at first, identify the managerial discretions in loan loss provisioning by estimating discretionary LLPs (DLLPs), which will be in turn used to determine the proxy for audit quality. Secondly, by applying panel-data analysis, including fixed-effects and random-effects methods, together with the Hausman specification test on the consistence of the estimators of these models to make a selection, the research will regress independent variables relating to capital requirements, external audit, and bank specific characteristics on the dependent variable of audit quality. It is of great necessity to note that the legislation on banking regulations and supervisions in the EU banking system could be divided into 3 regimes: before 2006, 2006-2012, and 2013 up to now, which will be treated as the period dummy variables interacting with the variables of capital requirements and external audit. This statistical analysis is expected to uncover how significantly the audit quality was influenced by capital and earning managements, to what extent the external audit efforts constrained these influences, and how the stringency of banking regulations and supervisions affected the audit quality through controlling external audit and capital management. Going further to capture the impact of the Single Supervisory Mechanism (SSM) in the European banking system, the third step will conduct the estimation of Difference in Difference between two groups which will be divided based on being less significantly supervised or significantly supervised by the European Central Bank under the SSM framework, and the panel-data estimations on sub-samples to determine to what extent the oversight of the Central Bank had affected the audit quality.

3.1.1 Discretionary loan loss provisions and audit quality

Although there is no unanimous model for estimating discretionary loan loss provisions, this estimate often draws on the investigation into the determinants of bank provisioning. In general, many studies (Wahlen, 1994; Ahmed et al., 1999; Beatty et

al., 2002; Laeven & Majnoni, 2003; Ng & Roychowdhury, 2011) mainly expressed loan loss provision as the function of non-discretionary loan factors in respect of total loans, non-performing loans, and loan loss reserves, thus taking the error terms from the pooled cross sectional and time series model estimation as the indicator of discretionary loan loss provisions. Drawing on the baseline model, this research will estimate discretionary loan loss provisions by the following modified empirical model (3.1) which will take GDP growth as a country indicator to control the macroeconomics effect on loan loss provisions. This is because the research will examine banks across the European area, different from the preceding studies focusing on banks within one country, either the United States or Brazil.

(3.1) The pooled cross-sectional and time-series OLS (Ordinary Least Squares) specification:

*Loan Loss Provision*_{*i,t*}

$$= \beta_0 + \beta_1 \Delta Loan_{i,t} + \beta_2 NPL_{i,t-1} + \beta_3 \Delta NPL_{i,t} \\ + \beta_5 Loan Loss Allowance_{i,t-1} + \beta_7 GDP Growth_{n,t} + \varepsilon_{it}$$

Where:

- *Loan Loss Provision*_{*i,t*} is provision for expected loan losses recorded at bank *i* at year *t*
- $\Delta Loan_{i,t}$ is change in the value of total loans of bank *i* during year *t* ($Loan_{i,t} - Loan_{i,t-1}$)
- $NPL_{i,t-1}$ is the beginning balance in non-performing loans of bank *i* at year *t*, i.e., the ending balance in non-performing loans of bank *i* at year *t* - 1
- $\Delta NPL_{i,t}$ is change in non-performing loans of bank *i* during year *t* ($NPL_{i,t} - NPL_{i,t-1}$)
- *Loan Loss Allowance*_{*i,t-1*} is the beginning balance in loan loss allowance of bank *i* at year *t*, i.e., the ending balance in loan loss allowance of bank *i* at year *t* - 1
- ε_{it} is a composite error term, taken as the measure of discretionary loan loss provisions (discretionary LLPs)
- *GDP Growth*_{*n,t*} is change in Gross Domestic Product of country *n*

- All variables, except for GDP Growth, are normalised by the average of beginning and ending total assets at the corresponding year to mitigate potential heteroskedasticity problems.

However, along with potential heterogeneity problems, it is worth considering that the result from the OLS regression (3.1) might be biased by the correlation of individual characteristics embodied in the errors term with independent variables, thus implying that discretionary loan loss provisions component from the OLS result might be subject to non-discretionary loan loss provisions component. Acknowledging the sources of possible bias in the research findings, this research will conduct the robustness analyses using the error term from the estimation with the fixed-effects model specification (3.2), after confirming whether this unique error term is associated with the non-discretionary regressors by Hausman test.

(3.2) The fixed cross-sectional effects specifications:

*Loan Loss Provision*_{*i,t*}

$$= \beta_0 + \alpha_i + \beta_1 \Delta Loan_{i,t} + \beta_2 NPL_{i,t-1} + \beta_3 \Delta NPL_{i,t} \\ + \beta_5 Loan Loss Allowance_{i,t-1} + \beta_7 GDP Growth_{n,t-1} + \omega_{it}$$

Where

- *Loan Loss Provision*_{*i,t*} is provision for expected loan losses recorded at bank *i* at year *t*
- $\Delta Loan_{i,t}$ is change in the value of total loans of bank *i* during year *t* ($Loan_{i,t} - Loan_{i,t-1}$)
- $NPL_{i,t-1}$ is the beginning balance in non-performing loans of bank *i* at year *t*, i.e., the ending balance in non-performing loans of bank *i* at year *t* - 1
- $\Delta NPL_{i,t}$ is change in non-performing loans of bank *i* during year *t* ($NPL_{i,t} - NPL_{i,t-1}$)
- *Loan Loss Allowance*_{*i,t-1*} is the beginning balance in loan loss allowance of bank *i* at year *t*, i.e., the ending balance in loan loss allowance of bank *i* at year *t* - 1
- α_i is a time-invariant specific individual effect

- ω_{it} is an idiosyncratic error term, taken as the measure of discretionary LLPs error term, taken as the measure of discretionary loan loss provisions (Discretionary LLPs)
- $GDP\ Growth_{n,t}$ is change in Gross Domestic Product of country n
- All variables, except for GDP Growth, are normalised by the average of beginning and ending total assets at the corresponding year to mitigate potential heteroskedasticity problems.

As far as the measurement of external audit quality is concerned, following Dantas and Medeiros (2014), this study will use the negative of the absolute value of the first difference in discretionary loan loss provisions as a proxy for external audit quality, rather than using directly the component of discretionary loan loss provisions, in spite of its relationship with external audit evidenced by the preceding studies. The main reason for taking the differential between the two periods is to capture the persistence of the behaviour of recognising accruals allowed by the external audit. Besides, it is of great necessity to take the absolute value, since this study focuses on the degree of discretionary loan loss provisions, which illustrates the accuracy of audited financial information, rather than the sign, which can be negative or positive, corresponding to increasing-income or decreasing-income. The negative value will indicate that the higher the proxy value is, the better the audit quality will be. The formula for calculating audit quality is represented as follows:

(3.3)

$$AQ_{i,t} = -|Discretionary\ LLPs_{i,t} - Discretionary\ LLPs_{i,t-1}|$$

Where:

- $AQ_{i,t}$ is the quality of external audit at bank i at year t
- $Discretionary\ LLPs_{i,t}$ is the error term estimated from either the model (3.1) or the model (3.2)

3.1.2 The influences on audit quality

As discussed in the literature review, this research concentrates on the two managerial sources of practicing the discretions in the estimate of loan loss provisions. Firstly,

with the purpose of smoothing income, banks would understate or overstate loan loss provisions to achieve expected levels of income. Secondly, due to the regulatory capital requirements, banks poorly capitalised would be inclined to make less loan loss provisions. Such practices are expected to be alleviated by external auditing, thus implying that the persistence of the degree of discretionary loan loss provisions could reflect the level of discretionary accruals which the auditors concur with. As a result, it is reasonable to anticipate the significant relationship of external audit's quality with the levels of capital and profitability, respectively indicated by capital adequacy ratio (CAR) and return on equity (ROE). Additionally, the quality of external audit could also be influenced by how much effort auditors spent or how much they compromised their independence; therefore, the research will take the natural logarithm of audit fees, as well as its interactions with CAR and ROE as indicators for these features. The empirical model also controls the observable specific individual effects of internal audit and bank risks through taking into account the variables of internal audit committee independence, non-audit fee ratio, leverage, and liquidity.

In the scope of this study, it is important to examine how stricter banking regulations and supervisions would influence the quality of external audit through requiring more paid effort from external audit, and through constraining capital management practices in the European banking system. Hence, the interactions of period dummies with the audit-fee indicator and capital adequacy ratio must be placed in the empirical model for estimating the influences on audit quality. Besides, it is worth noting that although having not been set out to control earnings management practices, the regulatory capital requirements influence the decisions on earnings management practices through loan loss provisions; thus, there is an expectation of the conditional effect of this discretion on the quality of external audit, the effect which will be captured through the interaction between CAR and ROE in the model.

The empirical model (3.4) for estimating the influences on audit quality will be formulated as follows:

$$\begin{aligned}
AQ_{i,t} = & \theta_0 + \theta_1 CAR_{i,t} + \theta_2 \ln(Audit\ Fees)_{i,t} + \theta_3 ROE_{i,t} + \theta_4 CAR_{i,t} \\
& * \ln(Audit\ Fees)_{i,t} + \theta_5 CAR_{i,t} * ROE_{i,t} + \theta_6 \ln(Audit\ Fees)_{i,t} \\
& * ROE_{i,t} + \theta_7 - \theta_8 \ln(Audit\ Fee)_{i,t} * Period\ Dummies \\
& + \theta_9 - \theta_{10} CAR_{i,t} * Period\ Dummies + \gamma Z_{i,t} + \delta W_{i,t} + \alpha_i + \varepsilon_{it}
\end{aligned}$$

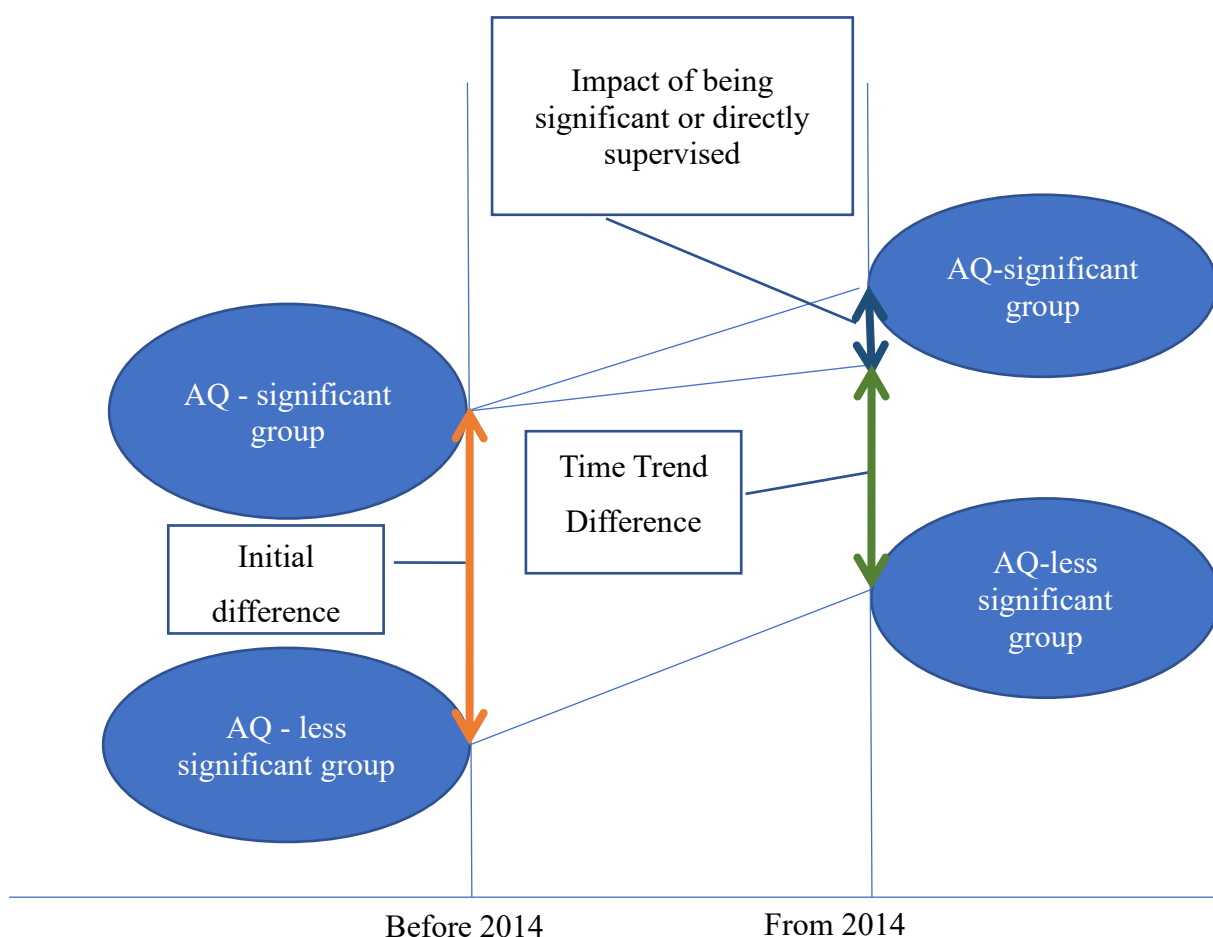
Where:

- $AQ_{i,t}$ is the quality of external audit at bank i at year t, estimated from the equation (3.3)
- $CAR_{i,t}$ is capital adequacy ratio of bank i at year t
- $\ln(Audit\ Fees)_{i,t}$ is the natural logarithm of audit fees paid by bank i at year t
- $ROE_{i,t}$ is return on equity of bank i at year t
- *Period Dummies* are dummies variables for the three phases of implementing international banking regulations and supervisions in the European banking system, with the base for the before-2006 period dummy
- Z_{it} is a vector of regressors including observed variables relating to bank risk characteristics, including the liquidity ratio (total loans * 100/total deposit) and the leverage ratio [(total assets – total shareholder equity) * 100/average total assets]
- W_{it} is a vector of regressors representing the characteristics of internal audit, including the index of audit committee independence and the non-audit fee ratio
- α_i and ε_{it} are time-invariant effect and idiosyncratic error terms, respectively

3.1.3 The influence of the Single Supervision Mechanism on external audit quality

Last but not least, this section will suggest the statistical technique of difference in difference, in order to assess whether or not the legislative and international framework of Single Supervision Mechanism has favourable influence on the quality of external audit, as this framework has been granting the ECB the authority to directly supervise financial institutions which this central bank consider to be significant, and to leave less significant banks to their national authorities since 2014. Understanding that the ECB also possesses the determining-significance criteria in respect of size, economic

importance, cross-border activities, and direct public financial assistance, which could identify the quality of external audit, the study will presume that there is a difference in the quality of external audit between the two groups of significant banks and less significant banks before 2014, the initial difference needed to control. It is of great importance to acknowledge that in addition to the SSM intervention, there could be the presence of other factors which over time bring about disparate changes in the quality of external audit performed in the two groups, as the common time-trend difference would cause a bias on the estimation of the SSM impact on the group of significant banks unless being controlled. The graphical presentation for the difference-in-difference assumptions will be illustrated as follows:



The difference-in-difference parameters will be estimated from the following OLS equation (3.5):

$$AQ_{it} = \delta_0 + \delta_1 SSM + \delta_2 \text{Significant Group} + \delta_3 SSM - \text{Treatment} (SSM * \text{Significant Group}) + \varepsilon_{it}$$

Where:

- $AQ_{i,t}$ is the quality of external audit at bank i at year t , estimated from the equation (3.3)
- SSM is a time dummy variable with the value 0 for the years before 2014 (Pre-SSM) and 1 for 2014 onwards (SSM)
- *Significant Group* is a group dummy variable with the value 0 for the less significant banks and 1 for the significant (ECB-supervised) banks
- $SSM - Treatment$ is a dummy variable with the value 1 for the significant banks in the years from 2014, and 0 for the otherwise, i.e., an interaction term between the two dummy variables, *Post - SSM* and *Supervised Group*.

Going beyond the assessment on whether the direct supervision of the ECB has affected the quality of external audit, this research will also aim to figure out how the predictors specified in the model 3.4 would differently affect the external audit's quality of the two groups between the two periods. By doing so, the study will conduct sub-sample analyses with the specification of the model 3.4 but releasing related-to-period dummy variables and the test of difference between two coefficients.

3.2 Descriptive statistics

3.2.1 Sample selection

Based on the list of 565 equities from 27 European markets from Thomson Reuters DataStream, the research removed the duplicate equities issued by an identical bank entity, and eliminated equities issued by foreign entities outside the European areas, thus acquiring a bank list of 174 entities. In comparison with the lists of supervised and less supervised entities, firstly published in each year from 2014 to 2019 by the ECB, the bank list of 174 entities comprises 95 banks and bank holding companies either which or subsidiaries of which consistently appeared in the ECB's lists over the period. It is necessary to note that 11 of the 95 banks and bank holding companies place their headquarters outside the 19 Eurozone EU Member States, but parts of them are still in the ECB's lists. The distribution of the 95 banks and bank holding companies by country is illustrated below in Table 3.1.1.

Derived from Thomson Reuters DataStream, the panel data, used in the scope of this research, consists of accounting items in consolidated balance sheets and income statements of 95 banks and bank holding companies over the 2001 – 2019 period.

Meanwhile, the macroeconomic data is extracted from the Eurostat database. The dataset is significantly representative of the banking system as these banks account for 76% of total assets of the banking system and provide 94% of total loans of the whole system (estimated in 2018).

Table 2. Distribution of banks and bank holding companies by country

Country	Number of banks		Actual number of banks used in the estimates
Austria	8		7
Belgium	3		2
Cyprus	3		2
Estonia	1		-
Finland	4		3
France	4		4
Germany	13		9
Greece	5		5
Ireland	5		4
Italy	16		15
Lichtenstein	1	Non-eurozone EU Member states	1
Lithuania	3		3
Malta	2		1
Norway	1	Non-eurozone EU Member states	1
Portugal	1		1
Slovakia	3		3
Slovenia	1		-
Spain	9		9
Sweden	3	Non-eurozone EU Member states	2
Switzerland	4	Non-eurozone EU Member states	2
The Netherlands	3		3
United Kingdom	2	Non-eurozone EU Member states	2
Total:	95		79

3.2.2 The description of the dataset

Drawing on the section 3.1 apropos of the estimate specifications, it is succinct when the variables are categorised into five groups: dependent variables, independent variables, bank risk-specific factors, internal audit-specific factors, and macroeconomic factors. Looking at the descriptive statistics in Table 3, it is noticeable that, loan loss provisions (LLPs), defined as expected losses from uncollectable or troubled loans, and taken as the regressand in the model 3.1 to estimate discretionary

loan loss provisions and construct a proxy for the quality of external, has a range from -2.3% to 17.7% with a mean of 0.59% of average total assets. The negative values indicate that prior to the year end, there was overestimation of loan loss reserves (allowances) needed lowering, when the quality of assets was improved by the recovery or expansion of economic environment. Meanwhile, the two explanatory variables at the bank level in the model 3.1, the ratios of non-performing loans (NPLs) and loan loss reserves (LLRs) over average total assets, have positive ranges from nearly 0% to respectively 83.1% and 37.1%, corresponding to means of 9% and 3.7%. The last variable in the model 3.1 is the growth of GDP, a macroeconomic factor, which ranges between -17.6% to 34.9%.

As regards the main regressors in the model 3.4, capital adequacy ratio, whose relationship with the quality of external audit would indicate capital management, spreads from the negative value of -2.6% to 32.6% with a mean of 15.43%. There is only one negative ratio for National Bank of Greece in 2011, implying that the bank ended up with negative equities and faced with insolvency problems. Used to capture earning management, return on equity (ROE) has a wide range from -1444.47% to 82.95% with an average ratio of 64.97%. The only one negative four-digit ratio (1444.5%) was also recorded for a Greece bank, Alpha Bank in 2012. Considered as a proxy for the effort of external audit, the natural logarithm of audit fees spans from 10.65 to 18.59 on the logarithmic scale, corresponding to 1 thousand Euros to 118 million Euros.

Considering the controllable variables in the model 3.4, there are two regressors for each internal audit-specific control and bank risk-specific control. For the first control, this research uses the percentage of independent board members in audit committee and the ratio of non-audit fees over audit fees. The former indicator ranges from 0% to 100%, corresponding to having no independent members and having all independent members. The non-audit fee ratio is distributed from 0% to 464% with a mean ratio of

Table 3. Data description

	Obs.	Mean	Std. Deviation	Min	Max
Dependent Variables					
Loan loss provisions (LLPs %, of av. total assets)	878	0.5858	1.0108	-2.3259	17.7231
Independent Variables					
Total loans (Loans %, of av. total assets)	878	66.7940	16.9483	7.3534	122.6086
Non-performing loans (NPLs %, of av. total assets)	878	5.2025	9.0304	0.0014	83.1343
Loan loss reserves (LLR %, of av. total assets)	854	2.7239	3.7261	0.0192	37.1148
Capital adequacy ratio (%)	608	15.4276	4.3896	-2.6	32.6
The natural logarithm of audit fees (lnAF)	608	15.4214	1.5767	10.6490	18.5879
Return on Equity (ROE, %)	608	1.3363	64.9692	-1444.47	82.95
Internal Audit Specific Factors					
Non-audit fee ratio (%)	442	37.3597	46.3330	0	464
Audit committee independence (ACI)	472	80.7960	22.8214	0	100
Bank Risk Specific Factors					
Leverage (LEV, %)	608	95.3836	6.9075	74.1092	140.7816
Liquidity (LIQ = LOANS/DEPOSITS, %)	608	153.4838	82.3264	8.5464	980.5901
Macroeconomic Factor					
GDP Growth (%)	608	2.9332	4.8664	-17.6213	34.9121

37.36%. Meanwhile, the ratio of total liabilities to average total assets and that of total loans to deposits, indicating respectively leverage and liquidity, are taken into account for the second control. The leverage ratio is described with a range from 74.11% to 140.78%, and an average ratio of 95.38%. Although the generally accepted leverage ratio spreads maximum to 100%, in this case, over 16.94% of the observations experience the leverage ratio of above 100%. The disparity from the maximum level is resulted mainly from the way of calculating this ratio by average total assets of the beginning and the ending of a year, rather than total assets reported at the year end, whilst using the ending of total liabilities, which can be significantly higher than the beginning amount. For the last controlled variable, with a mean of 153.48%, the liquidity ratio, indicating how much a bank exploits its deposit fund to supply more loans in exchange of reduction on its cash fund, ranges from 8.5% to 980.6%.

Table 4. Correlation matrices and Variance inflation factors of independent variables

Panel A: For the Equation 3.1							
Variables	Δ Loans	Δ NPLs	NPLs _{t-1}	LLR _{t-1}	GDP growth		
Δ Loans	1						
Δ NPLs	0.1633	1					
NPLs _{t-1}	-0.192	-0.2551	1				
LLR _{t-1}	-0.2076	-0.1391	0.8328	1			
GDP Growth	0.1524	-0.1894	-0.0876	-0.0491	1		
	VIF	SQRT VIF	Tolerance	R-Squared			
Δ Loans	1.1	1.05	0.9072	0.0928			
Δ NPLs	1.38	1.17	0.7268	0.2732			
NPLs _{t-1}	3.89	1.97	0.2573	0.7427			
LLR _{t-1}	3.42	1.85	0.2924	0.7076			
GDP Growth	1.17	1.08	0.8549	0.1451			
Mean VIF	2.19						
Panel B: For the Equation 3.4							
Variables	CAR	lnAF	ROE	Non-audit fee ratio	ACI	LEV	LIQ
CAR	1						
lnAF	0.0369	1					
ROE	0.134	0.0912	1				
Non-audit fee ratio	-0.0935	-0.0672	0.0127	1			
ACI	0.0077	0.0255	0.0908	0.1187	1		
LEV	-0.2794	0.1245	0.0666	0.0169	0.0312	1	
LIQ	-0.0187	-0.2384	-0.0522	0.0275	-0.0702	0.0045	1
	VIF	SQRT VIF	Tolerance	R-squared			
CAR	1.14	1.07	0.8801	0.1199			
lnAF	1.11	1.05	0.8987	0.1013			
ROE	1.05	1.02	0.9568	0.0432			
Non-audit fee ratio	1.03	1.02	0.9706	0.0294			
ACI	1.03	1.02	0.9671	0.0329			
LEV	1.17	1.08	0.8576	0.1424			
LIQ	1.07	1.04	0.9306	0.0694			
Mean VIF	1.08						

As respectively represented in Panel A and Panel B of Table 4, the results on the correlation matrices and variance inflation factors for independent variables in equations 3.1 and 3.4 indicate that there is no explanatory variable highly correlated to others in each model, i.e. the multicollinearity is low, as the VIF for each independent variable is lower than 5. Hence, it is suggested that the proposed models are not subject to the multicollinearity problem.

4 EMPIRICAL EVIDENCE

4.1 Discretionary loan loss provision estimates

As discussed in the previous section, the first stage of this research's examination is set out to regress the non-discretionary component variables on the dependent variable of loan loss provisions with the aim of estimating the component of discretionary loan loss provisions, which will be used to construct the proxy for the quality of external audit. Although not deemed a central objective in this research, it is still essential to provide insights into how the non-discretionary determinants of loan loss provisions behave without controlling their counterparts and whether the behaviours are consistent with the preceding studies either including the two components in a one-stage regression procedure or separating them in a two-stage regression procedure. As illustrated in Table 5, the relationships between loan loss provisions and the indicators of non-performing loans are consistently positive at the significance level of at least 5%, which is aligned with the empirical results from the previous studies. The positive relationships indicate that expected losses are recognised through a backward-looking rule based on identifying concurrent problem loans. More specifically, a 100-euro-higher level of change in non-performing loans (between the beginning and ending) and that of non-performing loans at the beginning of year would lead to an increase in loan loss provisions by 8.5 euros or 4.95 euros, respectively.

Meanwhile, the coefficients on the variable of change in gross loans are negative, albeit inconsistently significant, implying an ambiguous association between the level of loan portfolio and loan loss provisions. Indeed, some of the previous studies, such as Wahlen (1994) and Beatty et al. (2002), included the variable set of differently categorised loans, rather than using total loans, to capture the variance in the expectation of loan losses for different types of loans. By contrast, without controlling the quality of loan portfolio, Garsva et. al (2012), using the one-stage OLS estimate approach, resulted in an insignificantly negative relationship of change in total loans with loan loss provisions for the EU-27 sample and for the EU-12 (new members) sample, but a significantly negative one for the EU-15 (old members). These empirical results implied that the quality of loan portfolio might be an unobserved bank-specific characteristic, or at least a bank-group-specific one. In alignment with the findings of

Garsva et. al (2012), this study comes up with a negative coefficient on change in total loans at the significance level of 5% by applying the fixed cross-sectional effects estimate.

Table 5. Loan Loss Provisions

Explanatory variables	(1) Pooled OLS	(2) Fixed Effects	(3) Random Effects	(4) Fixed effects- Robust SE
Δ Loans	-0.0026 (0.003)	-0.0079** (0.003)	-0.0047 (0.003)	-0.0079** (0.004)
Δ NPLs	0.0850*** (0.007)	0.0782*** (0.007)	0.0829*** (0.007)	0.0782*** (0.024)
NPLs _{t-1}	0.0495*** (0.006)	0.0585*** (0.007)	0.0547*** (0.006)	0.0585** (0.028)
LLR _{t-1}	0.0348** (0.014)	-0.0421** (0.018)	-0.0007 (0.015)	-0.0421 (0.056)
GDP Growth	-0.0412*** (0.006)	-0.0321*** (0.006)	-0.0374*** (0.006)	-0.0321*** (0.007)
Constant	0.3589*** (0.038)	0.5029*** (0.043)	0.4070*** (0.052)	0.5029*** (0.048)
F	119.9562	47.0818		19.5441
R-squared	0.4095	0.2302		0.2302
N	871	871	871	871

Breusch and Pagan Lagrange multiplier test: The null hypothesis: $\text{Var}(u) = 0$
Chi-bar-squared (01) = 10.12
Prob > Chi-bar-squared = 0.0007

Hausman test: The null hypothesis: difference in coefficients is not systematic
Chi-squared (5) = 29.51
Prob > Chi-squared = 0.0000

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Similar to the variable of change in gross loans, there are contradictory results of the relationship between the beginning balance of loan loss reserves (allowances) and loan loss provisions in the OLS and fixed effects estimates, albeit consistently significant. Both types of this relationship possibly exist and are evidenced by previous researches. Whilst Wahlen (1994) found that a larger prior accumulation of accrued provisions would lead to smaller provisions recognised at the year-end, the results from Beatty et al. (2002) and Ng & Roychowdhury (2011) indicated loan loss provision recognised at the year-end would be increased by a larger amount of loan loss reserves at the beginning of the year. More than that, Garsva et. al (2012) found only a significantly

negative relationship between the beginning balance of loan loss reserves and loan loss provisions for the EU-15 (old members). Hence, it is reasonable to advise that this association is also affected by an unobserved bank-specific characteristic.

Taken as a non-discretionary factor at the macroeconomic level, the growth rate of GDP has a consistently negative association with loan loss provisions at the significance level of 1%. Therefore, this research arrives at the same conclusions of Bouvatier & Lepetit (2008), Leventis et al. (2011), Garsva et al. (2012), and Curio & Hasan (2015) about the procyclicality of provisioning expected loan losses, which means that banks are inclined to lessen loan loss provisions in the interest of their income in an economic downturn, and vice versa.

Despite the fact that the explanation power of the fixed cross-sectional effects estimate is lower than those of the pooled cross-sectional and time-series estimate, the Breusch and Pagan Lagrange multiplier test rejects the null hypothesis that the variance of the average pooled OLS residual is zero, i.e., there is no cross-sectional dependence. This implies that the cross-sectionally independent disturbances should be controlled at least by the random effects model which is also in turn rejected by the Hausman test, thus making the fixed effects model preferred. The reason for the reduction on the explanation power could come from the absence of time effects, which will be controlled in the second- and third-stage analyses. Nonetheless, this research will construct the proxy for audit quality by using the residuals of firstly the OLS estimate (AQ_OLS, i.e. audit quality from the OLS residuals) for the primary estimates, and then those of the fixed-effects estimate (AQ_FE, i.e. audit quality from the fixed cross-sectional residuals) for the robustness estimates, in the successive analyses.

4.2 The influences on audit quality

With respect to the main research's objective of examining the impact of stricter banking regulations and supervisions on the quality of external audit in the European banking system, the results represented in Column 1 and 2 of Table 6 indicate that the quality of external audit in the two periods of the Basel II and Basel III implementations was significantly lower than that in the period of the Basel I

implementation. Especially, the reduction in audit quality of the third period, relative to the first one (before 2005), was more economically and consistently significant, as both main and robustness estimates result in larger and statistically meaningful coefficients on the 2013-2019 period dummy. This deterioration in audit quality could be the repercussion of the Basel III's provisioning standards which have enabled managers to practice discretions on loan loss estimates based on the management's considerations about credit risk of each loan category, thus generating the persistence of discretionary loan loss provisions which the external auditors have either compromised on or overlooked. However, when taking more specific control for the impact of the Basel III implementation conditional on the interests received by or the corresponding effort spent by external audit, the estimates in Column 3 – 5 of Table 6 result in significantly negative coefficients on the 2013 – 2019 period interaction term with the natural logarithm of audit fees, implying that the higher the audit fees were, the higher discretionary loan loss provisions were persistently accepted by external auditors. This finding remains unchanged in the robustness estimates in Table 7. Therefore, at first glance, it may be concluded that the stringency of the EU capital regulations has undesirably affected the quality of audited information regarding loan loss provisions, as well as reducing the effectiveness of the auditing costs in providing true and fair views on the LLPs information. These conclusions answer to the first research question.

In alignment with Bouvatier & Lepetit (2008), Garsva et al, (2012), and Curcio & Hansan (2015) examining the European banking industry, both main and robustness empirical results of this research, presented in Table 6 and Table 7, provide the evidence for capital managements, as the coefficients on CAR are negative, albeit inconsistently significant through all model specifications' estimates. The negative relationship indicates that more capitalised banks experienced higher levels of persistent discretionary loan loss provisions than less capitalised banks, i.e. the quality of external audit performed in more capitalised banks was lower than in those poorly capitalised. Nonetheless, the capital management was to some extent constrained by stringency of capital-source requirements limiting the inclusion of loan loss provisions in the own funds, as evidenced by the significantly positive coefficients on the interaction between the 2013-2019 period dummy and CAR. This evidence supports the conclusion that the rigorous capital requirements of Basel III in the EU banking

systems have achieved their purposes in mitigating managerial discretions on provisioning loan losses, in comparison with those of Basel I, thus contributing to a moderate improvement in the quality of audited information.

Different from the findings of Bouvatier & Lepetit (2008), this research comes up with meaningful evidence for earnings management in which banks with higher profitability levels have higher persistency in discretionary loan loss provisions or lower quality of external audit than those with lower profitability levels. In addition, all empirical estimates result in significantly positive coefficients on the interaction between CAR and ROE. These results illustrate that at the same level of CAR, banks with higher profitability levels had higher quality of external audit, i.e. the earnings management in these banks could be alleviated to some extent. It can be implied that despite only concerning about banks' capital levels, the EU capital regulations have also influenced earnings management practices of EU banks, as they would force those banks to be considerate of their capital levels when provisioning loan losses.

From the aforementioned pieces of evidence, it is reasonable to suggest that in overall, the quality of external audit in EU banks has been reduced under the capital regulations, which exacerbate discretionary behaviour towards meeting the ECB's expectations regarding their bank capital levels. However, there have been changes tightening the capital requirements in order to restrain EU banks from discretionarily provisioning loan losses, thus easing the deterioration in the quality of audited information.

Meanwhile, as illustrated in Table 6 and 4.2.2, the coefficients on the interactions of CAR and ROE with the natural logarithm of audit fees are significantly positive in some estimates including the full-specification ones. Although lacking consistency, those results provide some pieces of empirical evidence that more external audit efforts paid could alleviate capital and earnings managements, thus enhancing the quality of external audit. By contrast, there is no evidence for the direct influence of more paid audit efforts on the quality of external audit.

Table 6. Main estimates with the full sample

All five regressions with the dependent variable of AQ_OLS (constructed by the OLS residuals), the fixed cross-sectional effects and the control for time periods are preferred over those with random effects by Hausman test. The first two columns illustrate the estimates using the period dummies, whilst in the last three columns, the period control becomes more specific through using the interactions of the period dummies with CAR and lnAF. The fourth and fifth estimates respectively include more internal-audit factors and bank-risk factors. All regression results are reported with robust standard errors, after conducting Hausman test.

Dependent Variable:	(1)	(2)	(3)	(4)	(5)
AQ_OLS	FE0	FE1	FER2	FER3	FER4
Capital adequacy ratio (CAR, %)	0.0146 (0.009)	0.0410 (0.093)	-0.0363 (0.114)	-0.2008* (0.104)	-0.2131** (0.097)
The natural logarithm of audit fees (lnAF)	0.0642 (0.092)	0.0858 (0.157)	0.0944 (0.149)	-0.1326 (0.095)	-0.1240 (0.089)
Return on equity (ROE, %)	-0.0008*** (0.000)	-0.0188* (0.010)	-0.0162* (0.009)	-0.0179* (0.010)	-0.0190* (0.010)
c.CAR#c.lnAF		-0.0017 (0.006)	0.0000 (0.006)	0.0095* (0.005)	0.0097** (0.004)
c.ROE#c.lnAF		0.0010 (0.001)	0.0009 (0.001)	0.0011 (0.001)	0.0012* (0.001)
c.CAR#c.ROE		0.0004*** (0.000)	0.0003*** (0.000)	0.0002** (0.000)	0.0002** (0.000)
Period terms (with the base for the first period (2001 - 2005))					
2006-2012	-0.1542* (0.083)	-0.1398* (0.081)			
2013-2019	-0.2880*** (0.094)	-0.2781*** (0.095)			
(2006-2012)#c.CAR			0.0264 (0.035)	0.0402 (0.049)	0.0477 (0.049)
(2013-2019)#c.CAR			0.0620* (0.037)	0.0734 (0.048)	0.0828* (0.049)
(2006-2012)#c.lnAF			-0.0265 (0.024)	-0.0322 (0.033)	-0.0380 (0.033)
(2013-2019)#c.lnAF			-0.0670** (0.027)	-0.0699* (0.036)	-0.0785** (0.037)
Internal audit factors					
Non-audit fee ratio (%)				0.0005 (0.000)	0.0005 (0.000)
Audit committee independence (ACI)				-0.0006 (0.001)	-0.0005 (0.001)
Bank risk factors					
Leverage					-0.0017 (0.004)
Liquidity					-0.0006 (0.000)
Constant	-1.3386 (1.349)	-1.7005 (2.403)	-1.2648 (2.472)	2.4652 (1.749)	2.6886 (1.776)
F	6.0526	22.0723	19.6180	211.8698	395.0522
R-squared	0.0116	0.0207	0.0255	0.0619	0.0641
N	608	608	608	431	431

Standard errors in parentheses
(* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$)

Table 7. Robustness estimates with the full sample

All five regressions with the dependent variable of AQ_FE (constructed by the FE residuals), the fixed cross-sectional effects and the control for time periods are preferred over those with random effects by Hausman test. The first two columns illustrate the estimates using the period dummies, whilst in the last three columns, the period control becomes more specific through using the interactions of the period dummies with CAR and lnAF. The fourth and fifth estimates respectively include more internal-audit factors and bank-risk factors. All regression results are reported with robust standard errors, after conducting Hausman test.

Dependent Variable:	(1)	(2)	(4)	(5)	(6)
AQ_FE (Audit Quality)	FE0	FE1	FE2	FE3	FE4
Capital adequacy ratio (CAR, %)	0.0129 (0.009)	0.0360 (0.083)	-0.0350 (0.102)	-0.1836* (0.109)	-0.1972* (0.099)
The natural logarithm of audit fees	0.0521 (0.088)	0.0708 (0.144)	0.0799 (0.136)	-0.1211 (0.096)	-0.1042 (0.089)
Return on equity (ROE, %)	-0.0005* (0.000)	-0.0190** (0.009)	-0.0167* (0.008)	-0.0191* (0.010)	-0.0210** (0.010)
c.CAR#c.lnAF		-0.0015 (0.005)	0.0000 (0.005)	0.0081 (0.005)	0.0081* (0.005)
c.ROE#c.lnAF		0.0011* (0.001)	0.0010* (0.001)	0.0012* (0.001)	0.0013** (0.001)
c.CAR#c.ROE		0.0004*** (0.000)	0.0003*** (0.000)	0.0002** (0.000)	0.0002** (0.000)
Period terms (with the base for the first period (2001 - 2005))					
2006-2012	-0.1173 (0.077)	-0.1021 (0.075)			
2013-2019	-0.2349*** (0.086)	-0.2241** (0.087)			
(2006-2012)#c.CAR			0.0268 (0.028)	0.0458 (0.051)	0.0554 (0.051)
(2013-2019)#c.CAR			0.0576* (0.030)	0.0753 (0.049)	0.0882* (0.050)
(2006-2012)#c.lnAF			-0.0247 (0.019)	-0.0340 (0.035)	-0.0419 (0.035)
(2013-2019)#c.lnAF			-0.0598** (0.023)	-0.0670* (0.037)	-0.0794** (0.037)
Internal audit factors					
Non-audit fee ratio (%)				0.0005 (0.000)	0.0005 (0.000)
Audit committee independence (ACI)				-0.0005 (0.001)	-0.0002 (0.001)
Bank risk factors					
Leverage					-0.0036 (0.005)
Liquidity					-0.0007 (0.000)
Constant	-1.1594 (1.281)	-1.4766 (2.192)	-1.0788 (2.264)	2.2962 (1.799)	2.6509 (1.845)
F	3.2611	13.5620	11.8245	88.8772	125.3926
R-squared	0.0076	0.0186	0.0230	0.0516	0.0571
N	608	608	608	431	431

Standard errors in parentheses
(* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$)

4.3 The influence of the Single Supervision Mechanism on external audit quality

In the context of the Eurozone area, the process of regulating and supervising the banking system has not only been the implementations of international standards within a country, but also the practices of the single supervisor ECB for the whole banking system of the Eurozone EU member states. It is expected that the new framework of the Single Supervision Mechanism would yield favourable influence on the quality of external audit. As illustrated respectively in Column 1 and 2 of Table 8, the pooled cross-sectional and time series estimates with the regressands of AQ_OLS and AQ_FE result in statistically significant coefficients on the time dummy variable (SSM), indicating the deterioration of external audit quality from 2014 (relative to before 2014). Meanwhile, the evidence for the meaningful influence of being directly supervised by the ECB is not consistent, since only the estimate with the dependent variable of AQ_FE shows a positive coefficient on the treatment dummy variable at the significance level of 10%.

Table 8. Difference-in-difference estimates

	(1)	(2)
Dependent variable	AQ_OLS	AQ_FE
Supervised Group	0.0059 (0.105)	-0.0102 (0.100)
SSM	-0.4053*** (0.135)	-0.4117*** (0.129)
SSM-Treatment	0.2647 (0.161)	0.2875* (0.154)
Constant	-0.3051*** (0.087)	-0.2839*** (0.084)
F	4.5779	4.8054
R-squared	0.0177	0.0185
N	768	768

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

More than that, in order to answer the third research question, this research also looks into how the determinants of the external audit's quality behave between the two groups, in the two periods of pre-SSM and SSM, with the aim of identifying which aspects have been improved to provide a better quality of external audit through the ECB's direct supervision. It is worth noting that due to the division into four

subsamples, the numbers of observations in the less significant groups are not enough to satisfy the degrees of freedom in the models with the full specification. Therefore, based on the F-statistics, the research decides to relax the period dummy interactions which would be omitted in the SSM subsamples' estimates, and bank-risk factors. The results of the regressions with the dependent variable of AQ_OLS are illustrated in Panel A of Table 9, together with the tests of difference in coefficients across the subsamples in Panel B of the same table.

It is clear that before the SSM regime, the determinants of the external audit's quality had behaved in the less significant and significant banks differently. More specifically, within the less significant banks, more capitalised banks would have a better quality of external audit than less capitalised one, whereas within the significant banks, the quality of external audit would be lower in banks with higher capital ratios, thus implying the practice of capital management. Similarly, the practice of earnings management is not proved within the less significant banks since the results indicate that banks with higher profitability levels would possess a better audit quality, whilst there is no statistically meaningful evidence for this discretion amongst the significant banks. Nonetheless, the empirical results depict there could be external audit's compromises on the degrees of capital management and earning management within the less significant banks. By contrast, the external audit in the significant banks showed the effort on mitigating capital management, despite accepting a higher level of persistence of discretionary loan loss provisions in exchange for higher paid fees. These differences in the way of determining the quality of external audit performed in the two groups before the SSM are statistically significant, as illustrated in the first column of Panel B.

Table 9. Main estimates with subsamples

Panel A: Panel-data analyses on subsamples					
	Pre-SSM = 0		SSM = 1		
	(1) Less sig. = 0	(2) Significant = 1	(3) Less sig. = 0	(4) Significant = 1	
Capital adequacy ratio (CAR, %)	0.6335* (0.277)	-0.3135* (0.164)	0.1974 (0.155)	-0.0228 (0.207)	
The natural logarithm of audit fees	0.5925 (0.331)	-0.2549** (0.102)	-0.1444 (0.215)	-0.1727 (0.236)	
Return on equity (ROE, %)	0.3504** (0.106)	-0.0272 (0.018)	0.0433 (0.096)	-0.2475 (0.172)	
c.CAR#c.lnAF	-0.0392** (0.016)	0.0176* (0.009)	-0.0089 (0.010)	0.0010 (0.013)	
c.ROE#c.lnAF	-0.0190*** (0.005)	0.0019 (0.001)	-0.0036 (0.008)	0.0143 (0.011)	
c.CAR#c.ROE	-0.0046 (0.003)	0.0001 (0.000)	-0.0000 (0.002)	0.0011 (0.002)	
Non-audit fee ratio (%)	-0.0028 (0.002)	0.0007* (0.000)	0.0027 (0.002)	-0.0001 (0.001)	
Audit committee independence (ACI)	-0.0022 (0.002)	-0.0000 (0.002)	0.0038* (0.002)	0.0046 (0.005)	
Constant	-9.6096* (5.012)	4.1606** (1.727)	0.3729 (3.081)	2.0943 (3.703)	
F	1767.1935	826.7500	163.1196	12.9765	
R-squared	0.2634	0.1297	0.3511	0.0593	
N	55	190	45	141	
Panel B: Tests of difference in coefficients across subsamples					
Regression columns	(2) - (1)	(3) - (1)	(4) - (3)	(4) - (2)	[(4)-(3)]- [(2)-(1)]
CAR coeff. diff.	-0.947***	-0.4361*	-0.2202	0.2907	0.7268*
χ^2	10.83	2.83	0.75	1.05	3.58
P-value	0.001	0.0924	0.387	0.3053	0.0585
lnAF coeff. diff.	-0.8474***	-0.7369*	-0.0283	0.0822	0.8191
χ^2	6.87	3.44	0.01	0.07	2.61
P-value	0.0087	0.0638	0.9422	0.7942	0.1063
ROE coeff. diff.	-0.3776**	-0.3071*	-0.2908*	-0.2203*	0.0868
χ^2	10.65	3.53	2.86	2.98	0.18
P-value	0.0011	0.0604	0.091	0.0842	0.6756
c.CAR#c.lnAF coeff. diff.	0.0568***	0.0303*	0.0099	-0.0166	-0.0469**
χ^2	11.29	3.7	0.38	0.93	4.05
P-value	0.0008	0.0545	0.5397	0.3337	0.0442
c.ROE#c.lnAF coeff. diff.	0.0209***	0.0154	0.0179	0.0124	-0.003
χ^2	10.47	1.76	2	2.32	0.04
P-value	0.0012	0.185	0.1576	0.1275	0.8373
c.CAR#c.ROE coeff. diff.	0.0047*	0.0046	0.0011	0.001	-0.0036
χ^2	3.62	1.83	0.13	0.25	0.81
P-value	0.0571	0.1758	0.7134	0.6178	0.3689
Non-audit fee coeff. diff.	0.0035**	0.0055**	-0.0028	-0.0008	-0.0063**
χ^2	5.75	5.21	1.66	0.58	5.74
P-value	0.0165	0.0225	0.197	0.4475	0.0166

Robust standard errors in parentheses
(* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$)

By contrast, as represented in Column 3 and 4 of Panel A, the influencing powers of all determinants are no longer statistically significant in both bank groups over the SSM period, with the exception of that of the audit committee independence indicator. In addition, the differences in the determinants' behaviours of influencing the quality, except for ROE's, between the two bank groups are statistically insignificant in the SSM period, as illustrated in the third column of Panel B. This indicates the convergence of those influences on the quality of external audit between in less significant banks and in significant banks over the SSM period.

Considering the changes in the way of influencing the quality within the bank groups between the pre-SSM and SSM periods, the difference tests in the second column of Panel B illustrate significantly unfavourable changes in the influences of CAR, ROE and the natural logarithm of audit fees on the quality within the less significant group. Meanwhile, the determining behaviours of all influencers, except for ROE, remained unchanged over these two periods within the significant group, as represented in the fourth column of Panel B. Last but not least, as shown in the last column of Panel B, the tests on differences in coefficient differences aim to check the significance of changes in the influences on audit quality performed in the significant banks, relative to those performed in the less significant banks, between the pre-SSM and SSM periods, thus showing how the SSM framework has been affecting the quality of external audit. More particularly, the statistically significant positive difference in CAR coefficients' differences implies that the ECB's oversight of the significant banks could directly eliminate the practice of capital management in which the enhancement of CAR is associated with discretionarily provisioning practices, thus improving the quality of audited expected losses information reported by those banks. However, this oversight has failed to induce the capability of high payments for auditing effort to alleviate capital management practices in the significant banks, as evidenced by the statistically significant negative difference in differences of the coefficients on the interaction between CAR and the natural logarithm of audit fees.

In addition, it is noticeable that before the SSM regime, the influence of non-audit services on the quality of external audit was stronger in the significant banks than in the less significant banks, which is proved by the significantly positive difference in non-audit fee ratio' coefficients (in the first column of Panel B). However, the

competitive advantage effectiveness of non-audit services in providing true and fair accounting information in the significant banks, in comparison with in the less significant banks, has been cancelled out and even worsened under the SSM framework, since the result of difference in non-audit ratio's coefficients differences is negative at the significance level of 5%.

As represented in Table 10, the results from the robust estimates with the dependent variable of AQ_FE also support the differences in the behaviours of most of the influencers on the quality of external audit between the less significant banks and the significant banks before the SSM period, despite providing the magnitude and significance of estimated coefficients different from the main estimates with the dependent variable of AQ_OLS. Nevertheless, from the fourth column of Panel B in Table 10, it is noticed that the positive impacts of the SSM framework are no longer statistically significant, whereas the only negative impact on the effectiveness of non-audit services is still significant at 5% in the robust estimates.

Table 10. Robust estimates on subsamples

Panel A: Panel-data analyses on subsamples					
	Pre-SSM = 0		SSM = 1		
	(1)	(2)	(3)	(4)	
	Less sig. = 0	Significant = 1	Less sig. = 0	Significant = 1	
Capital adequacy ratio (CAR, %)	0.4841 (0.349)	-0.3043* (0.170)	0.4026** (0.162)	0.0336 (0.218)	
The natural logarithm of audit fees	0.2595 (0.374)	-0.2365** (0.110)	0.0123 (0.209)	-0.0947 (0.305)	
Return on equity (ROE, %)	0.2767* (0.135)	-0.0258 (0.017)	0.0666 (0.089)	-0.2126 (0.146)	
c.CAR#c.lnAF	-0.0289 (0.020)	0.0171* (0.010)	-0.0228* (0.011)	-0.0028 (0.013)	
c.ROE#c.lnAF	-0.0146** (0.006)	0.0018 (0.001)	-0.0064 (0.007)	0.0126 (0.010)	
c.CAR#c.ROE	-0.0043 (0.004)	0.0001 (0.000)	0.0016 (0.001)	0.0009 (0.002)	
Non-audit fee ratio (%)	-0.0022 (0.002)	0.0005 (0.000)	0.0034 (0.002)	0.0000 (0.001)	
Audit committee independence	0.0008 (0.003)	-0.0001 (0.002)	0.0020 (0.002)	0.0034 (0.005)	
Constant	-4.8885 (5.528)	3.8817** (1.847)	-1.8457 (3.087)	1.0183 (4.876)	
F	7029.8648	211.0215	243.1183	7.0704	
R-squared	0.2037	0.1194	0.4091	0.0458	
N	55	190	45	141	
Panel B: Tests of difference in coefficients across subsamples					
Regression columns	(2) - (1)	(3) - (1)	(4) - (3)	(4) - (2)	[(4)-(3)]- [(2)-(1)]
CAR coeff. diff.	-0.7884***	-0.0815	-0.369	0.3379	0.4194
χ^2	6.98	0.08	1.94	1.42	1.11
P-value	0.0082	0.771	0.1633	0.2341	0.293
lnAF coeff. diff.	-0.496	-0.2472	-0.107	0.1418	0.389
χ^2	2.16	0.35	0.07	0.19	0.54
P-value	0.1419	0.5535	0.7938	0.665	0.4633
ROE coeff. diff.	-0.3025**	-0.2101	-0.2792*	-0.1868	0.0233
χ^2	4.92	1.38	2.86	2.52	0.01
P-value	0.0265	0.24	0.0907	0.1123	0.9134
c.CAR#c.lnAF coeff. diff.	0.046***	0.0061	0.02	-0.0199	-0.026
χ^2	6.98	0.13	1.45	1.33	1.16
P-value	0.0083	0.7194	0.229	0.2496	0.2824
c.ROE#c.lnAF coeff. diff.	0.0164**	0.0082	0.019	0.0108	0.0026
χ^2	4.54	0.43	2.36	2.05	0.03
P-value	0.033	0.5099	0.1245	0.1518	0.8574
c.CAR#c.ROE coeff. diff.	0.0044	0.0059	-0.0007	0.0008	-0.0051
χ^2	2.29	2.46	0.05	0.18	1.46
P-value	0.1306	0.1171	0.8251	0.6685	0.2275
Non-audit fee coeff. diff.	0.0027*	0.0056**	-0.0034	-0.0005	-0.0061**
χ^2	2.73	4.54	2.2	0.25	4.71
P-value	0.0985	0.0331	0.138	0.6195	0.03

Robust standard errors in parentheses
(* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$)

4.4 Policy implication

In light of the findings, it is sensible to suggest that the EU banking capital requirements have had an undesirable impact on the quality of external audit because the prolonging pressure to achieve regulatory capital levels has induced discretionary practices on provisioning loan losses. On the other hand, the changes in the EU banking regulations, which could be divided into the three periods of implementing the international banking regulations and supervisions (Basel Accords), have been effective in mitigating those discretions, but not eliminating them, thus improving the quality of audited information to some extent. Meanwhile, the specific scheme of the Single Supervisory Mechanism in the EU banking system has been of benefit to the quality of external audit through restraining the significant banks from practicing discretionary capital. However, under this oversight, the effectiveness of both audit and non-audit services in enhancing the quality of audited information has been reduced at the significant banks. The reason might come from the concentration of the EU banking regulations and supervisions, as well as the SSM framework, on EU banks' capital levels, rather than on monitoring the responsibility of external audit in providing true and fair accounting information.

From this viewpoint, it could be better for the EU banking system, especially the less significant banks, if the ECB supervises and regulates the responsibility of companies providing auditing and accounting services for financial institutions, especially in the case that the costs for the ECB's control on these service companies are smaller than those for the ECB's direct supervisions on all banks. By doing so, it might not only improve the quality of audited information at the less significant banks, but also correct the negative impact of the direct supervision on the effectiveness of auditing services at the significant banks, as the process of obtaining information of external audit will be supervised, and the independence and objectivity of external auditors will be protected by the regulators.

5 CONCLUSION

In the interests of the stability and resilience of the EU banking system, stringent capital regulations in accordance with Basel II and Basel III have been put forth since 2006 in order to replace the Capital Adequacy Directive. These requirements have not only rendered the banks' exposure estimates more complex, but also given banks' managers more motivation and space to practice managerial discretions regarding loan loss provisions. As a result, there has been a higher pressure on external auditors to have a good understanding of the new and intricate internal assessment systems that are used for categorising assets and evaluating the risks of asset portfolios. If discretionary practices go unnoticed by the external auditors, the financial difficulties of the audited banks will not be reflected in the audited consolidated financial statements. As discussed in 1.1.2, indeed, external auditors have consecutively failed in their role as an independent mediator between managers and stakeholders. However, it is unclear as to how more stringent banking regulations and supervisions in the EU banking system will affect the quality of reported loan loss provisions by external audit. Finding the answer to this has another potential impact: showing a proof for the necessity of governmental interventions in managing the external audit's creditability of financial information.

With the aim of uncovering how banking capital regulations and supervisions from 2001 to 2019 affected the quality of audited financial information within the EU banking system, this research firstly discovered managerial discretions in loan loss provisioning through estimating discretionary LLPs (DLLPs), which were then used for determining the proxy for audit quality. Secondly, this research applied panel-data analysis to regress capital requirements, the cost of external audit, and bank-specific characteristics on audit quality. The three regimes in which the legislation for the European banking system was divided (i.e. pre-2006, 2016-2012, and post-2013) were treated as dummy variables for period, interacting with capital adequacy ratios and the natural logarithm of external audit. This analysis aimed to discover the followings: the influences of capital and earning managements on audit quality, the extent to which such influences were constrained by paid efforts of external audit, and the impact of more stringent banking regulations and supervisions on audit quality. Thirdly, this research attempted to uncover how the Single Supervisor Mechanism (SSM) impacted

the European banking system by carrying out a Difference in Difference estimation between two groups: banks that have been considered to be less significant and be significant by the European Central Bank. This third step also conducted panel-data estimations on sub-samples, in order to find out how much the Central Bank's supervision affected the audit quality.

Regarding the first research question, the full sample analysis of the panel-data revealed at first sight that more stringent capital regulations from the EU has had an undesirable effect on the quality of audited information (in terms of loan loss provisions) and has rendered auditing costs less effective in bringing about true and fair views on LLPs. Nevertheless, the capital requirements under Basel III have served their purpose of attenuating managerial discretions in terms of provisioning loan losses (compared to those in Basel I). This has helped moderately improving the quality of audited information. The sub-sample analyses showed that before the SSM period, there were differences in the behaviours of most of the factors that affected external audit's quality, between the two groups of less significant and significant banks. The SSM scheme in the EU banking system has benefited the external audit's quality by hindering the significant banks' discretionary capital practices. Nonetheless, under this superintendence, the significant banks have seen both audit and non-audit services decreased their effectiveness in improving audited information's quality.

Albeit acknowledging that the limitation in the data size could have biased the findings, this research is expected to provide a moderate contribution by providing an analytical insight into the impacts of the banking regulations and supervisions on the performance of external audit in the EU banking system. Through the analytical findings, it is advised that it might be beneficial for the performance of external audit in both significant and less significant banks as the companies providing audit and non-audit services are under governmental regulations and supervisions, if the cost of this is lower than the direct supervisions on both bank groups.

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