Received 6 February 2022
Revised 29 May 2022
27 July 2022
21 September 2022
Accepted 5 October 2022

Auditor industry expertise and external audit prices: empirical evidence from Amman Stock Exchange-listed companies

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Abstract

Purpose – This study aims to examine the relationship between auditor industry specialization (IS) and audit fees.
Design/methodology/approach – The authors utilize 2,100 firm-year data of Jordanian companies from 2005 to 2018. Two conflicting theoretical approaches of IS were employed: the product differentiation approach, as assessed by market share (MS); and the shared efficiency approach, as evaluated by portfolio share (PS).
Findings – Results of the ordinary least squares (OLS) regression support product differentiation (shared efficiency) and show that employing experts' auditors exerts a very substantial and favorable direct impact on audit fees (negative).
Originality/value – This research contributes new empirical data to the auditing literature by examining if IS does influence Jordanian businesses' audit fees. The findings offer useful data for Jordanian officials to examine the auditing industry's difficulties while refining regulations and revising auditor pricing. Additionally, the results offer advice to Jordan's regulatory bodies who oversee the auditing industry. Arguably, results from Jordan may be extrapolated to other Middle Eastern nations.

Keywords Auditor industry specialization, Market share-based, Portfolio share-based, Audit fees, Middle East, Jordan
Paper type Research paper

1. Introduction

Xerox, Enron, WorldCom and Tyco scams triggered the 2008 global financial crisis (GFC), leading to demands for improved openness, audit efficiency, integrity and trust in financial reporting

Erratum: It has come to the attention of the publisher that the article Alharasis, E.E., Alidarous, M. and Jamaani, F. (2023), "Auditor industry expertise and external audit prices: empirical evidence from Amman Stock Exchange-listed companies", *Asian Journal of Accounting Research*, Vol. 8 No. 1, pp. 94-107. https://doi.org/10.1108/AJAR-02-2022-0051, was originally published with the tables/figures presented as supplementary material via external links that do not meet Emerald's latest repository requirements; these have now been amended and the supplementary material hosted here to ensure that it remains accessible in perpetuity: https://doi.org/10.1108/AJAR-02-2022-0051

Asian Journal of Accounting Research
Vol. 8 No. 1, 2023
pp. 94-107
Emerald Publishing Limited
2443-4175
DOI 10.1108/AJAR-02-2022-0051

(Alexeyeva and Svanström, 2015). During the Great Recession, auditors' roles and actions were questioned as many financial institutions received unqualified audit opinions. It was a major failure (Alharasis *et al.*, 2021, 2022a). This situation requires more auditing industry changes, such as identifying whether auditors lack knowledge, independence or motivation to analyze organizations' financial records accurately (Shahzad *et al.*, 2018; Mardijuwono and Subianto, 2018). Specialized auditors safeguard shareholders against fraud and misstatements (Sun, 2017; Khaksar *et al.*, 2021a). Managers may show stakeholders their high-quality accounting estimations to eliminate asymmetric knowledge. This investment boosts the company's capital.

Auditors who have specialized in a particular field are called specialist auditors, for instance, those usually offer clients higher-quality services at reduced expenses (Khaksar *et al.*, 2021b; Abdillah *et al.*, 2019). Currently, there is a rising need for specialized auditors who are differentiated in the industries and companies they work for (He *et al.*, 2021; Khaksar *et al.*, 2021a). Auditors work to improve their expertise in a particular sector by learning more about the unique features of their clients (Alavitabari and Bazrafshan, 2009). Industry expertise may thus provide excellent opportunities to conduct high-quality audits on many companies with similar requirements. The quality of a company's reported financial information is closely linked to the specialization of the audit sector (Garcia-Blandon and Argiles-Bosch, 2018). By focusing on one sector, auditors are more equipped to use auditing techniques to uncover fraud and improve the quality of audits (Krishnan, 2005; Khaksar *et al.*, 2021a).

Researchers employed multiple metrics of auditor sector specialization based on Audousset-Coulier *et al.* (2016), to investigate the effect of industry specialization (IS) on audit fees. According to the audit pricing literature, auditor IS impacts audit prices inconsistently. Some studies indicate skilled auditors earn audit fee premiums, known as product differentiation (DeFond *et al.*, 2000; Fung *et al.*, 2012). Other academics believe IS reduces fees, which is known as the shared efficiency situation (Carson and Fargher, 2007; Hay and Jeter, 2011). Expert audits are more competent and charge more (fee premium) than nonspecialized auditors in the same field. Such auditors are more inclined to support stakeholders' quest for trustworthy financial information, decreasing asymmetric information created by the agency issue (Habib, 2011). Consequently, managers may provide indications regarding the reliability of stated firm finances. In shared efficiency, competition lowers audit fees for industry experts. Auditor fee reductions attract more clients and promote economies of scale. Based on this theory, competent auditors function efficiently and expertly, expending little time and energy, which reduces audit fees (Mohammadi *et al.*, 2021).

Industries with homogeneous operations and sophisticated accounting procedures pay higher audit fees (Garcia-Blandon and Argiles-Bosch, 2018). To elaborate on this, product differentiation captured by the auditor market share (MS) implies that leading auditing companies enjoy a larger MS and are therefore able to generate more revenue than those not specialized. This is owing to the notion that specialized auditors demand larger fees from their customers; in turn, the increased number of auditees significantly lowers fixed expenses. Alternatively, specialized auditors are expected to offer better quality auditing services in specific sectors, so auditees choose to employ them rather than nonspecialized auditors (Carson and Fargher, 2007; Mohammadi *et al.*, 2021). Audit companies' domination of the market may result in higher economies of scale for them since they have extensive knowledge and experience of how the sector operates. This knowledge is reinforced through training programs and lessons learned from past audit services.

Such auditors are better at detecting fraud and misrepresentation, and because they have a huge customer base from sectors, they are more able to deliver high-quality audits (Reichelt and Wang, 2010; Khaksar *et al.*, 2021a, b). This is aided by the cumulative experiences and expertise of mass numbers of auditees who need auditors with the skills for detecting fraud and misleading statements in financial records (Shahzad *et al.*, 2018). In contrast, according to the shared efficiency scenario measured by the portfolio share (PS), audit sector specialization

does not necessarily result in increased audit fees owing to the large economies of scale (Lowensohn *et al.*, 2007). Furthermore, significant competition among audit companies results in the sharing of advantage costs due to economies of scale, which ultimately leads to reduced audit prices (Khaksar *et al.*, 2021b). Overall, the most obvious benefit of sector specialization is a higher quality of company disclosure (Reichelt and Wang, 2010; Garcia-Blandon and Argiles-Bosch, 2018).

By conducting a review of the previous research on auditor specialization, it is concluded that many studies have emphasized the effect of auditor industry specialists on audit quality via various proxies yet leading to contradictory results. Although a few studies have been published on advanced economies, little is known about this subject in emerging regions, especially Jordan (Salehi *et al.*, 2019). None examined IS elements in audit pricing model (Audousset-Coulier *et al.*, 2016). To the best of our knowledge, this research contributes to the auditing literature in several important ways. First, it is the first attempt to offer further information on the nature of the connection between auditor IS and audit fees using data from emerging countries, namely the Middle East (ME) and Jordan. Based on the work of Baatwah *et al.* (2021), institutional affiliations and inherent differences result in varying judgments about the sufficiency of audit evidence (Jamaani *et al.*, 2022). Given the variations in the nature and risk of established and emerging market economies, it is worthwhile investigating the impact of IS on audit fees in Jordan.

Second, this study adds to current knowledge by examining two competing IS concepts based on the theoretical framework developed by Audousset-Coulier *et al.* (2016): the product differentiation scenario (increased fee approach); and shared efficiency scenario (reduced fee approach). Third and importantly, unlike previous research, this study builds on previous studies and solves their shortcomings by including audit fee-based metrics to calculate IS measures since Jordan is the only ME nation which since 2001 mandated listed companies to disclose audit costs documented in their annual reports. Audousset-Coulier *et al.*'s (2016) analysis on the validity of the measures of IS in empirical research confirmed that audit fee-based metrics are the favored measure proxy for industry specialist measures than the other proxies used in other research (i.e. client size and the number of clients) because audit fees accurately reflect audit work; thus, audit fees are seen as a consequence of the customer's size, sophistication and risks (Khaksar *et al.*, 2021a). Due to the nondisclosure of audit fees by companies in many nations, very little research has been done using audit fee-based measures as a surrogate for evaluating IS (Audousset-Coulier *et al.*, 2016). Therefore, findings from the audit pricing research vary regarding the effect of IS on audit fees due to using different calculation variables to estimate clientele shares, and the criteria applied to assign auditor industry specialists is also diversified. Fourth, the present research empirically validates the proposed model by examining Jordan over a relatively long period of time – 14 years, specifically 2005–2018. Fifth and finally, this research incorporates data from both the financial and nonfinancial sectors. Provided here is new evidence about the effect of IS on audit fees across various clients' portfolios.

Theordinary least squares (OLS) regression with company-clustered standard error served to carry out this study using hand-collected datasets from 150 Jordanian listed companies (2,100 firm-year observations) over the period 2005–2018. The research shows there is a strong positive (negative) correlation across IS as assessed by the product differentiation scenario (the shared efficiency scenario) using the MS (PS) metric and audit fees. The findings have serious implications for policymakers because they provide valid empirical evidence on the effect of sector specialization on audit fees. The primary consequences will pique auditors' and clients' attention by modifying the recent audit pricing models employed to determine auditing charges. This study assists Jordan's government in devising auditing practices and more precise laws that streamline and ensure the quality of audits.

The remainder of this article is structured as follows. Section 2 discusses the institutional context. Section 3 reviews the literature and formulation of hypotheses. Section 4 deals with the study methods and data. Section 5 presents the findings and the debate that follows.

Section 6 shows the robustness tests, and Section 7 concludes this paper with a summary of the main themes covered here.

2. Institutional background: the rationale behind the context

Jordan is an ME country with significant social and international ties. Governance and financial reporting have improved due to cultural and political issues being tackled effectively (Alrwashdeh *et al.*, 2022). Jordan has had great success attracting international investors during this era of globalization. External auditors' reports are greatly relied upon by international investors, Jordanian government and creditors. This is because auditors' reports provide more reliable financial information, leading to more foreign investment and better economic outcomes (Tahat *et al.*, 2018). The Jordanian government considered new rules and laws to boost international investment. External auditors in Jordan must follow international standards on auditing (ISA). ISA enhances financial reporting uniformity and consistency, helping investors make educated judgments.

Despite limited natural resources, Jordan's government has tried for decades to improve governance and openness (Abdullatif and Al-Rahahleh, 2020). When Jordan joined the International Accounting Standards Committee (IASC) in 1988, accounting methods changed significantly. The Jordanian association of certified public accountants (JACPA) formed the local accounting organization in 1989. IASC advised JACPA to deploy international accounting standards (IAS) for all Jordanian companies in 1990. All Jordanian companies covered by the Companies Law must report audited financial information (Tahat *et al.*, 2018). The 1997 "Companies Law" established Jordanian administrative processes. 1998's "Securities Act No. 23" followed. All listed enterprises must apply the international financial reporting standards (IFRS) and ISA auditing requirements, according to the Jordan Securities Commission (JSC) (Abdullatif and Al-Rahahleh, 2020). These guidelines aim to enhance consumers' access to high-quality financial data (Tahat *et al.*, 2018).

Most of Jordan's 300 audit firms are small. Big 4 auditing companies operate there (Alharasis *et al.*, 2022b). Jordan's JACPA certifies accountants (Abdullatif and Al-Rahahleh, 2020). It sets minimal fees for Jordanian independent auditors to eliminate conflicts of interest and maintain excellence. The Jordan Anti-Corruption Commission (JACC), Companies Control Department (CCD) and the JSC control external auditing. Thus, Jordan was chosen for several reasons. Firstly, Jordan's economic characteristics, legislation and business climate are indicative of ME nations (Tahat *et al.*, 2016). Jordan's results may be generalized to other ME nations. Due to common history, political systems, language, traditions and culture, the accounting study in ME nations is developing (Tahat *et al.*, 2018). Secondly, Jordan's political stability in a historically difficult area has led to advancements in Jordanian enterprises' behavior and how they present financial data. Thirdly, major changes in accounting in the area, like the adoption of IFRS-ISA in Jordan for 30 years, are channeled via political, financial and technical improvements, which impact all parts of life. Many global auditing companies have developed a presence in Jordan's auditing business (Qadourah, 2022). Long-term data show how IS affects Jordanian companies' audit fees. Finally, Jordan is the only ME country that requires listed businesses to publish audit expenses in annual reports, a practice since 2001 (Tahat *et al.*, 2018).

3. Literature review and hypotheses development

Prior research on the influence of IS impact on auditing has been scant and conflicting, with most studies undertaken in industrialized nations (Baatwah *et al.*, 2021). Studies show that experienced auditors receive audit fee surcharges, a situation referred the product differentiation scenario (DeFond *et al.*, 2000; Fung *et al.*, 2012). In contrast, other researchers find that IS reduces fees; this is shared efficiency (Carson and Fargher, 2007; Hay and Jeter, 2011; Khaksar *et al.*, 2021b). Previous studies have employed two theoretical frameworks to analyze the impact of IS

on auditing research; according to Audousset-Coulier *et al.* (2016), specialist auditors are more competent and charge a higher fee than nonspecialized auditors in the product differentiation scenario (see Mohammadi *et al.*, 2021). In this regard, better audit services in response to consumers' need for accurate financial information will eliminate asymmetric information (Gul *et al.*, 2013; Griffith *et al.*, 2015; Habib, 2011). Managers may thus provide reliable indications regarding the financial statements to relevant parties. This problem is especially important for large firms that rely on capital providers or lenders to operate. To obtain the necessary financing, such businesses must provide true financial information given by management and examined by specialized auditors (Alharasis *et al.*, 2022c; Mohammadi *et al.*, 2021). In the product differentiation scenario, auditors should charge high prices for their better services (fee premium). Therefore, the first hypothesis is posited as follows:

H1. There is a positive correlation between auditor IS as measured by MS and audit fees across Jordanian publicly traded companies.

In the shared efficiency situation, industry-specific auditors compete for business and receive modest fees. In most developing countries, family-owned small enterprises prefer cheaper audit services (Khaksar *et al.*, 2021b; Alharasis, 2021). This is because of the scenario's less clear agency issue. Fee discounts boost audit company rivalry (Abdullatif and AlRahahleh, 2020). This is typical for most developing countries, as shown in the analysis conducted by Khaksar *et al.* (2021b). By utilizing data from Iran, they demonstrated that businesses with tight political ties boost audit market competition but reduce quality and integrity. Cairney and Young (2006) and Behn *et al.* (2008) argue that specialist auditors are more competent and efficient, requiring less time and effort. According to the shared efficiency concept, increasing auditing efficiency and expertise may result in fewer hours and lower prices. Based on this the second hypothesis is posited as follows:

H2. There is a negative correlation between auditor industry specialization, as measured by PS, and audit fees across Jordanian publicly traded companies.

Overall, few accounting-based studies have assessed IS in underdeveloped nations, and none analyzed audit price models (Audousset-Coulier *et al.*, 2016). For instance, Hegazy *et al.* (2015) demonstrate that IS improves Egyptian financial reporting quality. According to the researchers, IS resulted in high-quality audits. Dao and Pham (2014) establish audit sector expertise improves audit quality in Vietnamese enterprises. Khaksar *et al.*'s (2021b) assessment of Iran indicates the negative influence of political linkages on audit competition which leads to poor audit quality. Further, Khaksar *et al.*'s (2021a) analysis in Iran discovers a significant correlation between audit characteristics and fraud detection. Our work is the first of its kind in the ME generally and Jordan specifically, examining whether IS factors affect external audit pricing. It does so by examining two competing theoretical foundations (product differentiation and shared efficiency scenarios) proxied by fee-based, which is the first time this has been done. Our hypothesized models assume that external auditors are accountable for detecting any breaches in clients' accounting information caused by the agency issue. An auditor's ability to spot these infractions is one of the factors that contribute to the audit's overall quality (Gul *et al.*, 2013).

4. Research data and sample selection

4.1 Data selection

The research data were collected manually from Jordanian listed companies' annual reports published on the Amman Stock Exchange (ASE) website between 2005 and 2018. The data for the prior years of the mandatory disclosure requirements of IFRS are not available, complete and accurate for the current analysis (Tahat *et al.*, 2016). Subsequent years' statistics are either missing or distorted because of the COVID-19 pandemic's influence. Therefore, the analysis

stops at 2018 to avoid biased results due to the impact of the coronavirus on the published accounting data. As shown in Table 1, the complete sample consisted of 235 enterprises after excluding 72 firms operating in industries with fewer than ten businesses following Chi and Chin (2011) and excluding 13 companies with incomplete data. Consequently, the ultimate sample size amounted to 150. The final selected sample belongs to two major sub(industries) as shown in Table 2. The overall number of enterprises accepted from the finance industry is 119, while the total number of firms admitted from the non-finance sector is 31.

Tables 1 and 2 are available in the supplementary material of the article.

4.2 Research design and variables measurement

4.2.1 Research design. We employ OLS regression analysis using Stata software to examine our hypotheses. We follow Audousset-Coulier *et al.* (2016) to adjust our OLS multiple regressions by accounting for firm-clustered standard errors and fixed effects for years and the industry to account for possible difference in audit fees over time and by the sector. This regression analysis assesses the influence of IS on audit fees across diverse client portfolios in emerging regions using two competing criteria based on fee following Audousset-Coulier *et al.* (2016) and Abernathy *et al.* (2019). The proposed research model introduces the following fundamental equation and subsequent modified equations to evaluate the assumptions developed:

$$\begin{aligned} LnAFEES = {} & \Phi 0 + \Phi 1 SIZE + \Phi 2 ROI + \Phi 3 sales\_GROWTH + \Phi 4 DEBIT \\ & + \Phi 5 CURR + \Phi 6 SUBS + \Phi 7 GOV\_OWN + \Phi 8 FAM\_OWN \\ & + \Phi 9 INST\_OWN + \Phi 10 BIG4 + \Phi 11 TENURE + \Phi 12 OPINION \\ & + IndFE + YearFE + \varepsilon. \end{aligned} \tag{1}$$

To examine *H1*, Equation (1) is amended by including the industry's specialism factor of the differentiation approach *ISP1* as presented in Equation (2).

$$\begin{aligned} LnAFEES = {} & \Phi 0 + \Phi 1 ISP1 + \Phi 2 SIZE + \Phi 3 ROI + \Phi 4 sales\_GROWTH + \Phi 5 DEBIT \\ & + \Phi 6 CURR + \Phi 7 SUBS + \Phi 8 GOV\_OWN + \Phi 9 FAM\_OWN \\ & + \Phi 10 INST\_OWN + \Phi 11 BIG4 + \Phi 12 TENURE + \Phi 13 OPINION \\ & + IndFE + YearFE + \varepsilon. \end{aligned} \tag{2}$$

To examine *H2*, Equation (1) is amended by including the industry's specialism factor *ISP2* of the shared efficiency approach as presented in Equation (3).

$$\begin{aligned} LnAFEES = {} & \Phi 0 + \Phi 1 ISP2 + \Phi 2 SIZE + \Phi 3 ROI + \Phi 4 sales\_GROWTH + \Phi 5 DEBIT \\ & + \Phi 6 CURR + \Phi 7 SUBS + \Phi 8 GOV\_OWN + \Phi 9 FAM\_OWN \\ & + \Phi 10 INST\_OWN + \Phi 11 BIG4 + \Phi 12 TENURE + \Phi 13 OPINION \\ & + IndFE + YearFE + \varepsilon. \end{aligned} \tag{3}$$

To retest *H1* and *2*, Equation (1) is modified by adding the IS factors *ISP1* and *ISP2* in one model as presented in Equation (4).

$$LnAFEES = \Phi 0 + \Phi 1ISP1 + \Phi 2ISP2 + \Phi 3SIZE + \Phi 4ROI + \Phi 5sales\_GROWTH + \Phi 6DEBIT + \Phi 7CURR + \Phi 8SUBS + \Phi 9GOV\_OWN + \Phi 10FAM\_OWN + \Phi 11INST\_OWN + \Phi 12BIG4 + \Phi 13TENURE + \Phi 14OPINION + IndFE + YearFE + \varepsilon. \quad (4)$$

We follow previous theoretical foundations in developing countries as devised by Abernathy *et al.* (2019), Baatwah *et al.* (2021) and Baatwah *et al.* (2022). This is done to account for many control variables, including those common factors found in the past auditing literature: *SIZE*, *ROI*, *sales_GROWTH*, *DEBIT*, *CURR*, *SUBS*, *GOV_OWN*, *FAM_OWN*, *INST_OWN*, *BIG4*, *TENURE* and *OPINION*/. All variables are defined in Table 3.

Table 3 is available in the supplementary material of the article.

4.2.2 Variables measurement. External audit fees were employed as the outcome variable in this research *(LnAFEES)*. *LnAFEES* is calculated as the natural log of total audit fees, in accordance with prior research on audit pricing (Abernathy *et al.*, 2019; Baatwah *et al.*, 2021).

4.2.2.1 Measuring auditor industry specialization (ISP1 and ISP2) factors. A review of recent studies indicates a lack of agreement over how auditor IS should be assessed (Audousset-Coulier *et al.*, 2016; Hegazy and Hegazy, 2018). However, according to Audousset-Coulier *et al.* (2016), there are five measures (weighted MS, MS cutoff, PS cutoff, largest PS and largest MS) and six proxies (the square root of assets, assets, the square root of sales, sales, audit fees, and the number of clients). These have been employed by previous scholars to find out whether an audit company specializes in a particular industry or not (see Table 4).

Table 4 is available in the supplementary material of the article.

We follow Almutairi *et al.* (2009), Audousset-Coulier *et al.* (2016), Baatwah *et al.* (2022), Khaksar *et al.* (2021a) and Khaksar *et al.* (2021b) in utilizing two frequently used metrics of IS to examine the influence of IS on audit fees. Theoretical work in auditing research (Wang, 2014; Audousset-Coulier *et al.*, 2016) confirms that employing only one measure of IS results in biased outcomes since it negates the concurrent and hypothetically contradictory effects of several aspects of IS strategies. This weighs in favor of using multiple IS measures in the same research to avoid overreliance on a single measure and capture the various dimensions of the IS strategies. According to DeFond *et al.* (2000) and Fung *et al.* (2012), the first measure depicts the product differentiation scenario by capturing the audit firm's (*ISP1*) MS. This metric implies that auditors offer a superior and unique audit service to a certain sector, for which they charge a premium rate (Mohammadi *et al.*, 2021). However, in accordance with Ettredge and Greenberg (1990) and Hay and Jeter (2011), the second metric is the PS of the industry (*ISP2*), which incorporates cost savings associated with efficiency improvements. Additionally, this metric suggests that auditors cut their prices to expand their customer base (Khaksar *et al.*, 2021b). We follow Almutairi *et al.* (2009) to have variable *ISP1* function as a dichotomous variable given a value of 1 if *ISP1* surpasses the MS threshold of 10% of the industry's total audit fees, 0 otherwise. *ISP2* is a continuous variable that measures the auditor's proportion of each industry group's total audit fees, as defined by Behn *et al.* (2008) and Audousset-Coulier *et al.* (2016).

As stated by Audousset-Coulier *et al.* (2016), the diversity of proxies used by prior research to measure auditor market and PSs, as well as the various criteria adopted to classify auditors as industry specialists, render the empirical results difficult to compare and clarify. This then raises questions regarding the validity and reliability of findings gained from these diverse measures. Some scholars stressed that the correlation between IS and audit fees is mostly unclear, owing to a lack of auditing studies on auditor IS using audit-fees based (Wang, 2014).

As a result, the conflicting findings of past empirical research on the effect of IS on audit fees motivate this study to enhance our knowledge of how industry expert auditors affect audit fees. This is done by employing more accurate proxies of IS measures which is rarely adapted by previous examinations (i.e. fee-based) due to the lack of availability of audit fee-based measures of IS for most of the early IS research (before the disclosure of audit fees became more popular); and for recent studies conducted in countries with non-publicly available audit fee data, or for research with international data or a long time period series of data.

Therefore, in the present study, the two scenarios are computed using an audit fee-based metric [1]. According to Audousset-Coulier *et al.* (2016), the proxies utilized in IS measures in previous research other than fee-based proxy (i.e. auditee size and the number of clients) lack accurate representation and consistency. To the best of our knowledge, the present study is the first to test IS factors in developing countries and is the first to use fee-based as a proxy for IS measures to explore the correlation between auditor IS and audit fees, as highly recommended by previous research (Audousset-Coulier *et al.*, 2016). Although audit fees are seldom used as a proxy for IS in the literature owing to lack of fee disclosures, audit fees are the more relevant and trustworthy metric since they seem to be a consequence of the auditee's size, complexity, risks and time required to conduct audits (Audousset-Coulier *et al.*, 2016).

The Jordanian Securities Depository Center (JSDC) issues the International Securities Identification Number (ISIN) which serves to categorize each sector. Similarly, we follow Behn *et al.* (2008) to categorize all auditors with less than ten customers annually as nonspecialists, so this excludes the influence of small-scale auditing firms with a small number of customers. Auditors MS and PS percentages by the sector over the period 2005–2018 and expert auditors for the same period using both scenarios – MS and PS – are not reported here but they are available upon request.

5. Results and discussion

5.1 Descriptive statistics

Table 5 presents the statistical analysis for all variables included in the empirical study (pooled for the years 2005–2018), encompassing mean, median, standard deviation, minimum and maximum. Audit fees constitute the dependent variable (*LnAFEES*). There is a low standard deviation of 1.14 for *LnAFEES*, with a mean and median of 9.25 and 9.1, respectively, indicating that audit fees vary little across Jordanian listed enterprises. This outcome agrees with some recent analyses in developing countries (Mohammadi *et al.*, 2021; Baatwah *et al.*, 2021, 2022; Khaksar *et al.*, 2021b). The mean of auditor industry expertise detected by *ISP1*(*ISP2*) is 0.347 (0.69), the median is 0 (0.841), and the standard deviation is 0.476 (0.338), meaning that 0.35 (0.7) of the sample customers use industry experts. The client portfolio-sharing technique is the most used strategy for auditor specialization in our sample. It is consistent with the findings of research on industrial specialization in the USA (Almutairi *et al.*, 2009), Egypt (Hegazy *et al.*, 2015) and Oman (Baatwah *et al.*, 2021, 2022).

Table 5 is available in the supplementary material of the article.

5.2 Univariate analysis: the expert vs nonexpert auditor

The findings of the univariate analysis are shown in Table 6 utilizing both parametric test (independent t test Welch's approximation) and nonparametric tests (Mann–Whitney U test). The table displays the difference in the mean and mean rank values of the outcome variable, the natural log of audit fees (*LnAFEES*), that is statistically significant between the expert and nonexpert customer samples from 2005 to 2018. The purpose of this research is to identify any systematic differences in the sample characteristics of customers of professional and nonspecialist auditors. The study divides the sample into two subsamples based on two

criteria for auditor industry competence (Habib, 2011). To begin, Panel A presents a MS-based strategy (*ISP1*), followed by Panel B, which presents a client portfolio-based approach (*PS_DUMMY*). The customer base of the two subsamples differs according to the methodology employed to identify industry expertise.

Panel A subsamples comprise 107 experts' clients and 43 nonspecialists' customers. Subsamples from Panel B contain the following: 139 customers of experts vs 11 customers of nonspecialists. The outcomes of Panels A and B indicate the mean and mean rank audit fees charged to customers of specialist auditors are greater than those charged to customers of nonprofessional auditors, where $t - value = -17.0759$ and $t - value = -3.3929$, correspondingly. The implication here is that the formers are inclined to charge larger audit fees. This finding is consistent with Reichelt and Wang (2010) and Audousset-Coulier *et al.* (2016).

Table 6 is available in the supplementary material of the article.

5.3 Multicollinearity

The Pearson correlation matrices for the outcome and explanatory variables are shown in Table 7. The multicollinearity test verifies there is no correlation among the explanatory variables in the regression models (Chi and Chin, 2011). Additionally, the mean of the VIF test does not indicate any potentially major multicollinearity concern since each model's mean VIF is less than 2.

Table 7 is available in the supplementary material of the article.

5.4 Multivariate analysis: regression analysis

The findings of three fundamental models are summarized in Table 8. Models 1–2 illustrate the effect of IS (*ISP1* or *ISP2*) on audit fees; and Model 3 illustrates the combined effect of both IS (*ISP1* and *ISP2*) variables on audit fees. At the 0.01 level, the p – values for Models 1 to 3 are incredibly significant, strongly suggesting that each model has a decent explanatory power (i.e. R^2) of 64%. The R^2 of the present models is comparable to prior research on audit fees in emerging countries (Baatwah *et al.*, 2021).

The findings of Model 1, as anticipated, support product differentiation (Reichelt and Wang, 2010; Fung *et al.*, 2012; Hegazy *et al.*, 2015) and show the relationship between the auditor industry expertise (*ISP1*) and audit fees is significant and positive at the 0.001 level ($Coeff. = 0.211$ *and* $t = 2.87$). Reichelt and Wang (2010) and Fung *et al.* (2012) have made similar observations. Expert auditors are more inclined to comply with stakeholder requests for completely reliable financial information, in line with signaling and stakeholder theories (Habib, 2011). Auditors demand an audit fee premium from interested parties to send a message about the reliability of accounting figures. This analysis is supported by a recent finding of developing country evidence, that of Iran conducted by Khaksar *et al.* (2021a) which confirm that auditor characteristics will lead to less financial fraud. Accordingly, H1 confirms that product diversification scenarios need higher audit costs, and the analysis accepts this.

Model 2, on the other hand, supports the concept of shared efficiency and demonstrates that auditor industry expertise (*ISP2*) is statistically significant and negatively correlated at the 0.001 level ($Coeff. = -0.494$ *and* $t = -2.95$). This outcome is consistent with the efficiency gains associated with shared auditing. According to portfolio metrics, un-tabulated univariate analysis reveals those non-Big 4 auditors account for most industry specialists [2]. Consistent with Almutairi *et al.* (2009) and Audousset-Coulier *et al.* (2016), the strategies for assigning the greatest PSs result in fee reductions, and this may reflect the scale economies (i.e. audit companies charge reduced costs for their major clients). This is consistent with Numan and Willekens (2012), who demonstrated that auditor sector experience exerts a strong and beneficial influence on audit fees. As well, our research is consistent with Behn *et al.* (2008) and Audousset-Coulier *et al.* (2016) in those expert auditors receiving lower payments in

the shared efficiency scenario, which is the situation in Jordan (Abdullatif and Al-Rahahleh, 2020). They create economies of scale as suggested by Cairney and Young (2006).

This result aligns with evidence from Iran, which was investigated by Khaksar *et al.* (2021b), confirming that countries with high political involvement in an industry experience more competition in auditing but the quality of audits is poorer (audit fee in the present study). The conclusion agrees with the triangulation of the agency, signaling and stakeholder theories, meaning that expert auditors are more likely to offer cheaper fees in the shared efficiency scenario (PS) than nonspecialists (Griffith *et al.*, 2015). On the other hand, expert auditors provide better audit quality that satisfies stakeholders' need for reliable financial documentation (Gul *et al.*, 2013; Rahman *et al.*, 2016). This might help managers communicate the reliability of financial data to interested parties. As a result, the analysis accepts H2, meaning that the scenario of shared efficiency results in reduced audit fees. Added to this, the findings of Model 3 corroborate the regression outcomes given in Models 1–2.

Table 8 is available in the supplementary material of the article.

6. Robustness checks

6.1 Excluding the big 4 variable

In Table 9 in Models 1 and 2, we confirm that the findings of the primary analysis were not influenced by an auditor type variable (*BIG4*). In fact, all the findings are identical to those reported in the original analysis.

Table 9 is available in the supplementary material of the article.

6.2 Excluding the crisis year

Because the period being studied coincides with the GFC, further analysis is carried following Alexeyeva and Svanström (2015) to ensure that the main regression findings are resilient to the inclusion of a sample year that may have been influenced by the crisis. After eliminating the company-year observations for the year 2008 from the whole utilized observations in the main analysis, the hypotheses were then retested (Models 1–2). As a result, the entire sample was reduced by 150 firm-year observations. The replications' findings corroborate the initial analysis.

6.3 Dealing with endogeneity in relation to the auditor type

Following Baatwah *et al.* (2022), to remove concerns about potential endogeneity of auditor self-selection, the two-stage Heckman test was implemented. The findings obtained are still consistent with the primary analysis.

6.4 Alternative measure of auditor industry expertise: weighted market share (WMS)

Following prior research (Almutairi *et al.*, 2009; Audousset-Coulier *et al.*, 2016; Hegazy *et al.*, 2015), WMS analysis demonstrates one approach capturing the complementary relationship between the MS and PS attributes of audit specialists. WMS is measured by multiplying the auditor MS by auditor PS. The WMS cut-off approach is a combined cutoff of both attributes of specialization, MS and PS cutoff. WMS is a dummy variable coded 1 if the WMS value exceeds a certain WMS cut-off level, 0 otherwise. Therefore, the current study contributes substantially to the auditing literature by testing the MWS measure as an alternative measure of IS for the first time (Audousset-Coulier *et al.*, 2016). Table 10 below presents the analysis results of the tested models using the WMS measure. The WMS factor impact on audit fees emerges as being significantly positive at the 0.001 level (*Coeff.* = *0.274 and* $t = 4.16$). Thus, the regression analysis firstly, supports the primary analysis results and secondly, confirms that employing expert auditors leads to higher audit fees. The finding also

confirms that firms seeking high-quality audits usually recruit specialist auditors. This, in turn, minimizes the agency conflict, conveys positive signals to stakeholders and confirms the validity of financial information given to shareholders on how resources in a company should be allocated (Khaksar *et al.*, 2021a).

Table 10 is available in the supplementary material of the article.

7. Conclusion

This study offers empirical findings regarding the influence of auditor sector competence on audit fees utilizing hand-collected datasets from 2,100 firm-year samples from 150 Jordanian businesses from 2005 to 2018. Prior research on auditor professional experience has produced fragmentary results, with several research findings concluding that industry specialists receive a fee premium based on product differentiation, while others discover that employing expert auditors results in fee reductions, i.e. based on shared efficiency. Two fundamentals theoretical foundations have been used to identify industry specialists: MS and customer portfolios. Industry expert metrics quantified the effect of industry experts on audit fees.

When a customer chooses expert auditors discovered by a MS-based scenario, the correlation between industry specialists and audit fees is strengthened. The research supports the triangulation of agency, signaling and stakeholder theories since auditing requires more attention from auditors and especially to be alert to agency conflict. In this situation, auditors may assist stakeholders' desire for transparent/fully disclosed and reliable financial information, hence mitigating the agency problem. Concerning the impacts of auditor industry experience on audit fees as determined by shared efficiency scenarios, the study reveals the reverse. Compatible with the agency, signaling and stakeholder theories, expert auditors are much more inclined to offer lower audit fees than nonspecialists under the shared efficiency scenario, owing to cost savings from efficiencies or the competition between auditors.

This research assists scholars, auditors and Jordanian government agencies accountable for the sector (i.e. JACPA). This study supports Jordanian regulators by updating an auditing model with IS variables. The results may be employed to set audit fees and inform policymakers about auditing problems in Jordan. This study might assist accounting policies, procedures and fees. This report will help Jordan's authorities track audit businesses, requirements and expectations. This boosts the study's generalizability and application to other settings, such as other ME countries with similar auditing cultural and institutional qualities. Expanding this study to other ME countries and a longer time will help determine the impact of economic instability during the COVID-19 outbreak.

Notes

1. Earlier research did not presume a continuous or indicator variable of sector competence, and most continue to explore both. The IS features included in this study's regression include dichotomous MS and client PS measurements, according to Chi and Chin (2011) and Audousset-Coulier *et al.* (2016). Auditing research forbids measuring with both notions.
2. According to the un-tabulated independent t test and Mann–Whitney U-test findings ($t = 1.51$ and $z = 1.51$), clients of professional auditors (0.39) and nonexpert auditors (0.46) differ greatly in the mean of the Big 4 variable.

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Supplementary material

The supplementary material for this article can be found online.

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