UNVEILING THE NEXUS BETWEEN INTELLECTUAL CAPITAL AND AUDIT QUALITY IN ACCOUNTING FIRMS

Chao Meng [*], Dewi Fariha Abdullah [**], Saleh F. A. Khatib [***], Norhalimah Idris [**]

* Faculty of Management, Universiti Teknologi Malaysia, Johor, Malaysia; Faculty of Accounting, Hebei Finance University, Baoding, China
** Faculty of Management, Universiti Teknologi Malaysia, Johor, Malaysia
*** *Corresponding author*, Faculty of Management, Universiti Teknologi Malaysia, Johor, Malaysia; Faculty of Business, Sohar University, Sohar, Oman
Contact details: Faculty of Business, Sohar University, Sohar 311, Oman

How to cite this paper: Meng, C., Abdullah, D. F., Khatib, S.F. A., & Idris, N. (2024). Unveiling the nexus between intellectual capital and audit quality in accounting firms [Special issue]. *Corporate & Business Strategy Review, 5*(1), 307–318. https://doi.org/10.22495/cbsrv5i1siart5

ISSN Online: 2708-4965
ISSN Print: 2708-9924

Received: 09.08.2023
Accepted: 21.02.2024

JEL Classification: H83, M40, M42
DOI: 10.22495/cbsrv5i1siart5

Abstract

With the frequent occurrence of corporate financial fraud cases in China, the audit quality (AQ) of accounting firms has attracted great attention. As a knowledge-intensive organization, the intellectual capital (IC) which represents the intangible assets seems closely related to AQ. The present study aims to investigate the relationship between IC with AQ among China's top 100 accounting firms (CTAFs) and if the extent of association varies between IC components and AQ. Data were collected through a questionnaire survey with a total of 81 firms through their responsible official. The findings demonstrate that IC significantly affects AQ of CTAFs. Surprisingly, structural capital emerged as the strongest component of IC influencing AQ, followed by relational capital, spiritual capital, and human capital. These results suggest that improving any element of IC can lead to an improvement in AQ while distinguishing the varying degrees of association. This study acts as a trailblazer, by using primary data offering empirical evidence regarding the connection between IC and AQ within the landscape of CTAFs. The particular note is the illumination of varying impact levels across elements of IC, providing unique and applicable insights for future research and practitioners.

Keywords: Intellectual Capital, Structural Capital, Relational Capital, Spiritual Capital, Audit Quality, China

Authors' individual contribution: Conceptualization — C.M. and D.F.A.; Methodology — S.F.A.K.; Investigation — C.M.; Resources — D.F.A. and S.F.A.K.; Writing — C.M.; Supervision — N.I.

Declaration of conflicting interests: The Authors declare that there is no conflict of interest.

1. INTRODUCTION

In China's four decades of reform and opening-up, the market economy has made remarkable progress, and meanwhile promoted the restoration of the Certified Public Accountant (CPA) system (Song, 2022). Aided by supportive national policies, Chinese accounting firms have experienced dramatic growth (Wen, 2022). However, corporate financial scandals continue unabated, from earlier cases like YunNan Green-Land to more recent ones such as Kangde Xin and KangMei Pharmaceuticals. These incidents all cast doubt on audit quality (AQ) of accounting firms (Feng et al., 2021). Numerous audit failures not only bring detrimental effects to the capital market but also make accounting firms suffer serious trust crises.

There exist some studies exploring AQ based on such as audit fees (Asthana et al., 2019; Ettredge et al., 2014), firm size (Francis et al., 2013; Yuxin, 2020; Zhan et al., 2020), client characteristics (S. Chen et al., 2018; Fung et al., 2022; Zhan et al., 2020) and so on. Nearly all the studies seem to be conducted around the accounting firms from different angles, rather than deeply going into the firms themselves to analyze AQ. We believe that

an accounting firm is a separate organization that has its own distinctive resources to support the quality of its products or services (Tan & Duan, 2014).

As a knowledge-intensive service industry, accounting firms are mainly composed of manpower, as a strategic resource which is the major driving factor promoting its AQ (Song, 2022). It is primarily by relying on the expertise, experience, and judgment of qualified professionals (Ni et al., 2019). To fully utilize the professional abilities of talented individuals, it is imperative to establish supportive systems such as rules, policies, and procedures (J. Chen et al., 2022). Additionally, maintaining positive relationships with relevant parties is necessary for sharing resources, promoting efficiency and innovation (Wang, 2019). Only when these factors are present can the potential of talented individuals be fully harnessed for the benefit of the organization. In addition, the ethical requirements for the auditors to maintain independence are crucial (Tobi et al., 2016). Especially when the auditors face pressure or benefits from the clients and get stuck in ethical dilemmas (Mappanyuki, 2016; Naslmosavi & Jahanzeb, 2017), it is very important to maintain a high level of independent and objective attitude. In this case, the beliefs, faith, morals, and values of the auditors are also particularly critical (Zheng & Zheng, 2021). Visibly, the level of these intangible assets will obviously affect the survival and competitiveness of an accounting firm (Kaawaase et al., 2020).

At the beginning of the 21st century, the Ministry of Finance of China and the Chinese Institute of Certificate Public Accountants (CICPA) issued a series of opinions or notices to promote accounting firms to become larger and stronger (Zhan et al., 2020). Under the favorable policy, a few strong firms have emerged. Meanwhile, several rounds of firm mergers have been completed (Deng, 2022). Although merged firms have significantly achieved expansion in scale and increase in business volume, only the unity and integration of personnel, implementation standards, development strategies, and corporate culture can truly form the competitive edge of accounting firms (Yu & Gu, 2023). Generally, large firms are expected to have more strength in risk management and can build and maintain solid relationships with interested parties, and have the capability to establish sound training and quality control systems (Cahan et al., 2021; Zhan et al., 2020), however, the shaping of culture and values is also a necessary project, to restrain human behavior. In fact, in recent years, accounting firms in China have placed special emphasis on cultural and ideological construction, to better fulfill their role as professional practitioners (Tang, 2019). As mentioned above, this is just exactly the issue of this study, intellectual capital (IC).

Specifically, this study investigates the status of IC in accounting firms in China and explores their relationship with AQ. This is achieved through a questionnaire survey of 81 top 100 accounting firms in China. The results show that IC has a strong positive correlation with AQ, and enhancing any component of IC is conducive to improving AQ. However, the impact intensity varies across components of IC, among which structural capital possesses the strongest influence on AQ, followed by relational capital, spiritual capital, and human capital. The results may seem surprising since human capital is often considered the most important (Ni et al., 2019), but the strongest correlation of structural capital with AQ is still reasonable. Talents are indeed the core resource of knowledge-intensive organizations, but human behavior should still be completed under the constraints of rules and systems. In addition, the personnel flow of accounting firms is frequent, and the organizational mechanism and norms are relatively stable, which can effectively transform people's abilities into value (Sun, 2014; Tang & Jiang, 2019). Especially, during the COVID-19 period, talents were not in the position, and the structural capital such as the regulations, control systems, and procedures highlight their advantages. The results of the study also reveal the impact of relational capital and spiritual capital on AQ in accounting firms.

This study has important implications for academia, audit practitioners, and regulators. First, this study extends the research on IC by providing evidence on the impact of all four components, including spiritual capital, on AQ. These findings not only strengthen the robustness of the resource-based view (RBV) theory but also contribute empirical data in the context of China's accounting firms, enriching the research landscape in this area. Second, the study utilized a survey to gather data, which makes the findings more precise and relevant to real-world scenarios. Last, this study has brought practitioners and regulators aware of what matters and how they are affecting AQ thus enabling them to make appropriate decisions.

This article is structured as follows. Section 1 introduces the study's background and problem statement. Section 2 highlights literature relating to the study's variables while providing the basis for the research framework. Section 3 explains the methodology adopted in this study. Section 4 presents the results. Section 5 discusses the research findings. Section 6 concludes the paper.

2. LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1. Overview of intellectual capital

It is widely accepted that IC is interpreted as the three-dimensional model (Marr & Moustaghfir, 2005), including human capital (HC), structural capital (SC), and relational capital (RC). HC refers to competence, which is certainly influenced by knowledge, skills, experience, qualifications, and education; SC represents the management architecture on which an organization depends, which is manifested as operating procedures, systems, strategies, and so on; RC basically implies the relationships with others, that can be reflected through communication, collaboration, image, and reputation (Kaawaase et al., 2020; Nancy et al., 2020). In the era of the knowledge economy, the value brought by material capital to enterprises is limited, literature has extensively documented that IC plays a significant role in an organization's success and sustainable development (Khalique et al., 2018).

Furthermore, Ismail (2005) emphasized the importance of including spiritual capital (SPC) as a critical element in the IC framework. Subsequent research have validated that SPC is an integral part of IC and works with other three components to influence organizational performance (Abdullah & Sofian, 2012; Zymonik & Dobrowolska, 2015). SPC is defined as a critical component of intangible assets that comprises essential values such as faith, morality, honesty, commitment, and motivation that have been internalized into the organizational culture (Zheng & Zheng, 2021). SPC can act as a mechanism to effectively monitor an individual's behavior and decision-making processes, thereby promoting ethical and legal compliance in their activities. Thus, SPC has a significant influence on performance and plays a vital role in strengthening the functions of the other three components of IC. Emphasis is placed on the role of SPC in organizational settings and the underlying mechanisms by which it amplifies the other constituents of IC (Abdullah & Sofian, 2012; Zheng & Zheng, 2021).

2.2. Associating human capital and audit quality

HC refers to the combined knowledge, skills, and expertise possessed by an organization's workforce, as highlighted in previous research (Bontis et al., 2000; Hui & Chen, 2019; Tang & Jiang, 2016). Given its significance as a vital resource for enhancing organizational efficiency and effectiveness, HC plays a pivotal role in improving service quality and gaining a competitive advantage (Mollah & Rouf, 2022). It is commonly anticipated that HC positively influences audit practices; nevertheless, the existing literature shows a lack of consensus on this matter.

Research by Kaawaase et al. (2020) underscored HC's importance in audit practices, yet their findings did not uphold this anticipation. Instead, they revealed a significant positive impact of SC and RC on audit practices. Similar outcomes were mirrored in the investigations of Suyono (2012), which found that staff experience had minimal impact on AQ, whereas spiritual values like independence and accountability partially affected it. Furthermore, empirical data from Bontis (1998) and Bontis et al. (2000) indicated that SC and RC considerably influenced firm performance, whereas HC did not exhibit a comparable effect. Consequently, empirical evidence challenges the assumption of a direct positive correlation between HC and organizational performance or work quality.

Investing in HC by accounting firms could potentially yield auditors with advanced knowledge and expertise, leading to enhanced AQ. This is supported by research like DeFond and Zhang (2014), Johnstone et al. (2015), and Ni et al. (2019), who linked higher education and experience of auditors to better AQ. This involves not just attracting and retaining top-tier employees but also optimizing the workforce structure and nurturing skilled audit professionals (Khavis & Szerwo, 2022). For example, investing in employee training uplifts their skills and knowledge, ultimately refining audit performance (Asthana et al., 2019). Moreover, incentivizing and recognizing employee achievements can boost motivation for improved, higher-quality audits (Bianchi et al., 2020). Additionally, experienced audit partners were found to enhance AQ by better identifying and reporting material misstatements (Cheng et al., 2021).

Furthermore, industry expertise is a pivotal facet of HC in the audit realm. It is the culmination of years of learning and training, symbolizing comprehensive human proficiency. Strengthening industry expertise is vital for accounting firms to adeptly employ professional knowledge in evaluating risks (Fleming et al., 2014; Yen et al., 2018). In the era of advanced technology and evolving economic dynamics, industry expertise becomes a pivotal asset for firms to remain competitive (Deng, 2022).

Although studies vary in their views on HC, they lay a sturdy foundation for this study and spark the subsequent hypothesis.

H1: The firm's HC has a positive relationship with AQ.

2.3. Associating structural capital and audit quality

Scholars believe that SC is what enables HC to realize value, including organizational rules, policies, management structure, and strategies (J. Chen et al., 2022). SC and HC were ever the two components of the IC model in the study of Nancy et al. (2020). Considering this point, the availability of a conducive environment provides HC with the opportunity to create value through the application of knowledge, skills, and expertise in an effective and efficient manner, thereby enhancing their contribution to the overall success (Cagáňová et al., 2019). SC is a kind of infrastructure to support HC, which is also the result of past HC activities. In addition, although it is influenced by HC, SC can exist independently of HC (Nancy et al., 2020). It remains in the organization after employees leave or even resign.

Tang and Jiang (2019) suggested that high levels of SC play a critical role in facilitating the successful integration of HC and non-human capital within knowledge-based organizations. An effective combination of HC with other resources is essential to maximize their overall impact on organizational performance, and a strong SC can facilitate the conversion of individual value into organizational value. Bontis (1998) and Bontis et al. (2000) reported that SC and RC have a statistically significant effect on organization performance, while HC does not. Similar conclusions were also validated by Kaawaase et al. (2020). Nevertheless, the importance of SC in the IC model remains evident.

Furthermore, the effective use of information technology (IT) is another important aspect of SC. The increasing use of IT has changed the way accounting firms operate, communicate, and process information. It can enhance the efficiency and accuracy of audit procedures, facilitate data analysis, and improve communication and collaboration among team members (Siew et al., 2020). The use of IT can also help accounting firms provide differentiated and value-added services to clients, such as data analytics and risk management services, which can enhance their competitiveness and reputation in the market (Yu & Gu, 2023). However, it is important to note that research presents a diversified perspective. For example,

Zhou (2018) has raised the issue that the multifaceted transformations accompanying the process of audit informatization could potentially lead to reduced audit efficiency. This transformation may also introduce risks related to institutional frameworks, data security, quality assurance, and other considerations.

Building on the preceding discussion, despite the absence of complete unanimity among viewpoints, challenges persist. The integration of SC with HC and non-human capital is undeniably pivotal within accounting firms. A strong SC can enhance the transformation of an auditor's personal value to the firm's overall value, and ultimately competitiveness in the market (Kaawaase et al., 2020). Hence, the present study aims to investigate and verify the hypothesis.

H2: The firm's SC has a positive relationship with AQ.

2.4. Associating relational capital and audit quality

The market operates as a complex network of relationships, which is crucial for participants to create value. In order to achieve their goals, organizations require relationships with various stakeholders (Kwok et al., 2019). RC of an organization plays an essential role in connecting parties, enhancing the liquidity of information and resources, and promoting collaboration between them. Scholars generally support the view that RC boosts an organization's ability to access resources within the relationship network and facilitates collaboration among participants (Lee & Lin, 2019; Nancy et al., 2020).

For accounting firms, RC primarily refers to the relationship with clients. Long-term cooperation can benefit both the accounting firm and its clients, as it allows auditors to gain a more in-depth understanding of the client's operations (Kaawaase et al., 2020). Audit tenure, for example, has been shown to positively affect AQ (Rahmina & Agoes, 2014). Meanwhile, the restricted term of the auditor may not be conducive to the accumulation of experience and the enhancement of professionals' ability, and may also lead to additional expenses for changing auditors (Rahmina & Agoes, 2014). Visibly, RC is a critical element of an organization's success, and it provides positive conditions for staff to exert their abilities in professional behavior (Lee & Lin, 2019).

Nevertheless, the issue of declining AQ may also be linked to long-term auditor-client relationships, as some studies have found that such relationships increase the likelihood of auditors issuing unqualified opinions, leading to lower AQ (Chen & Xia, 2006). This concern prompted the US to enact the Sarbanes-Oxley Act (SOX) in 2002, which introduced various measures such as auditor/ partner rotation, freezing periods for former auditors, and prohibition of non-audit services (Salawu, 2017). China has also implemented a similar requirement for a five-year audit rotation to address potential threats to audit independence, especially for central state-owned enterprises. The practice of rotating auditors is becoming increasingly common across countries, and research has demonstrated a positive correlation between auditor rotation and the quality of audits conducted (S. Chen, et al., 2018; Wang & Zhu, 2018).

It is noteworthy that the efficacy of auditor rotation may be contingent on particular circumstances, as some studies have found mixed results. For example, the benefits of audit rotation may be more significant for larger and more complex companies, where auditors require more time and resources to develop client-specific knowledge (Rittenberg et al., 2010). Moreover, the benefits of auditor rotation may be limited if the new auditor lacks experience and knowledge of the client's business operations. Therefore, it is essential to consider various factors and adopt a nuanced approach to implementing auditor rotation policies. Hence, the present study formulates the following hypothesis.

H3: The firm's RC has a positive relationship with AQ.

2.5. Associating spiritual capital and audit quality

The majority of literature on IC typically emphasizes HC, RC, and SC, however, there has been little consideration of SPC as a vital component of IC. Ismail's (2005) research suggested that SPC serves as the core value in the IC model. Some subsequent studies have recognized that SPC has a mutual impact on the other three components in the IC model (Naslmosavi & Jahanzeb, 2017).

In the auditing field, auditors must not only possess the professional ability to detect misstatements, but also demonstrate audit independence, which is specifically manifested as integrity, honesty, impartiality, and objectivity in presenting the misstatements to the public in a timely manner. Both requirements of professional competence and independence together constitute AQ, but the latter requirement, however, often becomes the cause of impaired AQ (Salawu, 2017).

Aside from technical ability, internal drivers such as spiritual pursuits, personalities, commitments, self-esteem, and values play a crucial role in human behaviors (Mappanyuki, 2016; Tang, 2019). Audit independence is commonly understood as the auditor's ability to maintain an objective and impartial mental attitude throughout the audit (Elliott & Jacobson, 1998). The inability to maintain independence, despite possessing the necessary skills, can lead to an omission of the truth by auditors. However, situations where independence is compromised typically arise due to the influence of client management in ethical predicaments, as stated by Naslmosavi and Jahanzeb (2017) and Tobi et al. (2016). In such scenarios, the individual attributes of auditors, including personal values, morality, faith, and cultural background, as elements of SPC, are crucial for preserving independence and ensuring unbiased audit behavior.

According to Mappanyuki (2016), the concept of moral sense refers to the internal regulation and impetus that drives individuals to align with moral principles and discern between right and wrong. Ethical judgment is regarded as a crucial factor influencing audit, with the degree of moral intensity varying according to specific issues in the audit domain (Johari et al., 2017). Morality and values are widely considered to be essential characteristics of individuals in knowledge-intensive organizations like accounting firms. They are internal motivators that greatly influence individuals' behavior and

decision-making processes (Craft, 2013; Tang, 2019). In particular, research on accountants in the Iranian context has shown that familiarity with the code of ethics is a key factor influencing ethical decision-making and audit opinions (Naslmosavi & Jahanzeb, 2017). These findings highlight the importance of ethics and morality in enhancing AQ.

Moreover, it is crucial to acknowledge that human behavior and decision-making can be impacted by cultural disparities. Individuals possess unique cultural literacy shaped by their region, living experience, and education environment (Eierle et al., 2021). Culture has the ability to establish a particular atmosphere and subtly shape behavior. For example, cultural differences can impact how auditors interpret and practice their profession across different countries. This effect is rooted in the ethics and culture and how these factors shape auditing procedures (Cowperthwaite, 2010; Eierle et al., 2021). It is thus clear that, how important culture cultivation and values shaping in accounting firms, will influence audit behavior and ultimately result in AQ. Drawing on the aforementioned analysis, the study sets forth the hypothesis to be justified.

H4: The firm's SPC has a positive relationship with AQ.

3. METHODOLOGY

3.1. Research design, population and sample

This study used simple linear regression for data analysis to examine the relationship between variables. Although other methods such as structural equation models (SEM) can be used, linear regression yields clear results based on the research objectives and data characteristics of this study. This cross-sectional study involves a survey of all CTAFs approved in the 2020 Comprehensive Evaluation of Accounting Firms Annual Report. The survey focused on the CTAFs, as they are geographically dispersed across the country, and reflect the overall level of accounting firms and the economic development of various regions in China. Although there are approximately 9,000 accounting firms in China as of 2020, it is widely believed that larger firms with brand and influence are typically referred to as the "top 100 firms" in the industry. In academic research, the CTAFs are commonly used as the research subjects (Huang et al., 2019; Yu & Gu, 2023). They serve the overwhelming majority of enterprise clients across the country.

Census sampling was adopted with the entire population of CTAFs. The unit of analysis in research was derived from the primary objective of the study, as it is a crucial factor in guiding and determining the data collection method (Sekaran & Bougie, 2016). The research primarily aims to investigate the relationship between IC and AQ of accounting firms. Consequently, the unit of analysis is each of the CTAFs. With a consideration for the response rate and the feedback relevance, the study chose the responsible officials, such as the partner or general manager of each firm as target respondents, who are considered to have significant influence and insight into firms' operations. This choice is in line with a study conducted by Naslmosavi and Jahanzeb (2017) in the same field.

3.2. Data collection instrument, validity, reliability

This study utilized WenJuanXing to administer an online questionnaire survey, which was distributed to target respondents by link through email and social networking software like WeChat. A thorough effort was made to ensure the collection of reliable primary data. The initial method involved sending survey links to the official emails of accounting firms, which unfortunately yielded a low response rate. Undaunted, the researcher approached firm partners at conferences, extending invitations to complete the survey. Additionally, leveraging professional relationships with staff who collaborated with partners of accounting firms allowed further responses, enhancing the depth and authenticity of the data. All 100 sets of questionnaires were sent and 81 responses (81% return rate) were obtained with all considered effective for analysis.

The target respondents were asked to rate their perceptions based on 5-point Likert scale statements. This method is commonly used in IC studies such as Bontis et al. (2000) and Kaawaase et al. (2020). The questionnaire mainly collects and understands the information on IC and AQ in the CTAFs (see Appendix), in which the IC is evaluated from four sections, including HC, SC, RC, and SPC. The questionnaire items were meticulously developed, adapted, and modified from the previous studies on IC (Earnest et al., 2015; Kaawaase et al., 2020; Tayles et al., 2007), and AQ (Mostafa Mohamed & Hussein Habib, 2013; Kilgore & Martinov-Bennie, 2014; Manita & Elommal, 2010; Suseno, 2013).

The research instrument was nevertheless subjected to reliability and validity tests. Before the actual distribution of questionnaires, a pre-test was conducted. One academic expert and one practical expert were invited to review and approve the items. Following this, reliability tests were conducted using Cronbach's alpha coefficient as the metric (Hair et al., 2007). Fortunately, in the pilot and actual studies, all variables were justified with Cronbach's alpha values greater than 0.9 (Table 1). These results illustrate excellent reliability.

Table 1. Summary of variables reliability

Variables/ dimensions	*No. of items*	*Inter-item correlation*		*Cronbach's alpha*	
		Pilot survey	*Actual survey*	*Pilot survey*	*Actual survey*
IC	33	0.594	0.408	0.978	0.958
HC	8	0.584	0.531	0.912	0.901
SC	9	0.616	0.516	0.932	0.904
RC	8	0.751	0.591	0.959	0.920
SPC	8	0.671	0.562	0.937	0.911
AQ	16	0.796	0.470	0.984	0.934

Source: Authors' calculations.

4. RESULTS

4.1. Descriptive statistics

A summary of the descriptive statistics for the Likert scale items of variables of the CTAFs is presented in Tables 2 and 3. The data collection involved the use of a five-point Likert scale ranging from "strongly disagree" (1) to "strongly agree" (5), and the mean values for all items ranged from 3.79 to 4.59. The low standard deviations in relation to the means

suggest that the computed means provide a reliable representation of the observed data.

As shown in Table 2, all the items on IC components (HC, RC, SC, and SPC) have a mean of above 4.0, and the average value of IC is between 4.22 and 4.42, which indicates that respondents are inclined to agree with the statements and agree on the importance and benefits of IC to the accounting firms. In general, the overall AQ of the CTAFs is good, with an average score of 4.14 (Table 3).

Table 2. Descriptive statistics for Likert scale items on intellectual capital

Survey items	N	Min. score	Max. score	Mean	Median	Std. deviation
Intellectual capital				**4.33**		
Human capital				**4.34**		
HC1	81	3	5	4.59	5	0.519
HC2	81	3	5	4.33	4	0.707
HC3	81	3	5	4.20	4	0.660
HC4	81	3	5	4.20	4	0.641
HC5	81	3	5	4.27	4	0.613
HC6	81	3	5	4.27	4	0.633
HC7	81	3	5	4.47	5	0.593
HC8	81	2	5	4.42	4	0.630
Structural capital				**4.22**		
SC1	81	3	5	4.23	4	0.657
SC2	81	3	5	4.23	4	0.676
SC3	81	3	5	4.41	4	0.565
SC4	81	2	5	4.05	4	0.723
SC5	81	2	5	4.12	4	0.696
SC6	81	3	5	4.20	4	0.600
SC7	81	3	5	4.37	4	0.601
SC8	81	3	5	4.15	4	0.673
SC9	81	3	5	4.22	4	0.652
Relational capital				**4.42**		
RC1	81	3	5	4.33	4	0.570
RC2	81	3	5	4.54	5	0.571
RC3	81	3	5	4.43	5	0.631
RC4	81	3	5	4.52	5	0.615
RC5	81	3	5	4.46	5	0.613
RC6	81	3	5	4.37	4	0.660
RC7	81	3	5	4.26	4	0.685
RC8	81	3	5	4.43	5	0.651
Spiritual capital				**4.37**		
SPC1	81	3	5	4.46	5	0.613
SPC2	81	3	5	4.35	4	0.636
SPC3	81	3	5	4.27	4	0.725
SPC4	81	3	5	4.16	4	0.641
SPC5	81	3	5	4.42	5	0.668
SPC6	81	3	5	4.32	4	0.629
SPC7	81	3	5	4.51	5	0.594
SPC8	81	3	5	4.47	5	0.614

Source: Authors' calculations.

Table 3. Descriptive statistics for Likert scale items on audit quality

Survey items	N	Min. score	Max. score	Mean	Median	Std. deviation
Audit quality				**4.14**		
AQ1	81	3	5	4.17	4	0.721
AQ2	81	3	5	4.12	4	0.659
AQ3	81	3	5	4.35	4	0.636
AQ4	81	3	5	4.30	4	0.660
AQ5	81	3	5	4.15	4	0.594
AQ6	81	3	5	4.20	4	0.697
AQ7	81	3	5	4.11	4	0.671
AQ8	81	3	5	3.85	4	0.726
AQ9	81	2	5	3.85	4	0.691
AQ10	81	3	5	4.26	4	0.703
AQ11	81	2	5	4.04	4	0.697
AQ12	81	2	5	4.00	4	0.707
AQ13	81	3	5	4.23	4	0.638
AQ14	81	3	5	4.07	4	0.628
AQ15	81	3	5	4.11	4	0.652
AQ16	81	3	5	4.47	5	0.572

Source: Authors' calculations.

4.2. Pearson correlation

This study employed Pearson correlation analysis to examine the strength of the relationship between IC and AQ (Table 4). This statistical method helps to quantify the strength of the association between variables.

The correlation results reveal a strong and positive association between IC and AQ of the CTAFs. All IC components are in a positive significant relationship with AQ, which implies that enhancing any of the constituents of IC would connect with better AQ for CTAFs. However, SC has the strongest relationship with AQ, followed by RC, SPC, and finally HC. This confirms SC which includes

an efficient operating system and procedures, has a significant positive influence on the AQ of the CTAFs. Moreover, RC which implies communication and cooperation with external parties, and maintaining a good brand image and reputation, also has a very strong positive relationship with AQ.

Table 4. The relationship of intellectual capital and audit quality

Variables	*HC*	*SC*	*RC*	*SPC*	*AQ*
HC	1.000	0.604**	0.703**	0.521**	0.569**
SC		1.000	0.642**	0.474**	0.703**
RC			1.000	0.711**	0.646**
SPC				1.000	0.577**
AQ					1.000

*Note: ** Correlation is significant at the 0.01 level (2-tailed). HC = Human capital, SC = Structural capital, RC = Relational capital, SPC = Spiritual capital, AQ = Audit quality.*

4.3. Regression analysis

In order to test the significance of IC as a predictor of AQ, this study proposed four hypotheses (*H1* through *H4*), and the corresponding equation was put forth to take tests by using a simple linear regression analysis:

$$AQ = i + b * IC + e \quad (1)$$

where, *AQ* is audit quality; *IC* is HC or SC, or RC, or SPC; *b* is the coefficient for *IC*; *i* is the constant value for *AQ*; *e* is regression residual.

Due to the small size of the sample and the aim to ensure generalizability, the results for adjusted R^2 are reported as opposed to R^2 (Kaawaase et al., 2020). Findings in Table 5 show that all four IC components jointly explained 60.4% of the variance in AQ. Surprisingly, SC has the strongest positive impact with 51.6% of the variance in AQ. This still further confirms that SC positively influences AQ. Besides, 49.3% of the variance in AQ is explained by RC. It considerably reflects that active maintenance of cooperation with clients, suppliers, and alliance partners, as well as regulatory guidance and suggestions, helps to improve AQ. Furthermore, the newly introduced SPC has a statistically significant influence on AQ. It reveals that 36.5% of the variance in AQ is explained by SPC. Finally, 31.9% of the variance in AQ can be explained by HC.

Table 5 The regression analysis results of intellectual capital and audit quality

Variables	*R^2*	*Adjusted R^2*	*F*	*Sig.*
IC on *AQ*	0.608	0.604***	122.785	0.000
HC on *AQ*	0.328	0.319***	38.507	0.000
SC on *AQ*	0.522	0.516***	86.317	0.000
RC on *AQ*	0.500	0.493***	78.907	0.000
SPC on *AQ*	0.373	0.365***	46.919	0.000

Source: Authors' calculations.

5. DISCUSSION

Based on the findings, it is surprising that the impact of HC comes in the last place, but it affirms that a high level of HC contributes to a higher level of AQ. This result is consistent with the finding of Mollah and Rouf (2022), who reported that HC plays a significant role in assessing service quality in an environment of competition. In addition, auditors with higher levels of education and experience have a significant contribution to audit performance (Ni et al., 2019). This includes not only attracting and retaining high-quality employees but also optimizing the employee structure and cultivating professional talents (Khavis & Szerwo, 2022). Elsewhere, providing appropriate incentives and recognition to employees for their performance can also motivate them to perform better and produce higher quality audits. This is unanimously affirmed that the audit personnel who have mastered professional knowledge and experience will get high compensation because they can make positive contributions to the quality of the audit (Bianchi et al., 2020; Hoopes et al., 2018).

While HC is undeniably crucial in the auditing industry, its impact appears the last strong when compared with other capitals. This finding somewhat aligns with the research conducted by Kaawaase et al. (2020). Their study did not confirm a positive influence of HC on audit practices, it did identify a significant positive effect of SC on the same. Conclusions mirroring these findings were also drawn in the studies by Bontis (1998) and Bontis et al. (2000), where it was discovered that while SC and RC significantly affect firm performance, HC does not have a similar impact.

Nevertheless, there could be reasons. One plausible explanation is the standardization of auditors' skillsets and knowledge, which is often dictated by strict licensing requirements and professional standards. This uniformity in HC could limit its variability, making its impact on AQ appear less significant. Additionally, the effectiveness of HC may hinge on its interdependence with other capitals. For instance, efficient systems and processes (SC) are needed for even the most skilled auditors to perform effectively, and likewise, strong client relationships (RC) could facilitate the application of HC, a viewpoint supported by Bontis (1998) and Bontis et al. (2000).

SC shows the strongest impact on AQ, which is somewhat surprising but also reasonable. This finding largely aligns with the outcomes of previous studies such as those conducted by Bontis et al. (2000), Kaawaase et al. (2020), Nancy et al. (2020), and Tang and Jiang (2019), which all emphasized the importance of SC. When employees go home, what is left in the organization represents SC. That is the knowledge considered to be generated by and located within the organization, providing the infrastructure for its HC (Abdelrhman et al., 2014). Generally, accounting firm talents flow frequently, but SC is relatively stable, that is the mechanism, rule, and process of transforming HC into value, so SC is crucial for a human-intensive organization such as auditing.

However, this finding is not consistent with the results of some earlier studies, for example, Sun (2014) found that the SC of an accounting firm did not have a significant impact on AQ. This may not be surprising, as that study took place at a time when the development of China's accounting firms was just beginning, the internal rules and regulations of the firms were not sound enough, and the regulatory mechanism needed to be improved. However, after more than 40 years of reform and opening up, as well as with the guidance of national policies, accounting firms in China have made significant progress and some even completed

a successful merger, which has been comparable to the Big 4. In this case, the role and value of SC in accounting firms are more prominent. All in all, the efficient and effective operation of audit is not solely dependent on personnel but also relies on a sound control environment, where systems, regulations, and frameworks provide essential control mechanisms to enable personnel to add value.

In the results, RC also reflects strong associations with AQ. Generally, RC is deemed to be essentially a trust mechanism, which can effectively connect organizations with alliance partners, customers, suppliers, governments, etc., and can enhance communication and cooperation, reduce costs, and obtain key resources (Xie & Tong, 2022). Moreover, for accounting firms, according to Sun (2014), RC is an important way to realize the value of IC and the role of client capital in promoting audit performance is very obvious. Maintaining good relationships and interaction with clients is a required course for accounting firms.

Additionally, in China, the government strictly regulates accounting firms and provides direction and guidance, which enables them to establish close relationships with the government (Xie & Tong, 2022). On the one hand, this RC can give firms better social resources, so that they can get higher quality items; On the other hand, this relationship also brings the corresponding political responsibility, which will play a binding role on firms, to improve the quality of audit (Wang, 2019). Besides, another important aspect of RC is the firm's reputation in the industry, which has been studied and affirmed by previous studies (Aronmwan et al., 2013). Good reputation and brand image prove the recognition from enterprises and investors on the quality of their auditing (Li, 2022).

Compared with SC and RC, an organization's SPC such as culture is regarded as an informal system, that can influence the evolution of rules and regulations, resource allocation, as well as the individual ideology, morality, psychology, and values of employees (Zheng & Zheng, 2021). This study confirms Ismail's (2005) suggestion that SPC serves as a critical component in the IC model. Moreover, this study, to a certain degree, further bolsters the findings of Abdullah and Sofian (2012) and Naslmosavi and Jahanzeb (2017), who assert that SPC engenders a mutual effect with the other three components within the IC model, and it goes beyond conventional frameworks, probing human motivations and promoting better methods thereby ultimately affecting performance. Behavior is a function of culture, so human behavior is determined by such kinds of cultural and spiritual factors, for example, biological characteristics, values, beliefs, customs, and so on (Meng et al., 2019; Zheng & Zheng, 2021).

China has always attached great importance to the construction of culture and emphasized the cultivation of values. Likewise, the craftsman spirit of the CPA industry in accounting firms, centered on loyalty, integrity, dedication, excellence, solidarity, and cooperation, and a spirit of innovation is the key to improving the professional level of the accounting team and promoting the high-quality development of the audit industry (Tang, 2019).

6. CONCLUSION

The aim of this study was to investigate the potential link between IC and its four key components with AQ in CTAFs. To achieve this objective, a questionnaire survey was conducted among 81 CTAFs, which provided valuable insights into the relationship between IC and AQ in the context of China's developing economy.

Results indicate that IC has a strong and positive relationship with AQ. As for the specific factors, the findings underscore the influence of HC, SC, RC, and SPC on AQ, with SC emerging as the most impactful, followed by RC, SPC, and HC. This highlights how leveraging resources such as efficient organizational processes, solid relationships, rich organizational culture and professional ethics, knowledge, expertise, and high spiritual values can boost AQ, providing a sustainable competitive edge for accounting firms. One key revelation is the validation of SPC as a crucial IC component within CTAFs. Although unexpectedly, the correlation of HC with AQ is the last one, undoubtedly knowledge, skills, expertise, training and education have a positive relationship with AQ of accounting firms.

Besides, this study offers a comprehensive perspective on the application of IC within accounting firms. By focusing on the Chinese audit industry, this study significantly contributes to the underdeveloped area of IC studies in the country. It expands the limited literature on IC practices in China and sheds light on the implicit yet unstructured IC practices within these firms. Moreover, this study not only provides valuable insights into the specific context of China's accounting firms but also extends the understanding of the accounting field beyond the traditional Western-dominated perspective. This expansion contributes to fostering a more inclusive and comprehensive understanding of IC practices worldwide.

The study contributes to the literature somewhat but still has some limitations. First, the primary data were obtained from respondents through the survey, with possible self-report bias. Second, the study was limited to CTAFs, and the results may only apply to accounting areas that receive audit services from these firms. Third, although the study documented good response rates (81%), the actual number of observations was still low, which may affect the wide applicability of the results.

Despite the above limitations, this study can still help in providing empirical evidence for future research. Scholars can benefit from this study by recognizing the feasibility and importance of collecting raw data through surveys, rather than using financial indicators as a proxy for research variables as before. Additionally, this study enriches IC contents by adding SPC into the IC model and empirically examines its relationship with AQ, which opens up a new direction for follow-up research and provides encouragement to explore more potential factors. Further research would also find out if factors are mediating or moderating the relationship.

REFERENCES

1. Abdelrhman, A. N., Labib, K. Z., & Elbayoumi, A. F. (2014). Measuring audit firms' intellectual capital as a determinant of audit quality: A suggested model. *Journal of Modern Accounting and Auditing, 10*(1), 59–79. https://scholar.cu.edu.eg/sites/default/files/amrnageeb/files/6-measuring_audit_firms_intellectual_capital_as_a_determinant_of_audit_quality_a_suggested_model.pdf
2. Abdullah, D. F., & Sofian, S. (2012). The relationship between intellectual capital and corporate performance. *Procedia-Social and Behavioral Sciences, 40*, 537–541. https://doi.org/10.1016/j.sbspro.2012.03.227
3. Aronmwan, E., Ashafoke, T., & Mgbame, C. (2013). Audit firm reputation and audit quality. *European Journal of Business and Management, 5*(7), 66–75. https://ssrn.com/abstract=2642722
4. Asthana, S., Khurana, I., & Raman, K. (2019). Fee competition among Big 4 auditors and audit quality. *Review of Quantitative Finance and Accounting, 52*, 403–438. https://doi.org/10.1007/s11156-018-0714-9
5. Bianchi, P. A., Carrera, N., & Trombetta, M. (2020). The effects of auditor social and human capital on auditor compensation: *Evidence from the Italian Small Audit Firm Market. European Accounting Review, 29*(4), 693–721. https://doi.org/10.1080/09638180.2019.1647258
6. Bontis, N. (1998). Intellectual capital: An exploratory study that develops measures and models. *Management Decision, 36*(2), 63–76. https://doi.org/10.1108/00251749810204142
7. Bontis, N., Keow, W. C. C., & Richardson, S. (2000). Intellectual capital and business performance in Malaysian industries. *Journal of Intellectual Capital, 1*(1), 85–100. https://doi.org/10.1108/14691930010324188
8. Cagáňová, D., Hlásniková, P. R., Vraňaková, N., & Chlpeková, A. (2019). Intellectual capital as a key factor in the automotive industry. *Mobile Networks and Applications, 24*(6), 2024–2031. https://doi.org/10.1007/s11036-018-01206-2
9. Cahan, S., Hay, D., & Li, L. Z. (2021). Audit firm merger and the strategic response by large audit firms. *The British Accounting Review, 53*(3), Article 100941. https://doi.org/10.1016/j.bar.2020.100941
10. Chen, J., Dong, W., Li, S., & Zhang, Y. (2018). Perceived audit quality, state ownership, and stock price delay: Evidence from China. *Asia-Pacific Journal of Accounting & Economics, 25*(1–2), 253–275. https://doi.org/10.1080/16081625.2016.1208573
11. Chen, J., Xu, F., & Li, B. (2022). Zhìlì zīběn duì qǐyè láodòng shēngchǎnlǜ de xiàoyìng yánjiū—jīyú GMM fāngfǎ de shùjù fēnxī [Study on the effect of intellectual capital on enterprise labor productivity — Data analysis based on the GMM method]. *Communication of Finance and Accounting, 10*, 83–87. https://doi.org/10.16144/j.cnki.issn1002-8072.2022.10.022
12. Chen, S., Li, Z., & Chi, W. (2018). Client importance and audit quality: Evidence from China. *Asia-Pacific Journal of Accounting & Economics, 25*(5), 624-638. https://doi.org/10.1080/16081625.2016.1268061
13. Chen, X., & Xia, L. (2006). Audit tenure and audit quality: Empirical evidence from China's securities market. *Accounting Research, 1*, 44–53. https://www.cfrn.com.cn/uploads/fileupload/1635/paper/200605111635.pdf
14. Cheng, Y., Haynes, C. M., & Yu, M. D. (2021). The effect of engagement partner workload on audit quality. *Managerial Auditing Journal*, *36*(8), 1068–1091. https://doi.org/10.1108/MAJ-04-2020-2635
15. Cowperthwaite, P. (2010). Culture matters: How our culture affects the audit. *Accounting Perspectives, 9*(3), 175–215. https://doi.org/10.1111/j.1911-3838.2010.00010.x
16. Craft, J. L. (2013). A review of the empirical ethical decision-making literature: 2004–2011. *Journal of Business Ethics, 117*(2), 221–259. https://doi.org/10.1007/s10551-012-1518-9
17. DeFond, M., & Zhang, J. (2014). A review of archival auditing research. *Journal of Accounting and Economics, 58*(2–3), 275–326. https://doi.org/10.1016/j.jacceco.2014.09.002
18. Deng, Z. (2022). *Research on the audit quality optimization after the merger of accounting firms* [Master thesis, Anhui University of Finance and Economics]. https://doi.org/10.26916/d.cnki.gahcc.2022.000559
19. Earnest, D. F., Chamian, N. F., & Saat, M. M. (2015). Assesing the relationship between human capital and spiritual capital on audit firm's performance. *Jurnal Kemanusiaan, 24*(2), 18–28. https://jurnalkemanusiaan.utm.my/index.php/kemanusiaan/article/view/82/77
20. Eierle, B., Hartlieb, S., Hay, D. C., Niemi, L., & Ojala, H. (2021). Importance of country factors for global differences in audit pricing: New empirical evidence. *International Journal of Auditing, 25*(2), 303–331. https://doi.org/10.1111/ijau.12222
21. Elliott, R. K., & Jacobson, P. D. (1998). Audit independence concepts. *The CPA Journal*, *68*(12), 30–34. https://www.proquest.com/docview/212281986?sourcetype=Scholarly%20Journals
22. Ettredge, M., Fuerherm, E. E., & Li, C. (2014). Fee pressure and audit quality. *Accounting, Organizations and Society, 39*(4), 247–263. https://doi.org/10.1016/j.aos.2014.04.002
23. Feng, Y.-b., Li, G., & Ye, C.-g. (2021). Literature review of audit quality measurement research. *Journal of Xi'an University of Finance and Economics, 34*(05), 39–51. https://doi.org/10.19331/j.cnki.jxufe.2021.05.004
24. Fleming, D., Hee, K., & Romanus, R. N. (2014). Auditor industry specialization and audit fees surrounding Section 404 implementation. *Review of Accounting and Finance, 13*(4), 353–370. https://doi.org/10.1108/RAF-09-2013-0109
25. Francis, J. R., Michas, P. N., & Yu, M. D. (2013). Office size of Big 4 auditors and client restatements. *Contemporary Accounting Research, 30*(4), 1626–1661. https://doi.org/10.1111/1911-3846.12011
26. Fung, S., Pham, V. T., & Raman, K. K. (2022). Client corruption culture and audit quality: The conditioning effect of the competitive position of the incumbent auditor. *Review of Quantitative Finance and Accounting, 59*(3), 1133–1171. https://doi.org/10.1007/s11156-022-01072-w
27. Hair, J. F., Money, A. H., Samouel, P., & Page, M. (2007). *Research methods for business.* John Wiley & Sons Ltd.
28. Hoopes, J. L., Merkley, K. J., Pacelli, J., & Schroeder, J. H. (2018). Audit personnel salaries and audit quality. *Review of Accounting Studies, 23*, 1096–1136. https://doi.org/10.1007/s11142-018-9458-y
29. Huang, T. C., Lin, Y. H., & Hairston, S. (2019). Is there an association between accounting firm ranks and audit quality? An examination of the top 100 accounting firms in China. *International Journal of Auditing, 23*(2), 204–230. https://doi.org/10.1111/ijau.12156
30. Hui, N., & Chen, C. (2019). Accounting firm industry expertise, intellectual capital and audit performance. *Communication of Finance and Accounting, 3*, 23–27. https://doi.org/10.16144/j.cnki.issn1002-8072.2019.03.004

31. Ismail, M. (2005). *The influence of intellectual capital on the performance of Telekom Malaysia*. Universiti Teknologi Malaysia. http://eprints.utm.my/1352/3/MazlanIsmailPBATC2005.pdf
32. Johari, R. J., Mohd-Sanusi, Z., & Chong, V. K. (2017). Effects of auditors' ethical orientation and self-interest independence threat on the mediating role of moral intensity and ethical decision-making process. *International Journal of Auditing, 21*(1), 38–58. https://doi.org/10.1111/ijau.12080
33. Johnstone-Zehms, K. M., Gramling, A. A., & Rittenberg, L. E. (2015). *Auditing: A risk based-approach to conducting a quality audit*. Cengage Learning.
34. Kaawaase, T. K., Bananuka, J., Kwizina, T. P., & Nabaweesi, J. (2020). Intellectual capital and performance of small and medium audit practices: The interactive effects of professionalism. *Journal of Accounting in Emerging Economies, 10*(2), 165–189. https://doi.org/10.1108/JAEE-03-2018-0032
35. Khalique, M., Bontis, N., Shaari, J. A. N. B., Yaacob, M. R., & Ngah, R. (2018). Intellectual capital and organisational performance in Malaysian knowledge-intensive SMEs. *International Journal of Learning and Intellectual Capital, 15*(1), 20–36. https://doi.org/10.1504/IJLIC.2018.088345
36. Khavis, J., & Szerwo, B. (2022). *Audit-employee turnover, audit quality, and the auditor-client relationship*. https://doi.org/10.2139/ssrn.4193139
37. Kilgore, A., & Martinov-Bennie, N. (2014). *The drivers of audit quality: Auditors' perceptions*. The Association of Chartered Certified Accountants. https://www.accaglobal.com/content/dam/acca/global/PDF-technical/audit-publications/pol-tp-daq2(auditors).pdf
38. Kwok, F., Sharma, P., Gaur, S. S., & Ueno, A. (2019). Interactive effects of information exchange, relationship capital and environmental uncertainty on international joint venture (IJV) performance: An emerging markets perspective. *International Business Review, 28*(5), Article 101481. https://doi.org/10.1016/j.ibusrev.2018.02.008
39. Lee, C.-C., & Lin, C.-K. (2019). The major determinants of influencing the operating performance from the perspective of intellectual capital: Evidence on CPA industry. *Asia Pacific Management Review, 24*(2), 124–139. https://doi.org/10.1016/j.apmrv.2018.01.006
40. Li, M. (2022). Research on the impact of accounting firm reputation on audit quality-based on empirical evidence of accounting firm ranking [Master dissertation, Shandong University of Technology]. https://kns.cnki.net/KCMS/detail/detail.aspx?dbname=CMFD202301&filename=1022781546.nh
41. Manita, R., & Elommal, N. (2010). The quality of audit process: An empirical study with audit committees. *International Journal of Business, 15*(1), 87–99. https://ijb.cyut.edu.tw/var/file/10/1010/img/856/V151-6.pdf
42. Mappanyuki, R. (2016). Effects spiritual influence of auditors, complexity task, ethics auditor and auditor expertise on the performance auditor withaccounting information systems with moderating variabel (Empirical study on BPKP representative office south Sulawesi). *Southeast Asia Journal of Contemporary Business, Economics, and Law, 9*(1), 2289–1560. https://seajbel.com/wp-content/uploads/2016/05/K9_33.pdf
43. Marr, B., & Moustaghfir, K. (2005). Defining intellectual capital: A three-dimensional approach. *Management decision, 43*(9), 1114–1128. https://doi.org/10.1108/00251740510626227
44. Meng, Q., Shi, J., Lu, B., & Song, Z. (2019). "Qīngxìn" de zhùcè kuàijìshī yǐngxiǎngle shěnjì zhìliàng ma — jīyú zhōngguó zònghé shèhuì diàochá (CGSS) de jīngyàn yánjiū [Does credulous CPA affects audit quality? — Empirical research based on CGSS]. *Accounting Research, 7*, 12–20. https://doi.org/10.3969/j.issn.1003-2886.2019.07.002
45. Mollah, M. A. S., & Rouf, M. A. (2022). The impact of intellectual capital on commercial banks' performance: Evidence from Bangladesh. *Journal of Money and Business, 2*(1), 82–93. https://doi.org/10.1108/JMB-07-2021-0024
46. Mostafa Mohamed, D., & Hussein Habib, M. (2013). Auditor independence, audit quality and the mandatory auditor rotation in Egypt. *Education, Business and Society: Contemporary Middle Eastern Issues, 6*(2), 116–144. https://doi.org/10.1108/EBS-07-2012-0035
47. Nancy, F., Sulistiawan, D., & Rudiawarni, F. A. (2020). Revisiting the role of intellectual capital on firms' performance: Indonesian evidence. In *Proceedings of the 17 th International Symposium on Management (INSYMA 2020)* (pp. 350–355). Atlantis Press. https://doi.org/10.2991/aebmr.k.200127.072
48. Naslmosavi, S., & Jahanzeb, A. (2017). The effect of spiritual capital of individuals on independent auditor's opinion: Evidences from Iranian auditors. *Asian Journal of Business Ethics, 6*(2), 131–152. https://doi.org/10.1007/s13520-016-0069-z
49. Naslmosavi, S., Sofian, S., & Saat, M. B. M. (2013). Intellectual capital components and independent auditor's opinion: A review on past studie. *Middle-East Journal of Scientific Research, 15*(4), 500–510. https://www.researchgate.net/publication/262689648_Intellectual_Capital_Components_and_Independent_Auditor's_Opinion_A_Review_on_past_Studie
50. Ni, J., Huang, X., & Liu, Q. (2019). Shěnjì shī gèrén tèzhēng duì shěnjì zhìliàng de yǐngxiǎng yánjiū [Research on the influence of auditor's personal characteristics on audit quality]. *Journal of Jiangxi University of Science and Technology, 40*(6), 134–138. https://doi.org/10.13265/j.cnki.jxlgdxxb.2019.06.024
51. Rahmina, L. Y., & Agoes, S. (2014). Influence of auditor independence, audit tenure, and audit fee on audit quality of members of capital market accountant forum in Indonesia. *Procedia-Social and Behavioral Sciences, 164*, 324–331. https://doi.org/10.1016/j.sbspro.2014.11.083
52. Rittenberg, L. E., Johnstone, K. M., & Gramling, A. A. (2010). *Auditing: A business risk approach* (7th ed.). Cengage Learning.
53. Salawu, M. K. (2017). Factors influencing auditor independence among listed companies in Nigeria: Generalized method of moments (GMM) approach. *International Journal of Economics and Finance, 9*(8), 191–203. https://doi.org/10.5539/ijef.v9n8p191
54. Sekaran, U., & Bougie, R. (2016). *Research methods for business: A skill building approach*. John Wiley & Sons.
55. Siew, E.-G., Rosli, K., & Yeow, P. H. (2020). Organizational and environmental influences in the adoption of computer-assisted audit tools and techniques (CAATTs) by audit firms in Malaysia. *International Journal of Accounting Information Systems, 36*, Article 100445. https://doi.org/10.1016/j.accinf.2019.100445
56. Song, T. (2022). Xīn shíqí kuàijìshī shìwù suǒ tíshēng shěnjì zhìliàng de túijìng tàntǎo [Discussion on the ways to improve audit quality for accounting firms in the new times]. *Money China, 36*, 150–152. https://doi.org/10.19887/j.cnki.cn11-4098/f.2022.36.010

57. Sun, L. (2014). Zhìlì zīběn guǎnlǐ yù kuàijìshī shìwù suǒ shěnjì yèjī shízhèng yánjiū [An empirical research on intellectual capital management and accounting firm audit performance]. *Communication of Finance and Accounting, 4*, 11–14. https://doi.org/10.16144/j.cnki.issn1002-8072.2014.12.036
58. Suseno, N. S. (2013). An empirical analysis of auditor independence and audit fees on audit quality. *International Journal of Management and Business Studies, 3*(3), 82–87. https://www.researchgate.net/publication/328343921_An_empirical_analysis_of_auditor_independence_and_audit_fees_on_audit_quality
59. Suyono, E. (2012). Determinant factors affecting the audit quality: An Indonesian perspective. *Global Review of Accounting and Finance, 3*(2), 42–57. https://www.academia.edu/12253294/Determinant_Factors_Affecting_The_Audit_Quality_An_Indonesian_Perspective
60. Tan, C., & Duan, H. (2014). Shěnjì zhìliàng zhǐ néng tìdài ma? — Láizì shízhèng yánjiū de jiélùn fēnxī [Is using substitution variable the only way to study audit quality? — Analysis based on results from empirical researches]. *Accounting Research, 7*, 89–95. https://doi.org/10.3969/j.issn.1003-2886.2014.07.012
61. Tang, Y. j. (2019). Gōngjiàng jīngshén, hóng chuán jīngshén yǔ shěnjì "gōngjiàng" péiyù — zhùcè kuàijìshī hángyè zhíyè huà jiànshè lùjìng tànxī [Craftsman spirit, red boat spirit and audit "craftsman" cultivation — Analysis of the professional construction path of the CPA industry]. *The Chinese Certified Public Accountant, 6*, 22–24. https://doi.org/10.16292/j.cnki.issn1009-6345.2019.06.002
62. Tang, Y. j., & Jiang, Y. m. (2016). Accounting firms' practice features, intellectual capital and governance mechanisms: A study from the perspective of access theory. *Contemporary Finance and Economics, 16*, 109–117. https://doi.org/10.13676/j.cnki.cn36-1030/f.2016.10.011
63. Tang, Y. j., & Jiang, Y. m. (2019). Zǔzhī yuánxíng yǔ shěnjì zhìliàng: Kuàijìshī shìwù suǒ zhuǎnzhì xiàoguǒ zài shěnshì [Organizational prototype and audit quality: The effect of orgnization structure conversion of accounting firm]. *Finance and Accounting Monthly, 13*, 116–120. https://doi.org/10.19641/j.cnki.42-1290/f.2019.13.019
64. Tayles, M., Pike, R. H., & Sofian, S. (2007). Intellectual capital, management accounting practices and corporate performance: Perceptions of managers. *Accounting, Auditing & Accountability Journal, 20*(4), 522–548. https://doi.org/10.1108/09513570710762575
65. Tobi, B. A., Osasrere, A. O., & Emmanuel, U. (2016). Auditor's independence and audit quality: A study of selected deposit money banks in Nigeria. *International Journal of Finance and Accounting, 5*(1), 13–21. https://www.researchgate.net/publication/322367140_Auditor's_Independence_and_Audit_Quality_A_Study_of_Selected_Deposit_Money_Banks_in_Nigeria
66. Trevino, L. K., & Nelson, K. A. (2021). *Managing business ethics: Straight talk about how to do it right*. John Wiley & Sons.
67. Wang, L., & Zhu, L. (2018). State ownership, auditor rotation and audit quality. In *Proceedings of the 2nd International Conference on Culture, Education and Economic Development of Modern Society (ICCESE 2018).* https://doi.org/10.2991/iccese-18.2018.261
68. Wang, Y. (2019). Signature accountants' overconfidence, social capital and audit quality. *Communication of Finance and Accounting, 6*, 29–35. https://doi.org/10.16144/j.cnki.issn1002-8072.2019.06.006
69. Watts, R. L., & Zimmerman, J. L. (1986). *Positive accounting theory*. Prentice Hall.
70. Wen, W. (2022). Taking stock and moving forward: A systematic literature review on accounting professionalisation in China, 1980–2021. *Journal of Accounting in Emerging Economies, 12*(2), 238–278. https://doi.org/10.1108/JAEE-11-2020-0292
71. Xie, X., & Tong, Y. (2022). Research on the impact of social capital on manufacturing enterprises digital transformation. *Science-Technology and Management, 2022*(05), 36–46. https://doi.org/10.16315/j.stm.2022.05.005
72. Yen, J.-C., Lim, J.-H., Wang, T., & Hsu, C. (2018). The impact of audit firms' characteristics on audit fees following information security breaches. *Journal of Accounting and Public Policy, 37*(6), 489–507. https://doi.org/10.1016/j.jaccpubpol.2018.10.002
73. Yu, M., & Gu, Y. (2023). Value breakthrough and brand breakout: Research on independent brand construction of accounting firms. *The Chinese Certified Public Accountant, 1,* 63–68.
74. Yuxin, L. (2020). Research on the impact of accounting firm scale on audit quality from the perspective of corporate strategy deviation. *Accounting and Corporate Management, 2*(1), 56–66. https://www.clausiuspress.com/assets/default/article/2020/10/26/article_1603727340.pdf
75. Zhan, J., Her, Y. W., & Chen, K. (2020). Audit quality and audit size: Evidence from auditor mergers in China. *The Journal of Corporate Accounting & Finance, 31*(3), 170–184. https://doi.org/10.1002/jcaf.22447
76. Zheng, S., & Zheng, Y. (2021). The influence of regional cultural values on the production and application of national audit results: Based on regional cultural values and local audit data. *Journal of Nanjing Audit University, 18*(6), 20–30. https://caod.oriprobe.com/order.htm?id=62399603&ftext=base
77. Zhou, Q. (2018). Dà shùjù bèijǐng xià shěnjì fāngshì de chuàngxīn jí fēngxiǎn fángfàn [Innovation of audit methods and risk prevention in the context of big data]. *Audit Monthly, 5*, 13–15. https://doi.org/10.15882/j.cnki.sjyk.2018.05.005
78. Zymonik, Z., & Dobrowolska, A. (2015). Spiritual capital as the fourth capital in a TQM organization. *Journal of Management and Finance, 13*(2), 147–155. https://cejsh.icm.edu.pl/cejsh/element/bwmeta1.element.desklight-9bf2e582-cdc3-4d45-9960-32712dbecac8

APPENDIX. SURVEY QUESTIONNAIRE

	Survey items
Human capital (HC)	
HC1	Our firm benefits from the manager's and staff's work contributions.
HC2	Our firm has a comprehensive recruitment plan and selects only the most suitable people.
HC3	Our managers and staff are able to develop new ideas, knowledge and innovations necessary to the work.
HC4	Our managers and staff are all competent, possess the most ideal level of knowledge and skills.
HC5	Our managers and staff are professional in their job functions.
HC6	Our managers and staff possess knowledge on key business risk.
HC7	Our senior management encourages and supports on staffs training, education and profession advance.
HC8	Our senior management emphasizes the importance of "knowledge sharing" among staff.
Structural capital (SC)	
SC1	Our firm has policies, procedures and instructions which are retained in manuals and databases.
SC2	Our firm establishes a good control system to enable the audit work operates effectively and efficiently.
SC3	Our firm benefits the most when a team cooperates and works very closely with other teams.
SC4	Our firm has effective systems and procedures that support creativity and innovation.
SC5	Our firm maintains a data system that is always ready for easy information access/data retrieval.
SC6	Our firm has justified regulations and systems consistent with our current position and development goals.
SC7	Our firm actively carries out "process and procedure" improvement to ensure audit quality.
SC8	Our firm has clear and open channels to facilitate communications.
SC9	Our firm has effective systems and procedures that manage important information to prevent accidental loss.
Relational capital (RC)	
RC1	Our firm is efficient in satisfying clients' wants and needs.
RC2	Our firm listens and responds to regulatory guidance and suggestions.
RC3	Our firm maintains recognized good reputation in the industry.
RC4	Our firm actively seeks to partner with clients, suppliers, alliance partners etc., to develop business solutions.
RC5	Our managers and staff can consciously maintain our brand image.
RC6	Our managers and staff have good communication and understanding with the responsible official of the clients.
RC7	Our culture strongly emphasizes to share information and learn from one another.
RC8	Our clients are loyal and interested to continue doing business with us.
Spiritual capital (SPC)	
SPC1	Our managers and staff are sincere, honest, and truthful in performing their duties.
SPC2	Our managers and staff are always motivated and committed to performing their best to make the firm stand out.
SPC3	Our managers and staff share a common belief to achieve the firm's objectives.
SPC4	Our senior management are always supportive and appreciative of staff performance.
SPC5	Our senior management are always seeking ways to promote good ethics and values within the firm.
SPC6	Our senior management encourages and supports community activities that inculcate teamwork culture.
SPC7	Being highly independent, impartial, and maintaining integrity have always been the core value of our culture.
SPC8	Organizational culture and values influence the way individuals perform their duties.
Audit quality (AQ)	
AQ1	In our firm, audit work is operated in strict accordance with the schedule and finish on time.
AQ2	In our firm, stringent time budgets will be developed for each audit area and promotes staff to meet them.
AQ3	In our firm audit work is carried out in strict compliance with auditing standards and industry regulations.
AQ4	In our firm there is a comprehensive quality control review system for professional competence and independence.
AQ5	Our firm has rarely been found negligent in litigation against it-alleging inadequate audit performance.
AQ6	Our firm always be rewarded by regulators such as trade associations and governmental departments in recent five years.
AQ7	Our firm is skillful in devising accounting treatments that help management to solve accounting problems.
AQ8	Our firm will be less affected by the plunge in the market than others in the industry.
AQ9	Our firm is resilient to technological changes.
AQ10	Our firm continues to be committed to improving the workflow and work efficiency.
AQ11	Our firm is responding well to changes in the economy, technology, policy, etc.
AQ12	Our firm represents the high-standards benchmark in the industry.
AQ13	Our firm continuously produces competitive services.
AQ14	Our firm maintains a good overall performance and success.
AQ15	Our firm is optimistic that clients will continue to choose our service.
AQ16	Our firm can always be able to obtain sufficient and appropriate audit evidence to reach convincing audit conclusions.