Non-audit valuation services prohibition and fair value measurements: evidence from European Union banks

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Abstract

This paper investigates the impact of valuation non-audit services (NAS) prohibition on the use of fair value measurements (FVMs) by European public banks. We use a difference-in-differences approach and exploit the European Union (EU) Audit Reform prohibiting valuation NAS. The findings provide evidence that EU banks significantly reduced the use of FVMs, particularly fair value Level 3, following the Reform. The decrease is more pronounced for banks audited by non-Big4 firms and banks with higher non-performing loan ratios. The findings suggest that the Reform led to increased audit and preparation costs, and heightened risks associated with FVMs. This study contributes to the auditing literature on the role of NAS in supporting complex FVMs and on how the separation of auditing and consulting functions affects FVMs use. The research also contributes to the literature on the effects of audit reforms and the role of NAS in financial reporting, particularly in the banking industry, where FVMs are critical for regulatory compliance and market confidence. The research offers insights for ongoing post-implementation reviews of the EU Audit Reform and highlights an unintended consequence of regulations aimed at enhancing auditor independence.

1. Introduction

In recent years, audit concerns involving fair value measurements (hereafter FVMs) have taken the centre stage in the academic and practitioners' debate (McDonough et al., 2020; Barr-Pulliam et al., 2023). FVMs have grown increasingly complex and material in financial statements, so that financial statements preparers often lack the necessary expertise and rely on assistance by auditors providing non-audit valuation services¹, where allowed, and/or by valuation specialists (Bratten et al., 2013; Hux, 2017; PCAOB, 2018). This paper investigates whether the prohibition of valuation non-audit services (hereafter valuation NAS) is associated

¹ Valuation services hold a prominent position in the financial advisory market, with the global market valued at approximately \$18 billion in 2023 (Shaffer, 2023; Alexandris et al., 2024; Huxley et al., 2024; Marketsharepulse, 2024). These services cover valuations for financial reporting, merger, and acquisitions (M&A), real estate and other assets.

to lesser or greater use of FVMs. To this purpose, we examine the effect of the European Union Audit Reform, prohibiting valuation non-audit services, on the EU public banks' use of FVMs.

There are at least two reasons of interest for this research. First, fair value in the current banking financial reporting environment is crucial for market confidence and functioning, as well as for regulatory compliance (McDonough et al., 2020). NAS provide essential specialist knowledge for complex and risky FVMs (Bratten et al., 2013). It is thus interesting to explore how NAS provision or prohibition influences the use of FVMs. Prior research examined the association between FVMs and audit fees in the U.S. banking industry, providing evidence that greater use of FVMs for financial instruments triggers increased audit fees (Ettredge et al., 2014). This research examined a post-SOX sample, when NAS were already prohibited in the U.S. To the best of our knowledge, we are not aware of any published evidence on the relation between NAS and use of FVMs.

Second, past research has raised concerns about auditor independence in banks (Kanagaretnam et al., 2010) and advocated more research on auditing in banks and its implications (Lobo, 2017). The EU Audit Reform prohibits most types of non-audit services, primarily addressing auditor's independence issues (Castillo-Merino et al., 2017). Regulators are currently undertaking post-implementation reviews of the new regulation (e.g., IAASB 2021; PCAOB 2022; EC, 2022). This paper timely addresses the issue, focusing on banks in bank-based European Union economies.

Ex ante, the relationship between NAS prohibition and use of FVMs is ambiguous. On the one hand, separating consulting and auditing may lead to greater use of FVMs. Gaver & Paterson (2014) finds that separating auditing and NAS functions related to actuarial services implies higher audit quality in the insurance industry. NAS prohibition avoids the risk that auditor and preparer use the same specialist (hired through NAS) or that audit firm serves as consultant and auditor, in both cases impairing the auditor's independence. The clear separation of roles between auditor and preparers' specialist consultant ensures more robust independent audit and increases market confidence (Bratten et al., 2013). Under a "market confidence" perspective, if NAS prohibition improves audit and financial reporting discipline, and increases market confidence, then banks may be more inclined to use complex but informative measurements (McDonough et al., 2020). While the reform itself does not mandate an increase in the use of fair value measurements, the EU Commission expected that improving audit quality could encourage banks and firms to adopt FVMs more frequently, particularly where fair values are deemed more relevant than historical costs (EC,

2011)². The expectation is that with enhanced oversight and reporting, companies may feel more confident in utilizing fair value accounting practices, knowing that they will be subject to rigorous audit scrutiny.

On the other hand, NAS prohibition can bring additional preparation costs and audit costs, s as well as financial reporting risks for preparers, due to reduced knowledge spillover from auditors and tighter scrutiny by more independent auditors. The Reform hinders the knowledge spillover that reduces the complexity of auditing FVMs and increases audit efficiency (De Simone et al., 2015). Without valuation advisory and with more independent auditors, managers could reduce the use of FVMs to avoid risks of errors and misstatements, as well as to save costs. An increase in audit risks may in fact result in higher audit fees (Ettredge et al., 2014). Also, separation of auditing and consulting implies the need to hire a specialist consultant, while still paying relevant audit fees, because audit firms in any case charge valuation services necessary to audit FVMs (Bratten et al., 2013). Under a "risks & costs" perspective, if NAS prohibition reduces knowledge spillover, increases auditor independence, and leads to additional financial reporting risks, preparation costs, and audit costs, then banks may reduce FVMs use.

This research uses the cross-section of Orbis BankFocus database and Worldscope, to build a global sample of public banks. We focus on public banks because controls for the auditor type (Big4 or not) and for the auditor fees are available worldwide only through Worldscope for these banks. Our analyses sample data cover the period 2015-2019. We classify our sample banks in four groups: a) banks headquartered in EU Member States; b) banks headquartered in European Non-EU Countries (Iceland, Liechtenstein, Montenegro, Norway, Russian Federation, Serbia, Switzerland, Turkey, Ukraine); c) banks headquartered in the rest of the world (Global), i.e., countries different from the above; d) banks headquartered in the U.S.. Our treated sample is given by the EU banks. We alternatively use as controls the European Non-EU banks and Global banks, and we use for further investigations a comparison with U.S. banks., as sample treated 10 years before the EU banks.

The empirical analyses provide evidence that banks significantly decreased their FVMs after the implementation of the EU Audit Reform, compared to the control samples. The decreasing effect is more significant for fair value level 2 and especially fair value level 3. Further investigations do not find evidence of anticipatory behavior with EU banks reducing FVMs after the announcement of the EU Audit Reform (in 2014, two years before the implementation). Further analyses also find evidence that EU banks audited by Non-Big4 audit firms reduce their level 3 FVMs more than banks audited by Big4 auditors. EU banks with higher NPLs ratio increased their FVM level 1 and decreased

² "Fair value valuation and going concern validations are specific areas where investors believe the use of professional scepticism should be improved" (EC., 2011, p. 69).

their FVM level 3 after the Reform. The findings suggest that the Reform increased the preparation and auditing costs of FVMS, and heightened the risks of error and misstatements. They provide evidence regarding an unintended consequence of regulation aiming at strengthening the auditors' independence in the EU context.

This paper aims at contributing to prior literature on the consequences of audit reforms. Prior studies find evidence that audit reforms improve stock markets liquidity (Ernstberger et al., 2012) or debt financing (Lisowsky et al., 2017; Balakrishnan et al., 2021). Our study shows that audit reforms can influence the use of FVMs by banks. Furthermore, the paper contributes to prior auditing literature in the banking industry with evidence on the effect of a specific type of NAS (i.e., valuation services) on banks' accounting behavior, answering to call for research on the topic (Gaver & Paterson, 2014; Lobo, 2017). Finally, the paper can contribute to the literature on fair value accounting with evidence on how audit influences the use of fair value measurements (McDonough et al., 2020). It suggests that prohibiting NAS valuation services limits a knowledge spillover which serves the use of FVMs in the banking industry.

This paper has policy implications, as it informs regulators and market participants on the effectiveness of the EU Audit Reform. Regulators are currently undertaking post-implementation reviews of the new regulation to assess its effectiveness (e.g., IAASB 2021; PCAOB 2022; EC, 2022). However, there is limited knowledge on the Reform's effect on banks in bank-based European economies.

The remainder of the paper is organized as follows. Section 2 describes the EU Audit Reform institutional setting. Section 3 includes the literature review, while Section 4 develops the hypothesis. Section 5 describes the research methodology and Section 6 includes the empirical findings. Section 7 concludes.

2. Institutional Setting

The EU Audit Reform, enacted in 2014, aimed to address key concerns in auditing practices, related to auditors' independence and to the audit firms' supervision across the EU (EC, 2011, p. 9). This Reform emerged from an extensive consultation process involving various stakeholders, including audit firms, investors, Member States, and EU bodies (Lelieveldt and Princen, 2023; Wallace et al., 2020). Designed to enhance auditor independence and improve financial reporting transparency, the Reform introduced several new requirements, including mandatory audit firm rotation, stricter audit reporting, and prohibitions on certain non-auditing services (NAS) (Sun and Habib, 2021).

Before the Reform, the regulation on NAS provision was guided by the Statutory Audit Directive, which recommend audit firms to refrain from providing NAS if an objective, reasonable, and well-informed observer might view such services as potentially compromisers of auditor independence (art. 22, Directive 2006/43/EC). However, this guideline served more as a general principle rather than a strict prohibition, allowing for varied interpretations across Member States (Ratzinger-Sakel and Schönberger, 2015).

The Reform primarily targets Public Interest Entities (PIEs), which face more stringent audit requirements due to their significant economic and societal roles. PIEs include entities listed on a regulated market within the EU, credit institutions, and insurance companies (see Directive 2013/34/EU – the "Accounting Directive" and Directive 2014/56/EU – the "Audit Directive")³. Article 8 of the Regulation 537/2014 states that the provision of NAS by statutory auditors, audit firms, or members of their networks may compromise their independence, "therefore, it is appropriate to prohibit the provision of certain non-audit services such as specific tax, consultancy, and advisory services to the audited entity, its parent undertaking, and its controlled undertakings within the Union".

The NAS prohibitions under the EU Audit Reform are similar to those outlined in the Sarbanes-Oxley Act (SOX). Article 5 of the Regulation 537/2014 details the non-audit services to be prohibited, which includes: tax services; bookkeeping and preparing accounting records and financial statements; payroll services; designing and implementing internal control, risk management and information systems related to preparation and control of financial information; valuation services (including appraisal or valuation services, fairness opinions or contribution-in- kind reports); actuarial services; legal services; services linked to the financing, capital structure and allocation, and investment strategy or involving any part in the management or decision-making of the audited entity⁴.

The new regulation allows Member States to derogate from the prohibition of certain tax and valuation services if "they have no direct or have immaterial effect, separately or in the aggregate on

³ The EU defines PIEs as: "(a) entities governed by the law of a Member State whose transferable securities are admitted to trading on a regulated market of any Member State within the meaning of point 14 of Article 4(1) of Directive 2004/39/EC; (b) credit institutions as defined in point 1 of Article 3(1) of Directive 2013/36/EU of the European Parliament and of the Council, other than those referred to in Article 2 of that Directive; (c) insurance undertakings within the meaning of Article 2(1) of Directive 91/674/EEC; or (d) entities designated by Member States as public-interest entities, for instance undertakings that are of significant public relevance because of the nature of their business, their size or the number of their employees."

⁴ In addition, other services prohibited are working capital management, providing financial information, business process optimisation, cash management, transfer pricing, supply chain efficiency. Overall, any service involving taking part in management or decision-making of the audited entity are prohibited. Exceptions are due diligences services, comfort letters and other assurance services.

the audited financial statements" (Art. 5 Regulation 537/2014)⁵. However, derogation is excluded for NAS related to fair value measurements, which would have fallen into the prohibition of bookkeeping and preparing accounting records and financial statements in any case (KPMG, 2016).

Beyond NAS prohibitions, the Reform introduced mandatory audit rotation and quality assurance requirements for audit firms. Among the others, it extended the auditing reporting requiring explanations of key audit matters (KAMs) to improve transparency. The Reform also established a new mechanism for the adoption of International Standards on Auditing (ISAs) into the EU regulatory framework and introduced the Committee of European Auditing Oversight Bodies (CEAOB). After the Reform, the IAASB's revised ISA 701 in 2015, aligning with the new rules (IAASB 2015, ISA 701).

Among European Countries, Germany had regulation prohibiting valuation and actual services prior to the Reform (German Commercial Code, § 319a(1)2–3 HGB; see also Dobler, 2014). For this reason, we exclude German banks from our treated sample. Prior to the Reform, France had deontological rules advising auditors not to provide several NAS, with mandatory disclosure of the NAS provided (Ratzinger-Sakel and Schonberger, 2014). Similarly, UK had the Ethical Standard for Auditors ES5 recommending auditors not to undertake certain NAS, including valuation and actuarial services, but no formal prohibition. Like France, UK required mandatory disclosure of NAS provided (Ratzinger-Sakel and Schonberger, 2014). It is important to note the UK referendum on Brexit took place in 2016, the same year the EU Audit Reform was implemented. Shortly after the referendum, the UK government began negotiations to exit the EU. This may be a confounding event for our study on the application of EU audit regulations. In Section 6, we examine the FVMs usage patterns in both treated and control Countries. UK displays a pattern similar to non-EU control countries. For this reason, we run our analyses with and without UK included in our sample of treated Countries.

Sun and Habib (2021) reviews audit reforms worldwide that restrict or prohibit NAS. South Korea implemented an audit regulation change in the same years of the EU Audit Reform, adopting similar NAS prohibitions. Our descriptive statistics show that South Korean banks display an FVMs usage pattern similar to the EU Countries in our treated sample. We exclude this country from our global control sample.

3. Literature Review

⁵ Such activities are to be in any case approved by the audit committee and disclosed in the audit committee report. So, for example, a due diligence on a potential target of an M&A would be allowed, while advisory and valuation services during and after an M&A not.

Since the adoption of fair value⁶ accounting, both regulators and academics never stopped expressing concerns about accounting and assurance of FVMs, considered highly subjective and susceptible to management bias and opportunism (Christensen et al., 2012; Bratten et al., 2013; Barr-Pulliam et al., 2023; PCAOB, 2018; SEC, 2020). In the U.S., PCAOB inspections describe a number of judgment deficiencies related to the audits of fair values and other estimates (Bratten et al., 2013). Bratten et al., (2013) classifies environmental, task and auditor-specific factors affecting the audit of FVMs. Valuation knowledge and expertise are a crucial auditor characteristic, and regulatory agencies and others explicitly cite this characteristic as primary contributor to audit concerns involving fair values and other estimates (PCAOB, 2009; IAASB, 2011)

Prior studies suggest that valuation services are especially important for banks due to the use of complex financial instruments, such as derivatives and securities, which require sophisticated fair value measurements (Landsman, 2007; Lobo, 2017). Furthermore, they are essential in ensuring banks' compliance with regulatory requirements, such as capital adequacy assessment and risk management (e.g., Magnan, 2009; Valencia & Smith, 2013; Mies, 2024; Zheng and Wu, 2023). Despite the growing challenges auditors face in assessing FVMs due to the rise of fair value accounting and complex financial instruments (Ettredge et al. 2014; Doliya and Singh, 2015), prior literature indicates that auditors are increasingly influential in determining both the inputs and outcomes of banks' fair value estimates. This evolution has expanded the traditional scope of auditors' role, requiring greater judgment in assessing subjective valuations (Doliya and Singh, 2015). As a result, auditors are often preferred by banks over other valuation services providers due to their extensive industry knowledge, perceived integrity, and deep understanding of client's firm (Westland and Westland, 2020; Eilifsen et al., 2021).

The auditors' advisory role in fair value measurements (FVMs) is not only crucial in its assessment but also in the estimation process itself. FVM level 1 uses "directly observable inputs", such as quoted prices for identical assets which can be derived from active markets and is considered the most reliable for fair value measurement (Yao et al., 2017). FVM level 2 relies on quoted market prices for similar assets and liabilities and other (indirectly) observable inputs like interest rates. FVM level 3, which offers the most discretion, depends on unobservable inputs provided by the firm. Discretion increases from level 1 to level 3, making level 3 estimates desirable only when inputs for level 1 and level 2 are unavailable (McDonough et al., 2020). Evidence suggest that bank managers make use of this discretion to manipulate earnings, reducing the transparency of their financial

⁶ Both US GAAP and IFRS use fair value as a measurement (and remeasurement) basis. Both the FASB and IASB have standardized the definition fair value, describing it as an exit price – "[t]he price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date" (ASC 820 and IFRS 13; see: McDonough et al., 2020). See also IFRS 13, Fair Value Measurement (IASB, 2011).

statements for the capital markets (Yao et al., 2017). Ettredge et al. (2014) find a positive association between audit fees and the proportion of fair-valued assets, which is stronger for assets valued using Level 3 inputs, suggesting higher audit risk. Chen (2022) finds that investors value audit quality for complex estimates, particularly for Level 3 fair value assets, with auditor industry expertise being a crucial factor. Furthermore, banks with greater exposure to FVMs and with industry specialist auditors tend to engage less in loan loss provision-based earnings management, while being more likely to engage in transaction-based earnings management (Bratten et al., 2016).

Prior literature suggests that the complexity of fair value estimates affects the auditors' behavior in several ways. Some studies suggest that auditors may be influenced by the clients' subjective fair value inputs, reducing efforts when evidence is highly quantified (Joe et al., 2015). Other studies suggest that auditors increase their efforts in assessing complex FVMs and develop specialized expertise in fair value audits, which contribute to improved fair value reliability, and increase the value relevance of less objectives fair value disclosures, e.g. level 3 (Ahn et al., 2020). Methodological intricacies involved in fair value estimates also may lead auditors to rely on external specialists, which is necessary to ensure accurate expertise and judgment, given the inherent subjectivity, uncertainty, and limited comparability associated with these estimates (Griffith et al., 2015; Griffith et al., 2021; Hux, 2017)⁷.

Noteworthy, prior research examining the relation between FVMs and audit fees is based on the U.S. banking industry and on post-SOX sample, when NAS valuation services were already prohibited, and fair value accounting was not yet codified (Barr-Pulliam et al., 2023). To the best of our knowledge, no prior study examined the relation between NAS and FVMs in the banking industry, despite such services are those more likely affecting bank's FVMs use. In the following paragraph, we develop our research hypothesis that relates non-audit valuation services prohibitions with the use of FVMs.

4. Hypothesis Development

The relationship between non-audit valuation services prohibition and use of FVMs is ex-ante ambiguous. On the one hand, separating valuation advisory and auditing may lead to an increased use

⁷ In providing valuation advice to their clients, auditors can either rely on internal experts or, alternatively, hire external valuation specialists (Bratten et al., 2013; Glover et al., 2017; Boritz et al., 2020; Brown et al., 2020; Griffith and Hammersley, 2021). In both the cases, it is essential that auditors follow principles of professional judgment, which is described as the capacity to evaluate audit risk, and allocate resources effectively, integrating knowledge and expertise with legal and ethical guidelines to deliver informed opinions and decisions to clients (Addison and Mueller, 2015; Gao and Zhang, 2019). Indeed, even when external experts handle crucial elements of fair value auditing, auditors remain accountable for the final conclusions (Griffith, 2015).

of FVMs. Prior studies suggest that when auditors provide valuation services in addition to statutory audit services, there can be an impairment of the auditors' judgment and independence attributable to self-interest biases, familiarity threats, and the potential for future NAS revenues (e.g., Carcello et al., 2020; Causholli et al., 2015; Quick et al., 2015). Auditors providing valuation services may focus on meeting client expectations and fostering long-term relationships, thus reducing their independence (Koch and Salterio, 2017; Hatfield et al., 2011). Studying a relevant fair value measurement, researchers find that higher NAS fees are associated with delayed goodwill impairment recognition and lower impairments amount, particularly among those clients having greater incentives to influence auditors (Carcello et al., 2020). Kanagaretnam et al. (2010) find that abnormal audit fees (NAS included) are associated to greater earnings management in small banks.

Clearly separating the role of auditors and external consultants, a more rigorous and independent audit process can be ensured, increasing market confidence (Bratten et al., 2013). It also avoids that both the audit company and the client rely on the same external expert, thereby reducing a careful review of fair value measurements (PCAOB, 2011). Supporting this view, Gaver & Paterson (2014) finds that separating auditing and NAS functions related to actuarial services implies higher audit quality in the insurance industry. If NAS prohibition improves audit and financial reporting discipline, increasing market confidence, then banks may be more inclined to use complex but informative measurements (McDonough et al., 2020).

On the other hand, prohibiting NAS can bring externalities for preparers related to reduced knowledge spillover from auditors, and additional financial reports preparation and audit costs. "Auditor-provided non-audit services might improve financial reporting" (Gleason & Mills, 2011, p. 1484). If NAS generate knowledge spillover, "then information gained from providing such services can improve the audit and, hence, financial reporting" (Gleason & Mills, 2011, p. 1484). Consistent with this view, Krishnan et al. (2011) find that tax NAS are negatively related to earnings management. Krishnan et al. (2013) find that investors perceive the benefits of NAS (i.e., enhanced financial reporting quality due to knowledge spillover) to be greater than the potential threat to auditor independence caused by NAS. Earley et al. (2014) find that auditors are usually skeptical about the management's preferred fair-value classifications when aligned with management's reporting incentives. Friedman et al. (2021) show that banning NAS may reduce audit quality, especially where competition for NAS is high.

These studies suggest that insights and knowledge learned from auditors providing NAS may guide bank managers towards a more rigorous fair value accounting, encouraging additional disclosures and reducing client firms' misreporting and litigation risks (Yao et al., 2018). Yao et al. (2018) find evidence supporting the existence of a knowledge spillover, as they show that FVMs are more strongly associated to earnings persistence in banks audited by industry-expert auditors. The prohibition of NAS can limit the knowledge spillover that helps reduce the complexity of fair value audit, while enhancing audit efficiency (De Simone et al., 2015).

Without valuation advisory, managers could reduce the use of FVMs to avoid risks of errors and mismeasurements, as well as to save costs. Increases in audit risks generally result in higher audit fees (Ettredge et al., 2014). The separation of auditing and consulting might imply the need to hire a specialist consultant, while still paying relevant audit fees, as auditors will still charge for valuation services necessary for auditing FVMs (Bratten et al., 2013). Furthermore, disagreement between auditors and specialists increases costs, as specialists revalue the price when reworking (Barr-Pulliam et al., 2022). If valuation NAS prohibition increases costs and risks, banks should reduce the use of FVMs when such prohibition is implemented.

Based on the above considerations, we developed the following hypothesis:

HP1: The prohibition of valuation NAS influences the use of FVMs in the banking industry.

5. Research methodology

5.1 Data and Sample

This research uses the cross-section of BankFocus database and Worldscope, to build a global sample of public banks. We focus on public banks as controls for the auditor type (Big4 or not) and for the auditor fees are available worldwide only through Worldscope for public banks. Our analyses sample data cover the period 2012-2019. We start considering all available data on BankFocus in the period analyzed. Following Duprey & Le (2016), we selected the consolidation codes C1, C2 and U1, skipping U2 to avoid double counting (see also Overesch & Wolf, 2021). We then merge with Worldscope to obtain data on the auditor and the auditor's fees. Our final sample include 7,449 bank-year observations, with 1,019 unique banks.

We classify our sample banks in four groups: a) banks headquartered in EU Member States; b) banks headquartered in European Non-EU Countries (Iceland, Liechtenstein, Montenegro, Norway, Russian Federation, Serbia, Switzerland, Turkey, Ukraine); c) global banks headquartered in the rest of the world, i.e., countries different from the above; d) banks headquartered in the U.S.. We have 131 unique EU banks, 93 unique European Non-EU banks, 85 unique U.S. banks and 695 unique global banks. Our treated sample is given by the EU banks. We alternatively use as controls the European Non-EU banks and global banks. We also use as control U.S. as such banks were treated about a decade before the period we are analyzing, and the descriptive statistics show that they share the same trend in fair value measurement use of other control groups (see below descriptive statistics). As described in section 2, the agreement on the EU Audit Reform was closed in 2014 and became effective for financial years starting on or after June 2016. With fiscal year ending 31 December, EU banks must comply from 1 January 2017. We set our treatment year in 2017 in the main analyses (covering years 2015-2019). Further investigations seek for possible anticipatory behavior analyzing the period 2012-2016 with the treatment set in 2014. While possible to some extent, we believe that a fully anticipatory behavior is unlikely given the time frame allowed and the complex workload necessary to move from auditor-provided valuations services to other specialists. Hence the main effect should be expected after 2016.

5.2 Research design and variables measurement

To test our hypothesis, we run an OLS regression using pooled data of the following econometric model (Equation 1):

 $\begin{bmatrix} EQ(1) \end{bmatrix} \quad Fair \ Value_{it} = \beta_0 + \beta_1 Treated_{it} + \beta_2 Time_{it} + \beta_3 Treated_{it}^* Time_{it} + \beta_4 Securities_{it} + \beta_5 Efficiency_{it} + \beta_6 Transacct_{it} + \beta_7 CommLoan_{it} + \beta_8 MtgLoan_{it} + \beta_9 Chgoff_{it} + \beta_{10} Nonperform_{it} + \beta_{11} Sensitive_{it} + \beta_{12} Capratio_{it} + \beta_{13} ROA_{it} + \beta_{14} MarketCap_{it} + \beta_{15} Size_{it} + \beta_{16} MarketCap_{it} + \beta_{17} Tier I_{it} + \beta_{18} Big4_{it} + \beta_{18} AuditFees_{it} + \Sigma \ BankFixedEffects + \Sigma \ YearFixedEffects + \Sigma \ CountryFixedEffects + \varepsilon_{it}$

Following Ettredge et al. (2024), our dependent variable *Fair Value_{it}* is alternatively: the total fair value assets on total assets (*FVTA1*); the total fair value level 1 assets on total assets (*FVTA1*); the total fair value level 2 assets on total assets (*FVTA2*); the total fair value level 3 assets on total assets (*FVTA3*). We also analyze the total fair value liabilities on total liabilities (*FVTL*) and the relative proportion variables (*FVTL1*, *FVTL2*, *FVTL3*). *Treated* is a dummy identifying treated sample, given by the EU banks. As aforementioned, we use alternative control groups to ensure robust findings. *Time* is a dummy, 1 for years after the 2017 in the main analyses (covering the years 2015-2019), 0 otherwise. *Treated*Time* is used to test our hypothesis.

We use a battery of controls. Following Field et al., (2004) and Ettredge et al. (2014), we control for the bank's liquidity risk, operating risk, credit risk, capital risk and market risk. These risks should

influence the choice to use fair value measurements (Cannon and Bedard, 2017). To control for liquidity risk, we use TRANSACCT, measured as total transaction accounts deflated by total deposits; and SECURITIES, measured as 1 - (total securities on total assets). To control for operating risk, we use EFFICIENCY, measured as total operating expenses on total revenues. Four variables proxy for credit risk: COMMLOAN, measured as the sum of commercial and agricultural loans divided by gross loans; NONPERFORM, measured as nonperforming loans divided by gross loans; CHGOFF, measured as net charge-offs divided by loan loss reserve; MTGLOAN, measured as total domestic real estate and home equity loans divided by gross loans. To control for market risk, we use a SENSITIVE, measured as rate-sensitive assets minus rate-sensitive liabilities, divided by total assets. This is a measure of the extent to which the profitability of the bank and the value of its assets and liabilities are sensitive to changing market conditions (Field et al., 2004; Ettredge et al., 2014).

We also include further controls identified by prior studies as determinants of fair value use (Yao et al., 2018) or used in prior studies on bank auditing and accounting choices (Kanagaretnam et al., 2010; Beatty & Liao, 2014). We use the Tier 1 regulatory capital ratio, calculated as the bank's equity capital to total risk- weighted assets (TIER1). ROA is calculated as net income before extraordinary items and loan loss provisions divided by total assets at the beginning of the year (Kanagaretnam et al., 2010). SIZE is calculated as natural-log-transformed total assets. We also control for MARKETCAP, the natural log of market capitalization at the end of the year (Yao et al., 2018). Finally, we include two audit-related controls: Big4, a dummy dichotomous variable coded as 1 for firms audited by the Big 4 auditors (PwC, KPMG, Deloitte, and E&Y), 0 otherwise; AUDITFEES, calculated as natural log of the auditor fees (Ettredge et al., 2014)⁸.

The model includes fixed effects for bank, year, and country. Appendix 1 summarizes the variables used and their measurements. All continuous variables are winsorized at the 1 percent and 99 percent levels.

6. Empirical findings

6.1 Descriptive statistics

Table 1 Panel A shows the descriptive statistics for the FVMs used in our analyses across four samples: European Union (EU), Europe (excluding the EU), the USA, and a global sample. The variables represent the mean value of assets measured at fair value (FVTA) and liabilities measured at fair value (FVTL), as well as the distribution among the three fair value hierarchy levels: Level 1 (FVTA1 and FVTL1), Level 2 (FVTA2 and FVTL2), and Level 3 (FVTA3 and FVTL3).

⁸ We use the item 1801 in Worldscope, which includes either audit and other non-audit fees.

For the EU sample, FVTA averages 29.5% of total assets (median 18.7%, and standard deviation 0.271). Looking at fair value hierarchy, FVTA1 accounts for 13.6% on average, FVTA2 for 8.8%, and FVTA3 for 8.1%. FVTL averages 18.3% of total liabilities, with FVTL1 contributing 2.9%, FVTL2 9.3%, and FVTL3 15.2%. The median values for FVTL1 and FVTL3 are near zero, suggesting that only a small portion of EU banks rely significantly on these inputs.

For the European (non-EU) sample, FVTA accounts for an average of 25.1% of total assets (median of 14.9%, and standard deviation of 0.274). FV Level 2 assets represent the largest share (11% on average), followed by Level 1 (8.2%) and Level 3 (10.9%). Notably, the use of FV Level 3 assets is higher in non-EU European banks, likely due to fewer liquid markets, and limited availability of comparable transactions or market data (Bagna et al., 2014; Adwan, 2016). On the liabilities side, FV liabilities represent 16.5% of total liabilities on average, with significant variability (standard deviation of 0.337). Among FV liabilities, Level 3 contributes the most (mean 30.5%; median 2.7%).

The US sample shows the highest reliance on fair value measurements, averaging 34.0% of total assets (median of 15.0%, and standard deviation of 0.355). FV Level 1 assets are minimal at 2.0%, while Level 2 (16.8%) and Level 3 (15.5%) dominate asset fair value reporting. This aligns with McDonough et al. (2020), who observe limited use of FV Level 1 assets in U.S. banks and highlight Level 2 as the most common. The US sample also records the highest FVTL at 21.4% of total liabilities on average, though the median is 0, indicating a skewed distribution (SD of 0.400). FVTL2 contributes the most (11.5%), while FVTL1 (6.3%) and FVTL3 (4.8%) play smaller roles, again consistent with McDonough et al. (2020)'s findings.

The Global sample, comprising 5,157 observations across all regions, shows that FVTA averages 23.3% of total assets (median of 13.5%, and standard deviation of 0.268). This empirical evidence broadly aligns with, but slightly exceeds, the findings of Yao et al. (2016), who examine fair value assets globally, excluding U.S. banks. Among fair value inputs, FVTA1 averages 6.4%, FVTA2 12.9%, and FVTA3 9.1%. FVTL accounts for 14.9% of total liabilities on average, with FVTL1 contributing 2.3%, FVTL2 9.6%, and FVTL3 14.2%. The standard deviation for FVTL is 0.305, indicating variability comparable to regional samples.

Appendix 2 reports descriptive statistics on the use of FVM for assets in selected sample treated and control Countries, useful for an analysis of the parallel trend assumption. With different colours, we present the mean total fair value assets on total assets (FVTA); the mean total fair value level 1 assets on total assets (FVTA1); the mean total fair value level 2 assets on total assets (FVTA2); the mean total fair value level 3 assets on total assets (FVTA3). To provide a broader picture, we provide data on a longer time frame (2010-2022) than that used in our main analyses.

Visual evidence related to some treated Countries (France, Italy and Spain) shows an increasing trend in the use of FVMs until 2016 with a visible decrease from 2017 on (the decrease is partly anticipated from 2015 on for Spain). Visual evidence also shows that the decrease stabilizes from 2020 on. United Kingdom is the only treated Country to display an increasing use of FVMs over the period, due to potential confounding events (see above Section 2). For this reason, we run our analyses with and without this Country (see above Section 5). The descriptive statistics of selected control European non-EU Countries (Norway, Turkey and Liechtenstein) show an overall increasing trend in the FVMs, with an average use of FVMs higher from 2016 on than in early 2010s. Norway approved an audit reform similar to the EU Audit Reform in 2020 with implementation for January 1st 2021. Interestingly, visual evidence displays a decline in FVMs after that reform (PWC, 2023).

The descriptive statistic about the US shows a positive trend in the use of FVMs in the period 2010-2022. Selected control Countries from the global sample (China, Hong Kong, Singapore) display an increasing trend over the period. These data suggest that, unlike control Countries and the US, EU Countries reduce the use of FVMs after the implementation of the Reform, when the increasing pattern of use is interrupted.

Table 1 Panel B summarizes the descriptive statistics of control variables for the EU sample. Commercial loans (*Commloan*) are on average 20% of the gross loans, and Mortgage loans (Mgtloan) averages 14. The median of non-performing loans on gross loans (*Nonperform*) is 5% with an average 9%⁹. Operational efficiency (Efficiency) mean is 46%. Tier 1 capital averages 15.49%, reflecting regulatory compliance, and firm size shows limited variation. Overall, Big Four accounting firms dominate the banks' auditing market, with 76% of the banks in our sample audited.

6.2 Main Analyses

Table 2 panel A shows the results obtained by regressing Equations 1 using EU banks as treated sample and two alternative controls: in Panel A, the control group includes banks headquartered in European countries that are not in the EU, whereas in Panel B the control group consists of global banks headquartered in the rest of the world.

Table 2, column 1 of Panel A, shows that the dummy EU does not exhibit a statistically significant association with FVTA. The variable *POST* shows a positive and significant association with the dependent variable, suggesting a difference between the years prior to reform and post-

⁹ These data align with EBA data gathered during the consultation which led to establish a 5% NPL ration attention thresholds for banks in mid 2015 (see https://www.eba.europa.eu/eba-

response/8811#:~:text=This%20threshold%20is%20set%20at,Performing%20Loans%2FTotal%20Loans).)

reform years. The interaction between *EU* and *POST* shows a statistically significant negative association with total FV assets, with *p-value* <0.01 (Table 2, Panel A column 1). The asssets measured at fair value declines by an average 18% after the Reform in EU banks (compared to non-EU European banks). The other columns of Table 3, Panel A shows that the results related to the fair value level 1 assets (*FVTA*1), the fair value level 2 assets (*FVTA*2), and the fair value level 3 assets (*FVTA*3). The decline is limited to about 2.1% for FV Level 1, it grows to about 4,7% for FV Level 2. Most of the reduction in the use of FV is related to Level 3: -12,2%.

The findings provide empirical support for our HP1, suggesting that the prohibitions of non-audit valuation services significantly influence the use of FVMs by EU banks. The lesser use appears to be related to increased preparation costs, and heightened risks of mismeasurement. Most of the reduction is related to the costlier and riskier FV Level 3 assets.

Table 2 panel B replicates the main analyses of Table 2 panel A, using the global sample as control. Table 2, Panel B, shows that the interaction between EU and POST has a negative and statistically significant association with FVMs (p-value < 0.01). The findings suggest that EU banks reduced the FVMs use compared to global banks.

To further corroborate our findings, we estimate Equation 1 using as dependent variables the total fair value liabilities on total liabilities (*FVTL*) and the relative proportion by fair value level variables (*FVTL1, FVTL2, FVTL3*). Like the results obtained for the fair value assets, the findings reported in columns 1, 2 and 3 of Table 3 show that EU has no association with fair value amounts, except for the fair value level 1 (*FVTL1*). The interaction between EU and POST has a negative significant correlation with total fair value liabilities (FVTL) with p-value <0.05, indicating a reduced use after the Reform. The results about the fair value levels yield weakly significant negative correlations (with FVTL3 near the significance but not significant).

Table 4 displays the results obtained using US banks as "control" sample. US banks are not allowed to use non-audit valuation services since 2004, i.e. they were treated 10 years before the EU banks, making them interesting for a comparison. The results provide evidence of an overall decrease in total FVMs use in EU banks compared with US banks, much lower than in the main analyses. Also, the difference is not significant with regarded to FV level 2 and weakly significant for FV Level 3. The difference is significant (p-value 0.01) only for FV level 1: about -3%. The analysis on this additional benchmark may provide indirect evidence on the effect of the Reform on the EU banks. They may also suggest that US banks provide a benchmark for the long-term effect of non-audit valuation services prohibition. Over time, banks may through improvement of accounting internal processes, amassing knowledge, and expertise over time, hiring experts (Bell et al., 2015). A maturity and learning effect over time can prompt banks to increase the use of FVMs

again. This can be confirmed by the descriptive of US banks, similar to non-treated Countries, as well as by the descriptive statistics of some EU Country suggesting the use of FVMs stabilize after the decrease.

6.3 Further investigations

Further investigations aim to examine potential anticipatory behavior during the period from 2012 to 2016, with 2014 as treatment year. While some degree of anticipatory behavior may be feasible, we consider it unlikely that a fully proactive adjustment occurred within this timeframe. This is due to the limited period available, and the complexity involved in transitioning from auditor-provided valuation services to alternative specialists, either hired or external consultants. Untabulated results provides no evidence of anticipatory behavior by EU banks.

We also undertake a cross-sectional analysis of EU banks audited by Big4 versus EU banks audited by non-Big4. Table 5, Panel A, provides descriptive statistics for EU banks FV assets prereform and post reform, with data split by auditor's type. The data shows that FVMs decreased after the reform, with the decrease more pronounced for banks audited by non-Big4 auditors. Notably, FV Level 3 decreased by 2% (from 8.8% pre-reform to 6.8% post reform). For Big4 auditors, the decrease in the use of FV Level 3 is about -0.9%, while the use of such measurement is halved in EU banks audited by non-Big4 (from 11.2% to 5.3%).

Table 5, Panel B, reports the results obtained estimating a triple difference-in-differences analysis. Our variable of interest is the interaction term EU*POST*Big4, obtained by interacting our EU*POST with a dummy variable that has value 1 if the bank is audited by a non-Big4, 0 otherwise The findings shows that EU banks audited by non-Big4 auditors significantly reduces their FV Level 3 assets compared to those audited by Big4 auditors. EU banks audited by non-Big4 appear to be more cautious in using FV Level 3 and reduce their reliance on such valuations. Such banks likely benefited from less knowledge spillover before the Reform and aims at avoiding regulatory scrutiny on subjective measurements in the post-reform environment.

Another investigation focuses on high NPL banks. We search for differences among EU banks pre-post reform distinguishing between High NPL and non-High NPL banks. High NPL banks are those with NPL ratio above 5% (EBA NPL Guidelines), which is the attention threshold triggering management's action to reduce the NPL according to the EBA. The topic was being discussed at the time of the Audit Reform implementation.

Table 8 displays the results of the analysis. Table 6 Column 1 shows that High NPL banks display a greater use of FVMs (see the coefficient of High NPL +10,7% significant at the 1% level).

Table 6 column 4 show that after the Reform, High NPL banks reduce the FV level 3 diminishing the difference from about +7% before the Reform to +1% after (given by +7% -6% approximately). At the same time, they slightly increase the FV Level 1 by about 1,5% (Table 8, column 1). The reduced use of more discretional FVMs Level 3 aligns with the potentially higher scrutiny by more independent auditors, as well as with regulatory pressure. Since fair value Level 3 valuations can allow for a degree of discretion in valuing assets, these banks might limit their use to avoid any perception of aggressive or overly optimistic accounting practices, especially when combined with high NPL levels.

6.4 Robustness tests

We undertake a battery of robustness tests (untabulated). We re-run our analyses using a classic DID model without bank and year fixed effects, as well as excluding any fixed effects including country. We also re-run our analyses excluding the dummies for the treatment and the control, keeping the bank, year, and country fixed effects. We obtain consistent results.

7. Conclusions

This paper has investigated the impact of prohibition of non-audit valuation services (NAS) on the use of fair value measurements (FVMs) in the banking industry. It uses the European Union Audit Reform implementation across EU Member States. The findings provide evidence that EU banks significantly reduced their reliance on FVMs, particularly for more complex and subjective fair value levels (levels 2 and mostly 3), following the implementation of the reform. This reduction suggests that the prohibition of non-audit valuation services raised the costs and the risks associated with preparing and auditing these measurements. Consequently, EU banks, especially those audited by non-Big4 firms, reduced their use of FVMs to avoid higher audit and preparation costs, and to mitigate the risk of errors or mismeasurements. These findings suggest that the EU Audit Reform had an unintended consequence of deterring banks from using FVMs, particularly the more complex valuations, in contrast to the potential market confidence boost envisioned by regulators and practitioners advocating the use of fair value in accounting.

The larger reduction in FVMs by non-Big4 audited banks suggests that these banks may have relied more on the knowledge provided by NAS, and the absence of such services under the reform has impacted them more significantly. Further analyses also show that banks with more NPLs reduced more their use of FVMs, especially FVMs level 3.

This paper seeks to contribute to the existing literature on the impact of audit reforms. Previous studies have shown that such reforms can enhance stock market liquidity (Ernstberger et al., 2012) or improve debt financing conditions (Lisowsky et al., 2017; Balakrishnan et al., 2021). Our research demonstrates that audit reforms can also affect how banks use fair value measurements (FVMs). Additionally, this study extends prior auditing literature in the banking sector by providing evidence on the influence of a particular non-audit service (valuation services) on banks' accounting practices, addressing calls for more research on this issue (Gaver & Paterson, 2014; Lobo, 2017). Lastly, it offers insights into the relationship between audits and fair value accounting, highlighting that the prohibition of non-audit valuation services may hinder the knowledge transfer that supports the use of FVMs within the banking industry (McDonough et al., 2020).

This study also has policy implications of this study. As regulators continue to review the EU Audit Reform, these findings offer insights into the consequences of prohibiting NAS on the financial reporting practices of banks. Given that the reform aimed to enhance auditor independence, the unintended effect of reducing the use of FVMs, especially those at more complex levels, should be considered in ongoing policy evaluations. Regulators may need to balance the goal of maintaining audit independence with the practical challenges banks face in preparing fair value estimates without NAS support.

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Table 1 – Descriptive statistics

95th perc EU Mean Median SD 5th perc Ν FVTA 0.295 0.187 0.271 0.037 0.959 1,180 FVTA1 0.136 0.113 0.006 0.112 0.354 1,180 FVTA2 0.037 0.000 0.088 0.133 0.320 1,180 FVTA3 0.081 0.006 0.208 0.000 0.684 1,180 FVTL 0.183 0.031 0.311 0.000 0.987 1,180 FVTL1 0.029 0.005 0.069 0.000 0.116 1,180 FVTL2 0.093 0.018 0.194 0.000 0.382 1,180 FVTL3 0.152 0.003 0.327 0.000 0.966 1,180 Median SD 5th perc 95th perc Europe Mean Ν FVTA 0.251 0.149 0.274 0.032 0.988 676 FVTA1 0.091 0.000 0.082 0.062 0.258 676 FVTA2 0.110 0.054 0.159 0.002 0.535 676 FVTA3 0.109 0.021 0.219 0.000 0.753 676 FVTL 0.994 0.165 0.011 0.337 0.000 676 FVTL1 0.023 0.002 0.056 0.000 0.151 676 FVTL2 0.088 0.008 0.224 0.000 0.818 676 FVTL3 0.305 0.027 0.391 0.000 0.994 676 USA Mean Median SD 5th perc 95th perc Ν FVTA 0.340 0.150 0.355 0.030 0.978 436 FVTA1 0.020 0.000 0.043 0.000 0.119 436 FVTA2 0.168 0.114 0.180 0.024 0.448 436 FVTA3 0.155 0.000 0.307 0.000 0.831 436 FVTL 0.214 0.000 0.400 0.000 0.994 436 FVTL1 0.063 0.000 0.197 0.000 0.781 436 FVTL2 0.115 0.000 0.294 0.000 0.985 436 FVTL3 0.048 0.000 0.540 0.000 0.191 436

Panel A – Fair value measurements (period 2015-2019)

Global	Mean	Median	SD	5 th perc	95 th perc	Ν
FVTA	0.233	0.135	0.268	0.005	0.900	5,157
FVTA1	0.064	0.039	0.074	0.000	0.201	5,157
FVTA2	0.129	0.065	0.182	0.000	0.576	5,157
FVTA3	0.091	0.005	0.212	0.000	0.656	5,157
FVTL	0.149	0.012	0.305	0.000	0.981	5,157
FVTL1	0.023	0.003	0.066	0.000	0.089	5,157
FVTL2	0.096	0.006	0.241	0.000	0.928	5,157
FVTL2	0.142	0.003	0.299	0.000	0.960	5,157

Panel B – Descriptive statistics control variables EU Countries

	Mean	Median	SD	5 th perc	95 th perc	Ν
Securities	0.98	1.00	0.04	0.90	1.00	1,180
Transacct	0.31	0.36	0.25	0.10	0.81	1,180
Efficiency	0.46	0.42	0.25	0.28	0.74	1,180
Commloan	0.20	0.12	0.25	0.00	0.67	1,180
Nonperform	0.09	0.05	0.10	0.01	0.29	1,180
Chgoff	0.10	0.06	0.18	-0.08	0.41	1,180
Mgtloan	0.14	0.00	0.23	0.00	0.60	1,180
Sensitive	-0.15	-0.14	0.15	-0.46	0.30	1,180
ROA	0.01	0.01	0.01	-0.00	0.02	1,180
Tier1	15.49	15.00	3.25	11.34	21.35	1,180
Size	16.82	16.79	2.37	12.94	21.16	1,180
Marketcap	14.03	14.51	2.26	10.37	17.39	1,180
Big4	0.76	1.00	0.42	0.00	1.00	1,180
Auditfees	14.63	14.44	1.85	12.02	17.74	1,180

Table 2 Main analyses: assets

This Table presents the results of regressing the main model using European Union Banks as treated sample and two alternative controls: European Non-EU banks in Panel A, and global banks in Panel B Variables definition is in Appendix 2. In each panel, Column 1 displays the result related to total fair value assets on total assets. Column 2, 3 and 4 the results related to specific fair value levels. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

	Column 1	Column 2	Column 3	Column 4
Variables	FVTA	FVTA1	FVTA2	FVTA3
EU	0.286	-0.300***	0.0820	0.280
	(0.229)	(0.0614)	(0.118)	(0.184)
POST	0.145***	0.00456	0.0338*	0.114***
	(0.0396)	(0.00954)	(0.0201)	(0.0317)
EU*POST	-0.181***	-0.0266***	-0.0471***	-0.122***
	(0.0343)	(0.00838)	(0.0174)	(0.0279)
Securities	-0.489	-0.309***	-0.273	0.00520
	(0.415)	(0.0951)	(0.230)	(0.328)
Efficiency	-0.0154	-0.0230*	0.00910	-0.00821
	(0.0527)	(0.0121)	(0.0269)	(0.0416)
Transact	0.142	0.168***	-0.0369	-0.00970
	(0.146)	(0.0336)	(0.0754)	(0.115)
Commloan	-0.0579	0.0122	0.0413	-0.0989
	(0.129)	(0.0310)	(0.0831)	(0.130)
Mtgloan	0.470*	-0.212***	0.0250	0.646***
	(0.279)	(0.0698)	(0.146)	(0.224)
Chgoff	-0.0267	-0.0225	0.00478	-0.0203
	(0.0557)	(0.0143)	(0.0285)	(0.0448)
Nonpermloan	-0.495	0.0545	0.247	-0.845***
	(0.353)	(0.0815)	(0.178)	(0.283)
Sensitive	-0.259	-0.144***	-0.157	-0.0339
	(0.178)	(0.0411)	(0.0978)	(0.143)
ROA	3.566*	0.0873	3.234***	0.0483
	(2.061)	(0.474)	(1.045)	(1.642)
CapRatio	-0.0194*	-0.00156	-0.00248	-0.0165*
	(0.0110)	(0.00258)	(0.00556)	(0.00888)

Panel A – European Union Banks versus European Non-EU banks

MarketCap	0.368***	0.537***	0.104*	0.244***
	(0.104)	(0.0473)	(0.0543)	(0.0846)
Size	-0.141*	-0.0562***	-0.0754*	-0.0370
	(0.0806)	(0.0186)	(0.0423)	(0.0653)
Tier1	0.0156	0.00589**	0.00309	0.0107
	(0.0123)	(0.00286)	(0.00624)	(0.00993)
AuditFees	0.00734	-0.00322	0.00220	0.0117
	(0.0166)	(0.00381)	(0.00866)	(0.0133)
Big4	1.021***	0.519***	0.253**	0.736***
	(0.231)	(0.0725)	(0.119)	(0.185)
Constant	-3.755**	-7.160***	-0.317	-4.006***
	(1.583)	(0.707)	(0.835)	(1.273)
Observations	1856	1856	1856	1856
R-squared	0.806	0.933	0.863	0.750
Year FE	YES	YES	YES	YES
Country FE	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES

Panel B – European Union Banks versus Global banks

	Column 1	Column 2	Column 3	Column 4
VARIABLES	FVTA	FVTA1	FVTA2	FVTA3
EU	1.966***	0.500***	0.334	0.843***
	(0.424)	(0.128)	(0.372)	(0.210)
POST	0.0281	0.0161***	-0.00620	0.0221
	(0.0175)	(0.00532)	(0.0109)	(0.0146)
EU*POST	-0.0791***	-0.0327***	-0.0252**	-0.0245**
	(0.0171)	(0.00518)	(0.0106)	(0.0120)
Securities	-0.390**	-0.279***	-0.0983	0.140
	(0.179)	(0.0555)	(0.114)	(0.129)
Efficiency	-0.0132	-0.0208**	0.0146	4.61e-05
-	(0.0368)	(0.0106)	(0.0224)	(0.0232)
Transact	0.0617	0.145***	0.00714	0.0237
	(0.0650)	(0.0223)	(0.0396)	(0.0454)
Commloan	0.0348	-0.0235	-0.0381	0.0109
	(0.0742)	(0.0222)	(0.0479)	(0.0551)
Mtgloan	-0.0109	-0.00533	-0.0753	0.0222
-	(0.0980)	(0.0334)	(0.0713)	(0.0684)
Chgoff	-0.0244	-0.0199**	-0.0177	-0.0383**
-	(0.0276)	(0.00990)	(0.0168)	(0.0191)
Nonpermloan	-0.401**	0.0429	0.210*	-0.516***
-	(0.202)	(0.0596)	(0.127)	(0.120)
Sensitive	-0.127	-0.123***	-0.0701	0.0531
	(0.0931)	(0.0301)	(0.0599)	(0.0582)
ROA	3.379***	0.640*	3.456***	-0.812
	(1.137)	(0.338)	(0.738)	(0.759)
CapRatio	-0.00674	-0.000984	-0.00638*	0.00129
	(0.00563)	(0.00182)	(0.00345)	(0.00368)
MarketCap	0.159*	0.0588**	-0.0172	0.0481

	(0.0962)	(0.0277)	(0.0584)	(0.0597)
Size	-0.134***	-0.0187	0.0167	-0.0533**
	(0.0433)	(0.0131)	(0.0281)	(0.0271)
Tier1	0.00606	-0.000786	0.00795**	-0.00244
	(0.00573)	(0.00187)	(0.00360)	(0.00377)
AuditFees	0.00655	0.000737	0.00150	-0.000578
	(0.0105)	(0.00318)	(0.00655)	(0.00509)
Big4	1.107***	0.0564	0.141*	0.892***
	(0.123)	(0.0362)	(0.0754)	(0.0759)
Constant	-0.921	-0.0952	-0.0488	-0.796
	(1.289)	(0.371)	(0.819)	(1.063)
Observations	6337	6337	6337	6337
R-squared	0.872	0.934	0.886	0.902
Year FE	YES	YES	YES	YES
Country FE	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES

Table 3 Main analyses: liabilities

This Table presents the results of regressing the main model using European Union Banks as treated sample European Non-EU banks as control. Variables definition is in Appendix 2. In each panel, Column 1 displays the result related to total fair value liabilities on total liabilities. Column 2, 3 and 4 the results related to specific fair value levels. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

	Column 1	Column 2	Column 3	Column 4
VARIABLES	FVTL	FVTL1	FVTL2	FVTL3
EU	0.152	0.150***	0.0414	0.152
	(0.235)	(0.0515)	(0.175)	(0.209)
POST	0.0761*	0.00400	0.0631**	0.0224
	(0.0413)	(0.00672)	(0.0309)	(0.0414)
EU*POST	-0.0843**	-0.0112*	-0.0451*	-0.0243
	(0.0362)	(0.00632)	(0.0271)	(0.0363)
Securities	-0.431	-0.0560	-0.301	-0.383
	(0.461)	(0.0787)	(0.345)	(0.382)
Efficiency	0.0102	-0.00537	0.0203	-0.0618
	(0.0534)	(0.00757)	(0.0398)	(0.0631)
Transact	-0.133	-0.00972	-0.0137	-0.132
	(0.148)	(0.0250)	(0.112)	(0.117)
Commloan	-0.0193	-0.153***	0.0461	0.284
	(0.165)	(0.0418)	(0.123)	(0.247)
Mtgloan	0.0271	0.118	-0.200	0.473
	(0.284)	(0.0753)	(0.218)	(0.337)
Chgoff	-0.0364	0.00798	-0.00909	-0.0274
	(0.0617)	(0.0130)	(0.0467)	(0.0618)
Nonpermloan	-0.810**	-0.130**	-0.533**	0.178
	(0.355)	(0.0566)	(0.265)	(0.328)
Sensitive	-0.137	-0.00692	-0.147	-0.248
	(0.189)	(0.0349)	(0.149)	(0.189)
ROA	4.723**	0.393	3.629**	-0.574
	(2.081)	(0.381)	(1.552)	(2.012)

CapRatio	-0.00457	-0.00110	-0.00241	0.0155
	(0.0114)	(0.00169)	(0.00851)	(0.00988)
MarketCap	0.540***	-0.133*	0.590***	-0.0351
-	(0.107)	(0.0745)	(0.0805)	(0.0881)
Size	-0.268***	0.0273*	-0.240***	-0.121
	(0.0847)	(0.0143)	(0.0635)	(0.0936)
Tier1	0.00410	0.000806	-0.000510	-0.0129
	(0.0125)	(0.00188)	(0.00940)	(0.0120)
AuditFees	0.00587	9.02e-05	-0.00417	-0.0328
	(0.0173)	(0.00210)	(0.0130)	(0.0286)
Big4	1.447***	0.0293	1.598***	0.413**
	(0.235)	(0.0498)	(0.177)	(0.193)
Constant	-4.427***	1.500	-5.791***	2.947***
	(1.658)	(1.060)	(1.237)	(0.708)
Observations	498	277	497	234
R-squared	0.848	0.977	0.842	0.947
Year FE	YES	YES	YES	YES
Country FE	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES

\mathbf{x}	T٤	ıble	- 4 -	Further	investigations:	comparison	with	US	banks
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This Table presents the results of regressing the main model using European Union Banks as treated sample US banks as control. Variables' definition is in Appendix 2. Column 1 displays the result related to total fair value assets on total assets. Column 2, 3 and 4 the results related to specific fair value levels. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

	Column 1	Column 2	Column 3	Column 4
Variables	FVTA	FVTA1	FVTA2	FVTA3
EU	0.183	0.0149	0.00650	0.254
	(0.416)	(0.115)	(0.242)	(0.297)
POST	0.0160	-0.00372	-0.0109	0.0337
	(0.0415)	(0.0114)	(0.0241)	(0.0299)
EU*POST	-0.0805**	-0.0299***	-0.0109	-0.0464*
	(0.0360)	(0.00989)	(0.0211)	(0.0259)
Securities	-0.369	-0.278***	-0.135	-0.0213
	(0.302)	(0.0830)	(0.192)	(0.216)
Efficiency	-0.00610	-0.0220**	0.0186	-0.00497
-	(0.0382)	(0.0105)	(0.0224)	(0.0273)
Transact	0.109	0.196***	-0.0467	-0.0537
	(0.107)	(0.0295)	(0.0634)	(0.0767)
Commloan	-0.134	0.0262	-0.0824	-0.127
	(0.190)	(0.0526)	(0.112)	(0.136)
Mtgloan	0.0587	-0.0253	-0.137	0.0997
	(0.247)	(0.0730)	(0.148)	(0.176)
Chgoff	-0.127***	-0.0182	-0.0514*	-0.0644*
	(0.0476)	(0.0131)	(0.0280)	(0.0342)
Nonpermloan	-0.561**	0.0243	0.297*	-0.871***
	(0.264)	(0.0733)	(0.153)	(0.190)
Sensitive	-0.268*	-0.176***	-0.124	-0.0426
	(0.138)	(0.0380)	(0.0882)	(0.0996)
ROA	3.668**	0.430	4.015***	-0.397
	(1.445)	(0.397)	(0.838)	(1.039)
CapRatio	-0.00553	-0.00206	0.00562	-0.00244
	(0.00839)	(0.00231)	(0.00486)	(0.00601)
MarketCap	0.248	0.0780	-0.107	0.189

	(0.301)	(0.0849)	(0.175)	(0.215)
Size	-0.155***	-0.0178	-0.0332	-0.116***
	(0.0547)	(0.0151)	(0.0324)	(0.0397)
Tier1	0.00512	0.00606**	-0.00730	-0.000339
	(0.00925)	(0.00254)	(0.00538)	(0.00667)
AuditFees	0.00468	-0.00227	0.000972	0.00831
	(0.0122)	(0.00337)	(0.00735)	(0.00879)
Big4	0.234**	-0.0345	0.157***	0.112*
	(0.0932)	(0.0256)	(0.0542)	(0.0667)
Constant	-0.892	-0.613	2.251	-1.043
	(4.383)	(1.241)	(2.543)	(3.130)
Observations	1616	1616	1616	1616
R-squared	0.898	0.953	0.891	0.904
Year FE	YES	YES	YES	YES
Country FE	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES

Table 5 - Further investigations: Big4 versus non-Big4

	FVTA	FVTA1	FVTA2	FVTA3
Total Pre-Reform average	0.335	0.146	0.095	0.088
Total Post-Reform average	0.269	0.129	0.079	0.068
Big4 Pre-Reform average	0.352	0.152	0.106	0.083
Big4 Post-Reform average	0.287	0.131	0.088	0.072
Non-Big4 Pre-Reform average	0.276	0.126	0.054	0.112
Non-Big4 Post-Reform	0.211	0.120	0.049	0.053
average				

Panel A – Descriptive for EU banks Pre-Post per type of auditor (period 2015-2019)

Panel B – Regression Analysis

This Table presents a triple DDD analysis seeking differences between the behaviour of EU banks audited by Big4 versus EU banks audited by non-Big4 after the Audit Reform. Non-Big4 is a dummy variable, 1 if the bank is audited by a Non-Big4, 0 otherwise. The control is the European Non-EU firms. The other variables are defined in Appendix 2. In each panel, Column 1 displays the result related to total fair value asses on total assess. Column 2, 3 and 4 the results related to specific fair value levels. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

VARIABLES	Column 1 FVTA	Column 2 FVTA1	Column 3 FVTA2	Column 4 FVTA3
EU	0.800*	0.0784	0.254	0.0424
	(0.445)	(0.0919)	(0.179)	(0.501)
time2	0.0754**	-0.0111	0.0319**	0.0789***
	(0.0325)	(0.00796)	(0.0159)	(0.0280)

DIDEU2	-0.0871***	-0.0228***	-0.0312**	-0.0621**
	(0.0283)	(0.00698)	(0.0138)	(0.0248)
NonBig4	-0.424	0.0607	0.0809	0.118
	(1.000)	(0.0397)	(0.347)	(0.178)
tripleDDDNonBig4	-0.0788*	0.00806	-0.0177	-0.0700**
	(0.0425)	(0.0100)	(0.0212)	(0.0343)
Observations	1856	1856	1856	1856
R-squared	0.761	0.919	0.825	0.711
Controls	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Country FE	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES

Table 6 - Further investigations: High NPL banks

This Table presents a cross-section among EU banks classified in two groups: High NPL and non-High NPL banks, where high NPL banks are those with NPL ratio above 5% (EBA NPL Guidelines). The analysis is only on EU banks. The other variables are defined in Appendix 2. In each panel, Column 1 displays the result related to total fair value asses on total assess. Column 2, 3 and 4 the results related to specific fair value levels. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

	Column 1	Column 2	Column 3	Column 4
VARIABLES	FVTA	FVTA1	FVTA2	FVTA3
HighNPL	0.107***	0.0108	0.0263*	0.0699**
	(0.0332)	(0.00818)	(0.0143)	(0.0281)
POST	-0.0108	-0.0362***	-0.0172	0.0471*
	(0.0310)	(0.00756)	(0.0135)	(0.0260)
HighNPL*POST	-0.0631**	0.0147**	-0.0161	-0.0596**
	(0.0291)	(0.00709)	(0.0127)	(0.0245)
Observations	1190	1100	1100	1100
	1160	1160	1160	1160
R-squared	0.851	0.949	0.913	0.809
Controls	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Country FE	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES

Appendix 1

This appendix summarizes the variables used and their measurement.

Name	Measurement	Source
FVTA	total fair value assets on total assets at time t	Bankfocus
FVTA1	total fair value level 1 assets on total assets at time t	Bankfocus
FVTA2	total fair value level 2 assets on total assets at time t	Bankfocus
FVTA3	total fair value level 3 assets on total assets at time <i>t</i>	Bankfocus
FVTL	total fair value liabilities on total liabilities at time t	Bankfocus
FVTL1	total fair value level 1 liabilities on total liabilities at time t	Bankfocus
FVTL2	total fair value level 2 liabilities on total liabilities at time t	Bankfocus
FVTL3	total fair value level 3 liabilities on total liabilities at time t	Bankfocus
TRANSACCT	total transaction accounts deflated by total deposits at time t	Bankfocus
SECURITIES	1 - (total securities on total assets) at time <i>t</i>	Bankfocus
EFFICIENCY	total operating expenses on total revenues at time t	Bankfocus
COMMLOAN	sum of commercial and agricultural loans divided by gross loans	Bankfocus
	at time t	
NONPERFORM	nonperforming loans divided by gross loans at time t	Bankfocus
CHGOFF	net charge-offs divided by loan loss reserve at time t	Bankfocus
MTGLOAN	total domestic real estate and home equity loans divided by gross	Bankfocus
	loans at time t	
SENSITIVE	rate-sensitive assets minus rate-sensitive liabilities, divided by	Bankfocus
	total assets at time t	
TIER1	Tier 1 regulatory capital ratio, calculated as the bank's equity	Bankfocus
	capital to total risk- weighted assets at time t	

ROA	net income before extraordinary items and loan loss provisions	Bankfocus
	at time t , divided by total assets at $t-1$ (Kanagaretnam et al.,	
	2010).	
SIZE	natural-log-transformed total assets at time t	Bankfocus
MARKETCAP	natural log of market capitalization at time t	Bankfocus
BIG4	dummy dichotomous variable coded as 1 for firms audited by the	Worldscope
	Big 4 auditors (PwC, KPMG, Deloitte, and E&Y), 0 otherwise	
AUDITFEES	natural log of the auditor fees (Ettredge et al., 2014)	Worldscope

Appendix 2

This appendix includes descriptive statistics on the use of FVM for assets in selected sample treated and control Countries. With different colors, we present the mean total fair value assets on total assets (FVTA); the mean total fair value level 1 assets on total assets (FVTA1); the mean total fair value level 2 assets on total assets (FVTA2); the mean total fair value level 3 assets on total assets (FVTA3). To provide a broader picture, we provide data on a longer time frame than that used in our main analyses.



Selected Treated Countries









Selected Control European Non-EU Countries





US sample



Selected control global sample





