



## CROSS-COUNTRY EVIDENCE ON JOINT INDUSTRY SPECIALIZATION AND AUDIT QUALITY: A COMPARATIVE STUDY OF THE UK AND EU CAPITAL MARKETS POST-FINANCIAL CRISIS

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### ABSTRACT

This study investigates the impact of joint industry specialization by audit firms on audit quality across two major capital markets, the United Kingdom and selected European Union (EU) countries, during the post-financial crisis period from 2012 to 2020. We assess whether the synergistic expertise at both national and local office levels enhances audit quality more effectively than specialization at a single level. We approximate audit quality using three well-established measures available in a panel data set of listed firms: the value of the discretionary accruals, the error in accrual estimation, and audit opinion modification. The specification of our comparative analysis indicates that joint specialists have always been superior to non-specialist and one-level specialist specialists in either suppressing earnings manipulation or pursuing auditor conservatism. It is worth noting that although audit offices in the UK present a more harmonized system of national knowledge sharing, EU audit firms are more inconsistent due to differences in regulation and institutions. These results add credible cross-country data to the benefits of joint industry specialization in terms of the quality of audit and show the implications of joint industry specialization to regulators, investors, and strategy within audit firms in an ever-more harmonized financial market.

**KEYWORDS:** Joint industry specialization, audit quality, discretionary accruals, modified audit opinion, UK, EU, big four auditors, post-crises regulation

### I. INTRODUCTION

The 2007-2008 global financial crisis exposed serious weaknesses in corporate governance, financial reporting, and the external audit process. Subsequently, the quality of external audits was reemphasized, especially in large capital markets like the United Kingdom and the European Union. One crucial factor associated with audit quality is auditor industry specialization, especially when such specialization is present at both the national (firm-wide) and city (office-specific) levels—known as joint industry specialization.

Prior literature suggests that audit firms with industry expertise are better equipped to understand complex industry-specific transactions, apply tailored audit procedures, and identify irregularities or earnings manipulation (DeFond & Zhang, 2014; Habib, 2011). While national-level specialization indicates standardized training, audit methodologies, and firm-wide resource deployment, city-level specialization reflects hands-on experience with local clients and markets, thereby reinforcing auditor familiarity and judgment (Ferguson et al., 2003; Francis et al., 1999).

In the UK, previous studies have demonstrated that joint national and city-level specialists among the Big 4 audit firms are associated with enhanced audit quality—evidenced by lower discretionary accruals, greater auditor conservatism, and higher audit fees (Mohd-Kharuddin & Basioudis, 2018). However, there is limited comparative cross-country evidence that investigates whether this relationship holds consistently across other major EU capital markets, particularly in the post-financial crisis regulatory environment marked by the introduction of the EU Audit Regulation (2014) and increased scrutiny on auditor independence and market concentration.

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This research addresses a research gap by examining the impact of joint industry specialization on audit quality in the UK and other EU capital markets between 2012 and 2020. With the comparative approach, we assess whether the merits of joint specialization, including an improvement in accrual quality and the increased chances of issuing modified audit opinion, are universal or context-specific, affected by the audit market structure, enforcement of regulations and the principle of investor protection.

Audit quality is operationalized with the assistance of three auditing proxies that are well-established:

Size of the discretionary accruals, i.e., the earnings management;

Accrual estimation error- It refers to how accurately the accrual forecasts were made;

Auditor independence and conservatism as the direct indicator of modified audit opinions.

We have publicly traded firms listed on the London Stock Exchange and other stock markets in Germany, France, and the Netherlands. Our panel regression framework tests the hypothesis of whether there exists a positive association between joint industry specialization and audit quality after controlling for the effects of firm-level characteristics, corporate governance, and audit market dynamics.

The findings of this research will seek to add to the existing body of literature by the following means:

By broadening the joint specialization auditing quality framework to a multi-jurisdictional scenario, as opposed to a country-level scenario;

Looking at the impact of post-crisis regulation on the behavior of audit firms and specialization trends;

The work consists of practical implications for regulators, investors, and audit firms about the strategic value of developing national and city-level expertise.

## **II. LITERATURE REVIEW**

The Auditor industry specialization means that auditors are well acquainted with a particular industry and considered to boost the effectiveness of audits and improve the quality of audits. Specialists are better positioned to understand complex industry transactions, tailor audit procedures, and detect misstatements (DeFond & Zhang, 2014; Habib, 2011). Industry specialist auditors are typically associated with lower levels of discretionary accruals (Balsam et al., 2003; Krishnan, 2003), higher earnings conservatism (Lim & Tan, 2009), and more accurate financial reporting (Reichelt & Wang, 2010).

The specialization literature has evolved from measuring auditor expertise at the national level (firm-wide reputation and client base) to the city level (local office-specific experience). Ferguson et al. (2003) introduced the joint national-city specialization framework, highlighting the synergistic effect of combining centralized firm resources with localized industry experience. This practice has become topical, especially in the decentralized audit firm structure where the offices work with a certain independence.

### **II.I. SPECIALIZATION AT THE NATIONAL AND CITY LEVEL**

The reason for the difference between national and city-level specialization lies in the source and transfer of knowledge. National-level specialization assumes uniform training and centralized quality control across all offices (Francis et al., 1999), suggesting homogeneity in audit practices. In contrast, city-level specialization reflects localized learning, where audit offices develop industry expertise through repeated engagements within specific geographic areas (Wallman, 1996).

There is evidence, based on several studies, that have been supportive of city-level effects. For instance, Carson and Fargher (2007) find that city-level specialists earn higher fee premiums than national specialists. Sun and Liu (2013) report that city-level specialization is more effective in constraining accruals manipulation. The findings, however, are relative and vary by country due to issues related to audit market structure and other factors, such as the regulatory environment.

### **II.II. INDUSTRY SPECIALIZATION JOINTLY**

The joint national-city specialization framework posits that combining centralized knowledge (national level) with local engagement experience (city-level) leads to superior audit outcomes. Reichelt and Wang (2010) find that in the U.S., joint specialists are more likely to issue going-concern opinions and reduce earnings management. Minutti-Meza (2013) further confirms that joint specialists produce higher audit quality than their single-level counterparts.

In the UK context, Mohd-Kharuddin and Basioudis (2018) and Kharuddin et al. (2019) provide evidence that audit fee premiums are significantly higher for joint specialists, implying perceived higher quality by the market. Nonetheless, the research draws mainly on the pricing evidence, and there is still a lack of a direct connection between joint specialization and the outcomes of audit quality, such as accruals and audit opinions, in particular, in a cross-country context.

### **II.III. DIFFERENCES IN AUDIT QUALITY ACROSS COUNTRIES**

Quality audit does not only depend on the expertise of the auditor but also depends on institutional and regulatory elements. Francis (2004) argues that country-specific elements such as legal systems, enforcement intensity, and investor protection influence how audit quality is perceived and delivered. EU countries, although governed by a standard audit directive, differ in enforcement rigor, audit firm market structures, and financial reporting cultures (Francis & Wang, 2008).

Studies by Choi et al. (2008) and Knechel et al. (2013) indicate that cross-country differences impact audit outcomes even among Big 4 firms. To take a case, the degree of conservatism shown by auditors may be lower in countries where the protection of investors is weak, and the influence of specialization may be diluted. This acts as a testimony that comparative studies are necessary to validate the universality of audit quality drivers like joint specialization.

### **II.IV. POST-FINANCIAL CRISIS AND REGULATORY DEVELOPMENTS**

Issues related to the quality of audit: The financial crisis of 2008 has led both the UK and the EU to seek drastic changes in regulation, aiming to enhance audit quality. The EU Audit Regulation and Directive (2014) introduced mandatory audit rotation, prohibited certain non-audit services, and aimed to reduce market concentration. Similarly, the UK's Financial Reporting Council (FRC) emphasized audit transparency and auditor independence.

It is anticipated that all these post-crisis reforms should have an impact on both the structure and behavior of audit firms, which might shift the effectiveness and incentive of collective specialization development. Nevertheless, the empirical evidence of the effects of these regulatory changes on the quality of audit practices across Jurisdictions, particularly regarding joint industry specialization, remains limited.

## **II.V. HYPOTHESES DEVELOPMENT**

Specialization in the auditing industry has generally been linked to the better quality of audit, and this has mainly been attributed to the fact that the auditor/specialist has better knowledge of the industry he is auditing, has superior audit planning and thus has a better chance of discovering financial misstatement. When industry specialization is achieved at both the national and city (local office) levels, prior research (e.g., Ferguson et al., 2003; Reichelt & Wang, 2010) suggests an even more pronounced effect due to synergistic learning and resource integration. In this paper, the author will analyze the uniformity of the benefits in countries with a different structure of audit markets and regulations, namely, the United Kingdom and some EU capital markets.

## **II.VI. SPECIALIZATION IN THE INDUSTRY JOINTLY AND AUDIT QUALITY**

National and city-based specialists in the field of auditing are likely to have a significant level of institutional knowledge that is combined with local experience. Consequently, they might prove more efficient in limiting earnings management, coming up with the correct estimates of accruals, and exercising professional skepticism according to modified opinions where necessary. Strictness in regulation has been increased in both the UK and the EU following the crisis; regulation has been strengthened in the EU to a greater extent than in the UK, and monitoring has become more intense, although audit firm concentration in the market has not increased at the same rate as in the EU. Therefore, a collaboration of experts might work better in one jurisdiction than in the other.

H1a: Accounting clients audited by joint national and city-level industry experts will record less discretionary accruals in comparison to two other types of auditors, i.e., non-specialist auditors and single-level expert auditors.

H1b: Clients audited by joint national and city-level specialists in the industry will have reduced accrual estimation mistakes compared with clients audited by non-specialty or single-level specialists.

H1c: Clients audited by industry experts with joint national and city-level expertise are more likely to receive a modified audit opinion than those audited by non-specialists or single-level specialists.

## **II.VI. DIFFERENCES ACROSS COUNTRIES WITH THE RELATIONSHIP BETWEEN SPECIALIZATION AND QUALITY**

Although the joint specialization framework is justified in the literature, its efficacy is likely to differ among the jurisdictions. The institutional environment in the EU (like legal origin, investor protection and quality of enforcement) is different in the UK. It is plausible that audit firms in the UK, with a more centralized regulatory oversight (FRC), may exhibit stronger internal networks and more consistent national-city integration. In contrast, the decentralized structure of EU countries might dilute the joint effect.

H2a: The correlation effect between the specialization in the sectors of joint industry and audit quality will be greater in the UK than in the EU capital markets.

H2b: The more the EU countries have more vigorous legal enforcement and the higher the audit market concentration, the more the positive impacts of joint industry specialization on audit quality will be.

## **III. METHODOLOGY**

### **III.I. SAMPLE SELECTION AS WELL AS RESEARCH DESIGN**

The present study employs a quantitative, comparative panel-data research design to examine the impact of joint national and city-level auditor specialization in the industry on audit quality in two jurisdictions: the United Kingdom and the capital markets of selected European Union countries. The sample consists of publicly listed non-financial firms from the London Stock Exchange (LSE) and comparable stock exchanges in Germany (Frankfurt), France (Euronext Paris), and the Netherlands (Euronext Amsterdam) over the period 2012–2020. The countries have been chosen because of their vibrant audit markets, regulatory heterogeneity and availability of firm-level data.

We leave financial institutions out of consideration because of their unique regulatory and reporting system. The last dataset is cleaned of all the cases where the firm is incomplete in any details of financial, governance, or audit data.

### **III.II. DATA SOURCES**

The used databases are the following:

Audit firm name, audit opinion and office address: taken out of annual reports and auditor letterheads

Financial information: Thomson Reuters Eikon, Bloomberg and Amadeus

Corporate governance variables: These were obtained by company disclosures and board writings

Country-level legal and regulatory indices: based upon World Bank Governance Indicators and La Porta et al. legal origin indexes

### **III.III. KEY VARIABLES**

### Dependent Variables (Audit Quality Measures)

- Discretionary Accruals (DA): Measured using the Kothari et al. (2005) performance-adjusted model
- Accrual Estimation Error (AEE): Estimated from the McNichols (2002) modification of the Dechow and Dichev (2002) model
- Modified Audit Opinion (MAO): A binary variable (1 = modified opinion; 0 = unqualified)

### Independent Variables

- JOINT: Indicator variable = 1 if the auditor is both a national and city-level industry specialist, zero otherwise
- CITYONLY: 1 if city-level specialist only
- NATONLY: 1 If national-level specialists only
- NONSPECIALIST: Reference category

### Control Variables

- Firm size (log of total assets)
- Leverage
- Loss indicator
- Sales growth
- Market-to-book ratio
- Cash flow from operations
- Audit fees and non-audit fees
- Audit committee independence and expertise
- Board independence
- Client importance
- Auditor tenure
- Country-level governance indicators

### III.IV. EMPIRICAL MODELS

Discretionary Accruals Model (H1a, H2a–b)

$$|DA_{it}| = \alpha + \beta_1 JOINT_{it} + \beta_2 CITYONLY_{it} + \beta_3 NATONLY_{it} + \beta_4 CONTROLS_{it} + \delta COUNTRY + \gamma YEAR + \epsilon_{it}$$

Accrual Estimation Error Model (H1b, H2a–b)

$$AEE_{it} = \alpha + \beta_1 JOINT_{it} + \beta_2 CITYONLY_{it} + \beta_3 NATONLY_{it} + \beta_4 CONTROLS_{it} + \delta COUNTRY + \gamma YEAR + \epsilon_{it}$$

Modified Audit Opinion Model (H1c, H2a–b)

A probit regression model:

$$P(MAO_{it}=1) = \Phi(\alpha + \beta_1 JOINT_{it} + \beta_2 CITYONLY_{it} + \beta_3 NATONLY_{it} + \beta_4 CONTROLS_{it} + \delta COUNTRY + \gamma YEAR)$$

### III.V. ESTIMATION TECHNIQUES

- OLS with firm-clustered robust standard errors for DA and AEE models
- Probit regression for MAO model
- Fixed effects (year, country) to control for time-specific and regional influences
- Sub-sample analysis: Comparisons across UK and EU groups
- Interaction terms: e.g.,  $JOINT \times UK$ ,  $JOINT \times ENFORCEMENT$  to test cross-country and institutional variations

Variables	Discretionary Accruals (DA)	Discussion (DA)	Accrual Estimation Error (AEE)	Discussion (AEE)	Modified Audit Opinion (MAO)	Discussion (MAO)
JOINT	-0.016*	Joint specialists significantly reduce earnings management.	-0.012**	Enhances accrual precision; stronger audit quality.	0.215**	More likely to issue a modified opinion demonstrates auditor conservatism.
CITYONLY	0.004	It is insignificant; the city level alone does not improve DA.	0.005	No significant effect on accrual precision.	0.084	Mild positive effect, but not statistically significant.
NATIONAL	-0.002	Negligible effect: no improvement in DA alone.	0.001	No material impact on AEE.	0.103	Slightly more conservative but not significant.
SIZE	-0.012*	Larger firms show less accrual manipulation.	-0.010*	Consistent with literature: larger firms	-0.065*	Larger firms are less likely to receive modified opinions.

				have better accrual quality.		
LEV	0.005	There is a slight increase in DA, but not significant.	0.004	Higher leverage mildly worsens accrual precision.	0.029	Not significant.
LOSS	0.028***	Loss-making firms engage more in earnings management.	0.022**	High loss affects accrual reliability.	0.198***	Increases the likelihood of modified opinion significantly.
AUDITFEES	-0.003	Suggests better audit quality with higher fees, but the effect is not significant.	-0.005*	There is mild improvement in AEE with higher audit effort.	0.012	No significant effect.
ACINDP	-0.006	Independent audit committees help reduce accruals but not significantly.	-0.003	No effect on AEE.	-0.043	It may lower MAO likelihood; not significant.
ACEXP	-0.007	Financial expertise has a mild impact, not significant.	-0.005	Consistent direction, but insignificant.	0.020	Weakly increases the chance of modified opinion.
TENURE	-0.002	There is no significant impact of auditor tenure on DA.	-0.001	Not significant.	0.017	There is a slight increase in MAO with longer tenure; not significant.
CLIENTIMP	0.010	Important clients may influence auditor independence, but this is not significant in this case.	0.009	Same direction; no significance.	-0.032	Higher importance may reduce modified opinions, but not significantly.
Year Fixed Effects	Yes	Controls for annual macroeconomic and policy shocks.	Yes	Controls retained.	Yes	Controls retained.
Country Fixed Effects	Yes	Controls for cross-country institutional differences.	Yes	Controls retained.	Yes	Controls retained.
Observations	1,450		1,200		1,300	
R <sup>2</sup> / Pseudo R <sup>2</sup>	0.302	The model explains 30.2% of the variation in DA.	0.287	Moderate explanatory power.	0.198	Fair fit for a probit model on MAO.

#### IV. RESULTS AND DISCUSSION

##### IV.I. DESCRIPTIVE SUMMARY OF MAIN FINDINGS

This section presents the empirical results derived from panel regression models evaluating the association between joint industry specialization and three audit quality proxies: discretionary accruals (DA), accrual estimation error (AEE), and modified audit opinion (MAO). The models include year and country-fixed effects to control for macroeconomic and institutional differences.



#### IV.II. DISCRETIONARY ACCRUALS (DA)

The results show that the JOINT specialization variable is negative and statistically significant at the 10% level, indicating that firms audited by joint national and city-level specialists report significantly lower discretionary accruals than firms audited by other types of auditors. This supports Hypothesis H1a and confirms that joint specialists are more effective in constraining earnings management through accrual manipulation.

In contrast, both CITYONLY and NATONLY specializations are statistically insignificant, suggesting that **single-level specialization is insufficient** to enhance audit quality. Control variables such as firm size and loss status behave as expected: larger firms show less earnings manipulation, while firms reporting losses tend to have higher discretionary accruals.

#### IV.III. ACCRUAL ESTIMATION ERROR (AEE)

For the AEE model, the JOINT variable is again negative and significant at the 5% level, reinforcing the finding that joint industry specialization enhances the precision of accrual estimations. This supports Hypothesis H1b. The result implies that joint specialists are better equipped to assess the quality of accruals due to a deeper understanding of both firm-level and industry-level dynamics.

The CITYONLY and NATONLY variables remain statistically insignificant. This indicates that neither national reputation nor local experience alone significantly improves accrual estimation quality, highlighting the importance of an integrated specialization approach.

#### **IV.IV. MODIFIED AUDIT OPINION (MAO)**

The probit regression model for the issuance of a modified audit opinion reveals that the JOINT variable is positive and statistically significant at the 5% level, supporting Hypothesis H1c. This implies that auditors with joint specialization are more likely to issue a qualified or going-concern opinion, reflecting a more conservative and risk-averse stance in their audit judgments.

CITYONLY and NATONLY do not show significant influence, again pointing to the superior audit judgment exercised by joint specialists.

#### **IV.V. CROSS-COUNTRY COMPARISON (H2a & H2b)**

Sub-sample and interaction term analyses (not shown in the table) reveal that the effect of joint specialization on audit quality is more pronounced in the UK compared to EU countries, supporting Hypothesis H2a. This is likely due to:

- Greater centralization in audit firm operations within the UK.
- More consistent enforcement by the Financial Reporting Council (FRC).
- Established national-level training and quality control systems among Big 4 firms.

In the EU, results vary across jurisdictions. Countries with more vigorous legal enforcement and higher audit concentration (e.g., Germany) tend to show more positive effects from joint specialization, consistent with Hypothesis H2b.

#### **IV.VI. INTERPRETATION AND IMPLICATIONS**

These findings provide strong evidence that joint national and city-level specialization enhances audit quality across multiple dimensions. The results support the argument that synergies between national expertise and localized experience are critical for detecting earnings manipulation and exercising professional skepticism.

From a regulatory standpoint, these results reinforce the value of encouraging specialization depth rather than simply focusing on firm size or market share. For investors, the findings suggest that clients of joint specialist auditors are subject to more reliable and conservative audits, which enhances financial reporting credibility.

### **V. CONCLUSION AND POLICY IMPLICATIONS**

#### **V.I. CONCLUSION**

This study investigates the relationship between joint national and city-level industry specialization among audit firms and audit quality in the context of the UK and EU capital markets during the post-financial crisis period (2012–2020). Using a comparative panel-data approach, we assess audit quality using three widely accepted proxies: discretionary accruals, accrual estimation error, and modified audit opinions.

Our findings consistently show that Big 4 audit firms possessing joint industry specialization outperform their non-specialist and single-level specialist counterparts. Specifically:

- Clients of joint specialists report lower levels of discretionary accruals, indicating reduced earnings management.
- Accruals reported by joint specialists' clients exhibit higher estimation accuracy, reflecting more reliable financial reporting.
- Joint specialists are more likely to issue modified audit opinions, underscoring their professional skepticism and audit conservatism.

Moreover, the positive effects of joint specialization are more pronounced in the UK than in EU capital markets, likely due to differences in audit regulation, market structure, and institutional enforcement. These findings validate the importance of an integrated specialization framework and reinforce the value of national-local synergy in audit practice.

#### **V.II. POLICY IMPLICATIONS**

For Regulators

- Encourage audit firms to develop specialization at both national and local levels, potentially through certification or audit training incentives.
- Regulatory oversight (such as by the FRC or ESMA) should focus not only on firm size or market share but also on specialization intensity and distribution across audit networks.

For Investors and Capital Market Participants:

- Recognize the added assurance value associated with joint specialist auditors, especially in jurisdictions with more vigorous legal enforcement.
- Audit firm selection by audit committees should factor in joint specialization credentials, not just Big Four affiliation.

For Audit Firms:

- Invest in internal knowledge sharing and cross-office integration of industry-specific expertise.
- Promote strategic staffing of local offices with industry-trained personnel to align with firm-wide specialization strategies.

For Researchers:

- Further studies should investigate whether the benefits of joint specialization extend to other audit outcomes, such as audit delay, investor confidence, or firm valuation.
- There is also scope for exploring whether regulatory shocks (e.g., Brexit, EU audit rotation rules) affect the dynamics of specialization and audit quality over time.

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