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Social Capital, Intellectual Capital, and Audit Fee: Conflicting Evidence from Iran

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Abstract: In the current study, we investigate the impacts of social capital (SC) and intellectual capital (IC) on audit fees among the companies listed on the Tehran Stock Exchange (TSE). Since the criteria for the norms and the networks are extremely correlated, we used a principal component analysis (PCA) to construct an index of social capital for each province between 2011 and 2016. The Pulic model is also used as a proxy for measuring value added intellectual capital (VAIC). The ordinary least squares (OLS) regression is employed in this study to test our research hypotheses as well. According to the research literature, on the one hand, investors and lenders can be more confident in the financial reporting honesty of the firms headquartered in areas with high social capital; on the other hand, auditors judge the trustworthiness of their clients based on where the firm is headquartered. Inconsistent with the prior studies, our findings show that companies headquartered in provinces with high social capital pay higher audit fees. Given that Iranian firms are under heavy financial pressure due to economic sanctions, those companies located in areas with higher social capital likely have abused the high level of trust that auditors and other groups in the market have in them and participated in earnings manipulation to mask their weak financial performance. Among the various components of IC, we found strong evidence that employed capital efficiency (ECE) and audit costs correlated positively. In short, this paper sheds light on the fact that severe financial pressures on managers may sometimes lead them to take advantage of the dark side of social capital and intellectual capital when preparing financial reports.

Keywords: social capital; norms; networks; intellectual capital; human capital efficiency; structural capital efficiency; employed capital efficiency; audit fee; Tehran stock exchange

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1. Introduction

In the world of auditing, many articles have investigated the determinants of audit fees. For example, scholars, such as Craswell et al. (1995), Cullinan (1998), DeFond et al. (2000), Ferguson et al. (2003), and Carson (2009), have investigated the impact of industry specialization on audit fees, while some researchers have focused on the role of audit firm size in audit prices (Francis 1984; Niemi 2004; Fafatas and Sun 2010; Bae and Lee 2013). A few studies have evaluated the impact of audit risk on audit fees (Hogan and Wilkins 2008; Sonu et al. 2017), although other scientists have surveyed the effect of client size on the estimation of audit fees (Carson and Fargher 2004; Kikhia 2015). Regardless of examining the linkage between the characteristics of clients and audit institutions with audit costs, special attention should be paid to social norms and networks to figure out what kind of impact they can have on the type of management behavior when preparing financial statements. According to the existing literature, we can find that firms headquartered in regions with high social capital are likely to pay lower audit fees because they participate

less in financial information manipulation (Yue 2010; Jha and Chen 2015; Chen et al. 2021; Sánchez-Ballesta and Yagüe 2021). The quality of financial reporting largely depends on the quality of the social environment (Han et al. 2010; McGuire et al. 2012). This implies that when the level of social capital in society is high, the auditors' efforts (and, therefore, audit fees) will plummet because social norms and networks reduce the risk of opportunistic behaviors (Callois and Angeon 2004). In fact, when persons do unethical things, social norms can make them feel guilty (Fukuyama 1997; Milgram et al. 1969; Cialdini et al. 1991). Akerlof (2007) argues that managers consider this guilt as a cost when making decisions. Since financial information misrepresentation is a kind of selfish behavior, executives are less likely to engage in misleading the financial statements in places with more humanitarian norms. Aside from social norms, networks can go up the perceived cost of selfish decisions through penalties and more effective monitoring (Wu 2008). When earnings management is seen as undesirable and networks can more effortlessly identify and punish earnings manipulation, executives will care about these costs. In general, social capital seems to decrease the use of earnings manipulation, due to additional costs induced by guilt, monitoring, and punishment.

Even though various studies have shown social capital can reduce opportunistic managerial behavior and, consequently, audit risk (Jha and Chen 2015; Sánchez-Ballesta and Yagüe 2021; Jha 2019), in Granovetter's view (1985), social capital sometimes can create vulnerability and enhanced opportunity for malfeasance. The business cycle and economic situation can affect the level of financial fraud, with booms and crashes causing an exaggeration of the norms of trust-based relations (Galbraith 2009). The economic situation of the Iranian market is such that the emergence of the dark side of social capital cannot be far from the mind. As for Iran's market, it can be said it has faced the worst of severe economic sanctions in recent years, causing many of its manufacturing firms to encounter disastrous financial problems (Salehi et al. 2020a; Moradi et al. 2021; Zimon et al. 2021; Tarighi et al. 2022). Given that lenders and investors cannot simply trust such companies with a high risk of collapse, firms are expected to show a beautiful picture of their financial situation so that they can obtain superior financial resources and attract more capitalists. Moreover, as management performance is largely assessed based on corporate profitability in the Iran context, managers wish to distort profits as much as possible to receive more compensation and not lose their jobs (Zimon et al. 2021; Salehi et al. 2018a). According to the bonus plan hypothesis, a manager will choose an accounting model that can increase the bonus he/she will get (Jaya et al. 2021). In Iran's economic situation, the question arises as to whether social capital can incite managers to behave more honestly, or because of the financial pressures on their company and fear of losing their job, managers abuse the public trust and auditor confidence and manipulate financial statements to mask the poor financial performance of their companies. Thus, the results of this study can undoubtedly give researchers a new perspective on social capital that, in dire economic conditions, may be used by managers as a tool to achieve their opportunistic goals. Furthermore, contrary to previous studies, such as one by Jha and Chen (2015), who had used two measures of norms and two measures of networks, social capital in this paper is measured using the most coherent and complete method consisting of ten measures of norms and networks. Since the measurement of many social norms and networks in this research has been new and innovative, the approach of this research can also greatly help to improve the assessment of social capital in the future research literature.

Furthermore, the emergence of a new knowledge-based economy has led to an increase in research on intellectual capital. In today's world of commerce, companies and organizations not only need tangible assets, but also intangible assets to achieve more success. Certainly, intellectual capital is one of the most important intangible assets of the organization and is used as a valuable tool for the development of key organizational assets. Many developed and developing countries have so far focused on how intellectual capital can affect maintaining and developing their business continuity (Riahi-Belkaoui 2003; Bayraktaroglu et al. 2019; Xu and Liu 2020; Lu et al. 2021). Although some Iranian

companies still export their products to international markets, it must be acknowledged that these products are not yet able to compete with foreign products that are made using the latest technology and knowledge in the world. Besides, in the domestic market of Iran, weaker and smaller companies that have more limited financial resources and assets than well-known companies are not able to compete sustainably in times of financial crisis. Therefore, it is expected that the existence of intellectual capital can be the basis for the growth of companies' business activities in the face of financial difficulties. In other words, if corporate executives have better intellectual intelligence, corporate financial performance can be significantly improved (Jaya et al. 2021), for they can solve complications quicker and cause firms to continue to activate smoothly every day (Schultz and Schultz 2020). Nevertheless, intense pressures sometimes may cause managers to use their intellectual intelligence to manipulate financial statements (Jaya et al. 2021). Consequently, in the difficult financial situation of the Iranian market, the second purpose of this study is to investigate whether Iranian managers use intellectual capital to increase the wealth of shareholders or try to demonstrate their performance better by manipulating financial information. If managers use the potential of intellectual capital to improve the company's true financial performance and increase shareholder wealth, the likelihood of financial information manipulation and profit management is reduced, which in turn declines audit risk and auditors' fees and otherwise, the audit fee will increase. Overall, in unfavorable economic conditions, the results of this study will also show what role intellectual capital and each of its components can play in the decisions of managers.

The rest of the aforementioned research is organized as follows: the following section frames the study into a theoretical framework, hypotheses development, and literature. The third section deals with how to collect data and select research samples as well as design research models. Section 4 presents the main results and implications drawn from statistical analyses and the next section after presents the discussion. Finally, we present the concluding remarks.

2. The Theoretical Framework, Hypotheses Development, and Literature

According to agency theory, a manager as an agent is given the power to operate the firm by principals or interested parties to work, with the aim of corporate performance advancement (Sari and Astika 2021). The agency theory also clarifies the assumption that humans are self-interested, have bounded rationality, and hate risk (Eisenhardt 1989). Owing to this human nature, directors tend to earnings management by maximizing the competencies of the firm (Sari and Astika 2021). The agency theory argues that since there is a conflict of interest between managers and owners, auditing has an extremely important place to resolve this conflict (Salehi et al. 2017). Two general categories affect audit fees. The first group is the client characteristics, and the second one is relative to the features of the audit firm (Salehi et al. 2019a). More time spent and more experience of experienced team members other than the lead partner is associated with better audit quality; thus, when audit quality improves, it will be costly to the client (Aobdia et al. 2018). Regarding the first group, which is related to client features, various elements, such as firm size, corporate profitability, cash compensation of the board, non-CEO executive tournaments, CEO pay cuts, CSR disclosure, and many other cases, can affect audit fees (Salehi et al. 2018a; Salehi et al. 2019a; Bryan and Mason 2016a; Bryan and Mason 2017; Jia 2017; Musah 2017). As regards the second set, which is related to audit firm traits, numerous factors, such as the industry-specific expertise of audit firms, the long-term working relationship between the audit firm and client, audit firm rotation, audit committee, audit firm size, and so on, are connected with the audit costs (Corbella et al. 2015; Yen et al. 2018; Naser and Hassan 2016). Of course, in addition to the characteristics of companies and auditors, one cannot overlook the leading role of the macroeconomic conditions in audit pricing.

Economic sanctions can increase costs to customers and businesses in the countries that issue them, for the target country is unable to purchase goods, leading to economic loss through unemployment, as well as production loss. Quite a bit of harsh financial sanctions

has been imposed on Iran after the commencement of its nuclear activities (Bolgorian and Mayeli 2019). When a country's economy is faced with a financial crisis, companies face many financial problems, and even at the lowest level of inflation, the true value of the firm will be vulnerable (Ifeanyi and Chukwuma 2016). At the time of the economic crisis, company management may distort accounting profit because of the motives of the capital market and contracts (Ahmad-Zaluki et al. 2011). In Iran, the inflationary downturn has become apparent as one of the indicators of the economic crisis in recent years. The phenomenon of inflationary recession is the simultaneous occurrence of two economic problems, namely, the high inflation rate and low economic growth rate, which impose many adverse consequences on society. Unfortunately, the inflation rate and the exchange rate in Iran have increased strikingly in recent years. In addition, the economic growth rate has dropped dramatically, reflecting the intensification of the phenomenon of inflationary stagnation in Iran (Moradi et al. 2021). In economics, inflation is a sustained increase in the general price level of goods and services in an economy, which takes place over a while. According to agency theory, auditing is like a commodity that is a function of the principle of cost–benefit. Therefore, from the point of view of the agency hypothesis, auditing is also a service that will not be excluded from this principle (NikBakht and Tanani 2010). If inflation in the country's economy, such as Iran, is significant, it can be considered as one of the influential and important factors in determining audit fees. A review of the research background shows that there are two opposing theories about the process of profit management during the economic crisis—contract theory and signaling theory (Mohammadrezaei et al. 2017). In line with the interests of investors, the contract theory in times of economic crisis predicts that corporate executives engage in income-decreasing earnings management to obtain the benefits of the creditors. For example, according to evidence from Malaysian companies during the Asian financial crisis, Ahmed et al. (2008) realized that income-decreasing earnings management for debt renegotiating companies are associated with higher market values of equity and are not related to a company's future earnings. On the other hand, discretionary accruals for non-debt renegotiating firms are not connected with stock prices, but they are positively linked to future earnings.

Contrary to contract theory, signaling theory predicts that corporate executives manipulate their profits during the economic crisis. This theory states that investors assume that discretionary accruals items are a specific indication of information about the future performance of a company (Mohammadrezaei et al. 2017). This implies that the relationship between optional accruals and market value should be positive. Therefore, optional accruals have a positive effect on the company's stock prices. In times of economic crisis, since most companies have lower incomes, they have more motivations for income-increasing earnings management so that they can compensate for their weak operational performance (Ahmad-Zaluki et al. 2011; Mohammadrezaei et al. 2017). Needless to say, many managers of companies that have been affected by the financial crisis increase corporate profits to prevent a sharp fall in stock prices (Charitou et al. 2007). For instance, Ahmad-Zaluki et al. (2011) found that that the amount of income-increasing earnings management in Malaysian IPOs is increased during a period of severe economic stress. In the Iran context, Mashayekhi et al. (2006) inferred that when the cash flow from operations decreases, which reflects the poor performance of the business unit, directors of Iranian companies tend to increase their profits by increasing optional accrual items. In other words, the drop in corporate profits can create an incentive for Iranian companies' directors to make income-increasing earnings management. In Iran's economic turbulence, Salehi et al. (2018b) also asserted that firms are fond of income-increasing earnings management activities, to mask their poor performances so that they can attract the confidence of domestic and foreign investors. More important, due to corporate financial difficulties affected by sanctions, the company's financial power does not allow it to pay great rewards to management. Surprisingly, the assessment of the performance of Iranian companies is based on accounting profit; therefore, since the choice of accounting method is a determinant of the management performance, the executives are expected to manipulate the accounting figures (Salehi et al.

2018a). Auditors are likely to view earnings management as a signal of increased risk; hence, they should conduct more extensive substantive testing to reduce the overall risk associated with the audit, leading to higher audit fees (Salehi et al. 2018a; Bryan and Mason 2017; Chia et al. 2007; Greiner et al. 2013; Bryan and Mason 2016b). In short, evidence suggests that the conditions of these days of the Iranian economy are based on the signaling theory. It is worth keeping in mind that, in times of crisis, the rate of credits granted by Iran's government is determined. Given how to determine the rate of granting credits to individuals and also the country's inflationary recession, companies do not seem to be able to negotiate to cut their bank interest rates during the crisis (Mohammadrezaei et al. 2017).

2.1. The Relationship between Social Capital and Audit Fees

Before beginning the discussion, it must first be determined what is meant by social capital. The earliest quotation surrounding social capital was from 1916, when Lyda Hanifan wrote a report on rural schools in West Virginia. He believed that the existence of social capital is very important for having a successful school (Aghajanian 2016). Nevertheless, Portes (1998) thinks that the general concept of social capital comes back to Durkheim's advocacy of group life and its advantages. It seems that social capital is one of the new concepts that is used today in various studies by sociologists, economists, and political scientists. In fact, social capital is the product of human society and can be regarded as the bridge between economics and sociology. From the economic attitude, the norms that result in collaboration and teamwork are social capital (Jha and Chen 2015). Social capital has been defined by various scholars; for instance, Portes (1998) defines social capital as the desire of society to fulfill its obligations. Guiso et al. (2004) also define SC this way "The level of mutual trust and humanitarian tendencies that exist among people in a community." In another interesting definition of SC, Guiso et al. (2008) suggest that SC is a set of morals and beliefs that make sense of cooperation and assistance in society. In addition, Woolcock (2001), and Jha and Chen (2015) indicated that SC is the norms and the networks that expedite collective action. Another interesting point—networks are examples of social interactions that can be formal or informal (Putnam 2000). Informal networks are groups of people who carry out targeted and organized works. In other words, informal networks often refer to flexible and self-contained activities, such as eating or drinking after lunch with colleagues or talking to neighbors. However, formal networks include a range of civic associations, such as school service groups (e.g., parent and teacher associations), recreational groups (e.g., sports clubs), work-related groups (e.g., professional and labor organizations), religious groups, and so on. We argue that the formal and informal networks can overlap each other so that if someone is involved in a formal network, it is likely to be present in informal activities. Moreover, when individuals become members of a network, they have social protection and will obtain more information at a lower cost.

Trust is identified as one of the main components of social capital because it creates cooperation among members of a group (Putnam 1993a). Trust and reciprocity consist of reliable fairness, general honesty, and acts of usefulness (Schaefer-McDaniel 2004). Trust is said to be at the heart of social capital and can reduce the level of costs of social and economic interactions (Field 2003). Even scientifically, social capital has a deterrent role in preventing corruption, fraud, and misconduct in various fields (Buonanno et al. 2009; Jha 2019; Manning 2018). Trust can improve economic growth among countries (Miniesy and AbdelKarim 2021). Trust can lower transactional costs, facilitate inter-organizational relationships, and improve manager–subordinate relationships (Doney et al. 1998). However, it seems that if people abuse public trust, there will be adverse and unfortunate consequences for society (Manning 2010). In short, on the one hand, the amount of audit fees is positively linked to the extent of an audit firm's efforts and litigation risks (Simunic 1980). On the other hand, trust would likely affect the audit firm's efforts and the perceived litigation risks. For these reasons, auditors spend more time on those firms located in low social-capital areas to reduce the audit risk because they do not trust their clients, which will lead to increasing the audit fee (Jha and Chen 2015). Thus, audit firms are expected to

evaluate the honesty of their clients based on where the companies are headquartered and charge more audit fees when they have less confidence in the uprightness of the companies.

More specifically, social norms represent intrinsic motivation for selflessness, and network density represents an extrinsic motivation for selflessness. Based on Woolcock (2001), the social norms and networks that enable collective actions are called social capital. This implies that norms and networks are two inseparable concepts. In keeping with this view, some studies have shown that a strong social network can improve the quality of social norms (Jha and Chen 2015; Fukuyama 1997). Hence, similar to the Jha and Chen (2015) approach, this research does not consider the social norms and networks as two separate elements and relies on the Woolcock (2001) definition. Given the prior research literature, it is expected that the social norms and networks of high social capital regions induce managers to behave more honestly, which will lead to manipulating accounting figures (Jha and Chen 2015; Chen et al. 2021; Sánchez-Ballesta and Yagüe 2021; Jha 2019). According to the findings of Fukuyama (1997), Milgram et al. (1969), and Cialdini et al. (1991), it has already been proven that social norms can induce a sense of guilt when an individual behaves disparately. This sense of guilt can be seen as a cost, and executives take this cost into account when making decisions (Akerlof 2007). Since financial information manipulation is seen as selfish, this theory suggests that executives are less likely to engage in misleading the financial statements in counties with more altruistic norms, compared to counties where altruism is less important. With respect to social networks, they can build more trust among their members over time and establish a culture based on the principles of cooperation and collaboration (Jha and Chen 2015). Fukuyama (1997) believed that people support each other well when there are repeated games in a dense network. With the passage of time, this process becomes an accepted ethical principle in society that invites everyone to promote mutual trust as well as abide by their commitments (Jha and Chen 2015). Not only does a strong social network encourage good behavior, but it also enhances the punishment for deviant behavior (Coleman 1994; Spagnolo 1999). Social networks can increase the perceived cost of selfish decisions through punishment and more effective monitoring (Wu 2008). These costs seem to be reflected in earnings management; if distortion in the financial statements is seen as undesirable and networks can more easily detect and punish earnings manipulation, executives will take these costs into account. This, in turn, decreases the expected benefits of earnings management, ultimately decreasing the likelihood that executives will engage in earnings management in counties with high network density. As a result, social capital is expected to decrease the use of earnings manipulation, because of extra costs induced by guilt, monitoring, and punishment.

In this research, a key question is raised that—given managers of Iranian companies are under heavy financial pressure due to severe economic sanctions—can norms and social networks still prevent their opportunistic behaviors? In other words, can social norms induce a sense of guilt especially in situations that Iranian managers, to survive in a financial crisis, have great motivations for conducting profit management activities to convey a more attractive picture of their financial situation? Do social networks increase the perceived costs of selfish decisions through punishment and more effective monitoring? To find answers to these questions, it is best to look at Iran's market conditions to evaluate better the impact of social capital on managerial behavior. Answering this question is like a double sword. On the one hand, given the prior research literature, it is expected that the social norms and networks of high social-capital regions induce managers to behave more honestly, which will lead to decreasing audit risk and audit fees (Yue 2010; Sánchez-Ballesta and Yagüe 2021; Jha 2019). On the other hand, Iranian managers are not expected to be impressed by socially positive values and not adhere to professional ethics when preparing financial statements, which would increase auditing fees. Social capital measures the level of mutual trust in a location (Jha and Chen 2015). Trust between a firm and both its stakeholders and investors are built through social capital (Lins et al. 2017). Trust between an auditor and its client also depends on the quality of the social capital in which a company is located (Jha and Chen 2015). Accordingly, in addition to

investors, lenders, and others who can be more confident in the honesty of the behavior of managers operating in areas with high social capital, auditors judge the trustworthiness of their clients based on where the firm is headquartered. Therefore, given that Iranian managers are under heavy financial pressure due to economic sanctions, those companies located in areas with higher social capital are expected to abuse the high level of trust that auditors and other groups in the market have in them. In other words, from the perspective of the managers of these companies, it is very unlikely that auditors and others will be pessimistic about the accuracy of the financial reporting. For this reason, these executives may abuse the high trust of others in themselves and try to better show their poor financial performance by manipulating accounting figures. Consequently, it is anticipatable that the first hypothesis of the research is as follows:

Hypothesis 1 (H1). *There is a significant relationship between local social capital and audit fees.*

2.2. The Relationship between Intellectual Capital and Audit Fees

Many definitions of intellectual capital (IC) have been presented so far by various scholars (Sari and Astika 2021; Kehelwalatenna and Gunaratne 2010). In general, intellectual capital is a multi-dimensional structure, not a one-dimensional one; this structure talks about various important concepts, such as knowledge, business processes, organizational communications, and other forms of logical property (Xu and Liu 2020; Jafarnezhad and Tabari 2018). In the accounting language, one can say that the difference between market value and replacement cost of a company's assets is called intellectual capital. Although in the twentieth century most corporations tended to have more physical assets to generate wealth, the third millennium is a knowledge-based economy. According to resource-based theory (RBT), firms will be able to achieve a competitive advantage if they have superior resources, which can be in the form of tangible and intangible assets (Sari and Astika 2021). Based on the RBT theory, as skills, competencies, knowledge, and experience as intellectual capital resources are a kind of rare tactical resources, company-specific and difficult to mimic, they can be the leading causes of the firm's competitive plus (Zeghal and Maaloul 2010; Welly et al. 2021). Intellectual capital is an intangible asset in the form of resources, capabilities, and competencies that can improve organizational performance (Bontis et al. 2000; Tseng and Goo 2005; Jaya et al. 2021). In other words, intellectual capital is considered as an intangible asset that is not listed on the corporate balance sheet, but since it reflects the relationships among employees, ideas, creativity, and information, and measures what is not seen, it can play a significant role in the corporate financial performance improvement (Edvinsson 1997; Welly et al. 2021). In general, in today's business world, investors and buyers are becoming more and more aware of various business issues due to intense competition (Welly et al. 2021). Due to the rapid changes in today's business environment, companies have to adapt to these business changes more quickly through intellectual capital to be able to compete with their competitors (Obeidat et al. 2017; Azmi et al. 2020; Welly et al. 2021).

According to the stakeholder theory concept, Pulic (1998) classifies intellectual capital in terms of value-added obtained from the difference between the firm's revenue (input) and all costs (output). The added value of intellectual capital is divided into employed capital, human capital, and structural capital (Jaya et al. 2021). Although each constituent of intellectual capital is not the same in nature, they are interconnected within a firm like links in a chain, which in turn offers a competitive advantage in line with RBT theory (Barney et al. 2011; Han and Li 2015). Regarding human capital as the most important component of IC, it is a set of skills and technical expertise, and knowledge of the workforce in the fields that are essential to the success of the organization (Welly et al. 2021). Theoretically, human capital is conclusively believed to be positively related to economic growth (Ali et al. 2018). Human capital truly is the foundation of the company's tactic rebirth, innovation aptitude, creativeness, social and economic well-being, and subsequently sustains a key competitive plus (Sardo et al. 2018; Naslmosavi et al. 2013; Chi et al. 2016). Efficient

human capital can be a good solution to save a company from financial bankruptcy (Wang 2009), it can especially be the key to corporate growth in a financial crisis (Kehelwalatenna 2016). Hence, companies with higher human capital efficiency, due to their expertise and experience, can find suitable solutions to overcome problems in crises, and are less likely to take part in earnings management (Jamel and Mohsen 2017; Jaya et al. 2021). It is also worth noting that structural capital (SC) will play a constructive role in improving human capital efficiency (Ahangar 2011). If human capital plays a lesser role in creating value for companies, structural capital can be expected to help more value creation (Tan et al. 2007). Welly et al. (2021) argue that the value created by structural capital is never lost even as soon as employees leave the company, for staff knowledge has been embedded in a database so that the firm will not lose its value. SC includes all non-human capacities of an organization such as databases, charts, procedures, culture, technologies, inventions, and strategies that support employees' efforts to optimize corporate performances (Jaya et al. 2021; Bontis et al. 2000; Kehelwalatenna 2016). Hence, firms with higher structural capital efficiency are reluctant to manage profits, for good procedures within an organization can help achieve optimal company performance (Jaya et al. 2021). Eventually, a comparison between value-added and working physical capital is said to be capital employed efficiency (CEE). The capital employed concerns the friendly connection that the enterprise has with its partners, both from trustworthy and quality suppliers, loyal clients who are happy with the services of the firm concerned, and the company's correlation with the government and the surrounding community (Riahi-Belkaoui; Welly et al. 2021). From Pulic's (1998) point of view, when one unit of capital employed results in a greater return to an enterprise, we can expect that firm to make better use of physical and financial capital.

In line with confirming the above points about the potential of intellectual capital, the results of research in different markets have proved that intellectual capital and its components can create a competitive advantage and improve corporate financial performance (Chen et al. 2005; Yalama and Coskun 2007; Ting and Lean 2009; Mondal and Ghosh 2012; Yalama 2013; Sardo et al. 2018; Bontis et al. 2018; Ousama et al. 2019; Soewarno and Tjahjadi 2020; Neves and Proença 2021). Even some research studies conducted in the Iranian market have pointed out that the financial success of companies has been largely influenced by intellectual capital and each of its components (Namazi and Ebrahimi 2012; Mehralian et al. 2012; Amin et al. 2014; Nassari and Nasab 2014; Namazi and Arani 2014; Jafarnezhad and Tabari 2018). According to the existing research literature, weak corporate financial performance is recognized as one of the main reasons for earnings management (Khajavi et al. 2016; Zimon et al. 2021). Theoretically, firms revealing poor performance are expected to take part in accounting strategies, such as window dressing to portray a better picture of their earnings (Madhumathi and Ranganatham 2011; Khajavi et al. 2016), which is in line with poor earnings quality. Thus, if we look at the international different research in detail, we can find that since companies with more effective intellectual capital have better financial performance, they are less likely to engage in profit management activities and have less auditing risks (Sarea and Alansari 2016; Demartini and Trucco 2016; Jamel and Mohsen 2017; Mojtahedi 2018; Nuryaman and Arnan 2019; Jaya et al. 2021). In addition, several studies conducted in the Iranian market suggest that the better the intellectual capital and its components, the lower the risk of financial information manipulation among Iranian companies (Darabi et al. 2012; Darabi and Salmani 2012; Zanjirdar and Chogha 2012; Azizi et al. 2013; Galdipour et al. 2014; Khajavi et al. 2016; Mohammadzadeh 2020; Lotfi et al. 2021). As a result, on the one hand, since intellectual capital has been identified as an effective tool for improving the financial condition of a company, Iranian companies with appreciate intellectual capital are predicted not to participate in earnings management, resulting in reducing their audit risk.

Turning to the other side of the argument, sometimes companies not only may not use intellectual capital to gain a competitive advantage, but also use it more as a tool for doing profit management. Jaya et al. (2021) argue that there is always the possibility that management wants to use the capacity and potential of intellectual capital to manipulate

financial information and fraud in financial statements. It seems that given that there are many incentives for managers to manage profits in the Iranian market, further discussion in this study about the role of intellectual capital is doubly important. To conduct earnings manipulation, a firm with good human capital has to comprehend and be smart in observing the firm's macro condition or even the accounting strategies that will be employed for the financial statements' preparation (Jaya et al. 2021). Of course, human capital can use its expertise, knowledge, and experience to manipulate financial information to meet the expectations of investors and creditors when structural capital can support them well. Regarding the capital employed, it can be stressed that managers sometimes may use physical and financial capital to exit the economic crisis. For example, according to the matching principle, a company reports an expense on its income statement in the period in which the related revenues are earned. Managers' subjective estimates, such as the amount of bad debts that will not be paid the next year and the depreciation rate, are determinants of inaccurate evaluation of these assets (Lev and Gu 2016). Therefore, it is not too far from the mind that in Iran's sick economy, which has financial problems, managers engage in manipulating accounting figures using different accounting procedures to identify depreciation of assets. We also know that the substitution of fixed assets may occur when technological advancements cause machinery to become obsolete and, ultimately lead to a loss of demand for corporate products and services. Thus, Iranian directors may try to show lower depreciation rates by not showing the inefficiency of fixed assets. In other words, they can absorb the confidence of investors by reflecting better their net profits. In fact, by doing this, firms can prove that they have still the ability to compete with competitors in a financial crisis. Another important fact is that in an inflationary economy, such as Iran, in which prices are increasing day-by-day, Iranian managers are expected to show shorter maturity dates of their financial assets so that the liquidity of such assets is better shown in an inflation situation. Sometimes, Iranian companies also hire lawyers to cash their financial assets, such as accounts receivable, but they do not record such costs in their financial statements. In this regard, interesting research was done by Setayesh et al. (2013) in the Iran market and the results of their study show that there is a relationship between intellectual capital and profit management although it is not significant statistically. In general, based on what has been stated so far, managerial use of intellectual capital is like a double-edged sword. This means that if managers use it to gain a competitive advantage, it will lead to improving the financial performance of companies, which consequently improves the quality of financial reporting and reduces audit risk. However, when management uses it as a tool to distort financial statements, it will ultimately increase audit risk and audit fees. Building on the points made, the following hypotheses of the study are as follows:

Hypothesis 2 (H2). *There is a significant relationship between intellectual capital and audit fees.*

Hypothesis 3 (H3). *There is a significant relationship between human capital and audit fees.*

Hypothesis 4 (H4). *There is a significant relationship between structural capital and audit fees.*

Hypothesis 5 (H5). *There is a significant relationship between employed capital and audit fees.*

3. Research Methodology

Since the results of our study can be used in the decision-making process, this research is applied research. The statistical model in this study was a multivariate regression; the time range of the study was as long as six years (2011–2016). The total data needed to test the hypotheses in this study were collected directly from the financial statements on the Tehran Stock Exchange website. Moreover, the data on social capital were collected from the site of the Statistical Center of Iran. We used ten measures of norms and networks and conducted a principal component analysis (PCA) to construct an index for each county between 2011 and 2016, while the Pulic model was used to evaluate intellectual capital. In summary, the F-Limer test was used to test if a model estimation ought to have been

based on the ordinary least squares (OLS) or panel data technique. Then, the Hausman test was employed to identify whether panel data with fixed effects should be used or panel data with random effects. The white test was used to investigate heteroskedasticity problems, whereas the variance inflation factor (VIF) was used to examine the severity of multicollinearity.

3.1. Research Sample

The sample included all manufacturing companies listed on the Tehran Stock Exchange (TSE). Common features of the companies to determine the populations were as follow:

1. The type of the company activity should have been manufacturing; therefore, investment companies, leasing, credit institutions, and banks were not included in the sample because of their different natures. In the Tehran Stock Exchange, these companies have quite different natures in terms of reporting; thus, such companies cannot be examined (Moradi et al. 2021; Salehi et al. 2018a; Salehi et al. 2017).
2. According to the research period (2011–2016), the company needed to be listed on the TSE before the year 2011 and its name could not have been removed by the end of 2016.
3. The financial periods of companies should have been finished at the end of the solar year (March 20).
4. The companies should not have changed their fiscal year during the study period, and they should not have had more than six months of trading halts.
5. All required information about the financial statements and social capitals of each county must have been available.

In Table 1, information about the companies under review is provided based on various restrictions.

Table 1. Sampling method based on the above limitations.

Limitations	Firms
Listed companies on Tehran Stock Exchange by the end of March 2016.	517
Investment companies, leasing, credit, financial institutions, and banks.	(39)
Companies in which their fiscal year end was not in March (the end of Persian/solar year).	(98)
Companies that had more than six months of trading halt or that had changed the fiscal year during the period under study.	(147)
Companies whose information was not available or had been removed from the stock exchange.	(143)
The remaining firms in the sample.	90

The sample was limited to these years because the audit fee data on the TSE website were not available before 2011, and the social capital data were not available completely after 2016. Considering the above conditions, which have been used in many local studies (Moradi et al. 2021; Zimon et al. 2021; Salehi et al. 2018a; Salehi et al. 2018b; Tarighi et al. 2019; Tarighi et al. 2020; Moradi et al. 2020), a sample size of 90 TSE manufacturing firms as selected. Table 2 also provides information on how companies are distributed in different industries.

Table 2. Firm-year observations distributed across the industry sectors.

Industry Name	Firm-Year Observation	% of Sample
Agriculture and related services	12	2.22
Automotive and the manufacture of automotive parts	96	17.77
Basic metals	18	3.33
Cement, lime, and plaster	66	12.22
Chemical products	30	5.55
Computer-related facilities and services	6	1.11
Food and beverage products, except for sugar	54	10
Machinery and appliances	36	6.66
Other non-metallic mineral products	84	15.55
Pharmacy	60	11.11
Production of metal products	24	4.44
Rubber and plastic	24	4.44
textiles	12	2.22
Transportation, warehousing, and communications	18	3.33
Total	540	≈100

Our sample included 540 firm-year observations that represented 90 firms and 14 industries. The largest number of companies in the study sample was put in the automotive industry, while the lowest number belonged to the computer industry with 1.1%. All of these companies are located in the seventeen provinces of Iran. Table 3 shows information about the general status of the provinces in which companies operate.

Table 3. General information of the studied provinces.

Province	Area	Population	Percentage of Firms Deployed
Tehran	18,814 km^2	15.27 million	45.6%
Razavi Khorasan	118,851 km^2	5.994 million	5.6%
Qazvin	15,567 km^2	1.274 million	6.7%
Isfahan	107,029 km^2	5.121 million	7.8%
Qom	11,526 km^2	1.201 million	2.2%
Gilan	14,042 km^2	2.531 million	2.2%
Khuzestan	64,055 km^2	4.711 million	5.6%
Mazandaran	23,833 km^2	3.074 million	2.2%
East Azerbaijan	45,650 km^2	3.725 million	3.3%
Zanjan	21,773 km^2	1.016 million	2.2%
Markazi	29,127 km^2	1.429 million	4.4%
Yazd	129,285 km^2	1.139 million	1.1%
Ilam	20,133 km^2	557,599	3.3%
Lorestan	28,294 km^2	1.754 million	3.3%
Kermanshah	24,998 km^2	1.952 million	1.1%
Semnan	97,491 km^2	631,218	1.1%
Hamedan	19,368 km^2	1.758 million	2.2%

Turning to the details, it was found that, among the studied provinces, Tehran (capital city) is the most crowded city in Iran, whereas Ilam is the least populated, with 557,599 people. In terms of area, Yazd is ranked in first place, as opposed to Qom, which came at the bottom of the list with 11,526 km^2. Logically, when companies choose the locations of their headquarters, they attempt to consider cities that are in favorable positions, in terms of various economic, political, and social infrastructures that help companies grow in the market. It seems that the Iranian market is no exception. In fact, well under half of our study firms are headquartered in Tehran. As the capital of Iran, Tehran has special potential for further economic prosperity in terms of skilled labor, immigration patterns,

and the level of literacy of the community (Firoozi 1974). Tehran is not only identified as the pulsating cultural, economic, social capital of Iran, it is also it the political nerve center of Iran (Boroujerdi 2015). Since economic capacities and potentials in the Iranian capital are so high that almost a quarter of the country's GDP is allocated to Tehran, it is still the center of banking, commerce, and industrial activity in the country (Boroujerdi 2015). Consistent with our expectations, since Tehran is the capital of Iran, and is politically and commercially more privileged, most Iranian companies are interested in working in the capital to be at the center of investor attentions. In comparison with developed economies, as cities with such characteristics are found more in the capital in emerging countries, we sometimes see that the density of corporate headquarters is higher in the capitals. Of course, in developed markets, companies also pay a lot of attention to business strategic features related to the location of their companies' head offices. In this regard, Bel and Fageda (2008) examined European regions and found that when large companies want to choose the location of their headquarters, they care about important features such as the proximity to large markets and specialized providers, congestion, and tax costs, the availability of skilled labor, transport infrastructures, and tacit information exchanges between cities.

3.2. Research Model

3.2.1. The First Research Model

Inspired by the research model of Jha and Chen (2015) as well as Tarighi et al. (2019), we used multivariate regression to test our hypothesis, in which the dependent variable is the natural logarithm of the audit fees, and the independent variable is the social capital of the county where the firm is headquartered. In addition, the rest of the variables are defined as the control variables.

LN (AUDIT FEE) = B0 + B1 SOCIAL CAPITAL + B2 ROA+ B3 BIG1 + B4 LOSS + B5 FISCAL YEAR END + B6 TOBIN'S Q + B7 AUDIT TENURE + B8 FIRM SIZE + B9 FIRM AGE+ B10 DIVIDENDS + B11 DAYS TO SIGN + B12 UNQUALIFIED OPINION + B13 INHERENT RISK + B14 AUDITOR CHANGE + B15 SEGMENTS + B16 SPECIALIST+ B17 ANNUAL INFLATION+ B18 COST OF LIVING + B19 RURAL + B20 POPG + B21 LNPOP + B 22 GEOGRAPHICAL AREA + E. (MODEL 1)

Our study, without any exaggeration, seems to be among the most comprehensive and coherent forms of research that has ever been able to measure the various dimensions of social capital at the county level. There are three important reasons for this claim, which are quite reasonable and fair. First, social capital can be assessed using both direct and indirect techniques (Aghdaci and Mayeli 2018). Direct methods for evaluating social capital involve the use of norms and social networks, while the indirect approach can be the use of social deviations and determinants. According to Fukuyama's (2006) argument, social deviations have to be calculated in a different way to that for assessing social capital in societies that do not have the suitable data for measurements. In an indirect method, instead of measuring social capital as a positive value, in addition to social deviations, such as crime rates, such as robbery, family collapse, e.g., divorce rate, and other cases (Aghdaci and Mayeli 2018), the determinants of social capital, such as education, culture, and welfare can be measured. In general, as social capital reveals the presence of behavioral norms based on effort sharing, social deviations, and determinants would also be a real reflection of social capital (Fukuyama 1997). Hence, unlike all previous research that either used social networks and norms to measure social capital (direct method) or employed social deviations and determinants as an alternative measure (indirect method), this study, for the first time, has tried both direct and indirect methods simultaneously. Secondly, if we look closely at the prior literature in the field of social capital, we find that all of them, such as research by Alesina and La Alesina and La Ferrara (2000), Knack (2000), Guiso et al. (2004), Rupasingha and Goetz (2008), Putnam (2007), Deller and Deller (2010), Jha and Chen (2015), and Sánchez-Ballesta and Yagüe (2021), have used a small number of norms and networks to measure social capital. However, in this research, we used ten norms and networks or their alternatives for measuring social capital, which is by no

means comparable to previous studies in terms of number and quantity. These measures consist of trust, family value, culture, welfare, humanitarian participation, religion, sports, freedom of expression, science and education, and healthcare. Needless to say, when a challenging topic is analyzed from more angles, it can be better and more accurate to comment on the true quality of the subject. Thirdly, most of the past research used very few variables to measure a particular dimension of social capital, which may be considered a great weakness. Therefore, by increasing the number of variables in this paper, a better relative assurance can be obtained for evaluating each of the special aspects of social capital. The most important point we have to mention is that since the measures of the norms and the network are highly associated, similar to the studies by Rupasingha and Goetz (2008), and Jha and Chen (2015), we used a principal component analysis (PCA) to construct an index of social capital for each county. Our research approach to measuring social capital, in turn, is unique and can open a new window for future researchers so that they can best analyze all aspects of social capital at the same time. By conducting PCA, we first extracted the first component as a measure of evaluating each dimension of social capital. We then calculated the sum of the numbers obtained for all of the different dimensions together and used it as a measure of social capital at the county level. Finally, given the limited possibility of accessing social capital information in Iran, the following variables were selected to construct the measures for social capital assessment.

Trust: social capital consists of three core elements: trust, network, and reciprocity (Putnam 2000). Trust is the most important part of social capital facilitating communication and mutual understanding (Zhou and Kaplanidou 2018). Teramoto and Jurčys (2017) argued that the growth of trust between members of a society could significantly be effective in sharing ideas and improving cooperation. Six et al. (2015) also found that trust could have a vital role in the design and evolution of institutions for collective action. As a result, since the members' goals of society are achieved through these norms and mutual trust (Reza Asgari 2015), an improvement in mutual trust seems to be an important tool for reducing social violations and abnormalities. Building on this argument, mutual trust is one important aspect of social capital that should be highly paid attention to it. The research literature has shown that the development of ethical managerial behavior, as well as the reluctance to fraudulent financial reporting, can be rooted in improving the social trust environment (Berglund and Kang 2013; Chen et al. 2021). Given robbery indicates lower social trust (Aghdaci and Mayeli 2018), this paper uses these three parameters to measure trust: (1) theft of government buildings; (2) robbery of homes, shops, and industrial and commercial centers; (3) livestock robbery. Indeed, the greater the amount of theft in each province indicates that people have less trust in one another, thus reducing the level of social capital in the province.

Family stability: contemporary family life has become the focus of public concern and academic debate in recent years. The family is one of the most powerful forms of cognitive social capital (Arregle et al. 2007). Crosnoe (2004) believes that the family is the place where social capital is formed. If we want common interests to take precedence over personal interests, or if we wish to replace the desire for the public good with our good, and to have the ability to construct bonds of mutual trust, creating social capital, and supporting a society ruled by the principles of self-respect, it is necessary to learn to share and to become involved in collective tasks. The family provides an ideal galaxy for practicing this sort of learning (Rodríguez-Sedano et al. 2009). In Asian societies, such as Iran, families are the source of the emergence of social capital in the environment. Family values reinforce the integrity and solidarity of individuals and provide an ideal environment for the formation of beneficial cooperation among people and the emergence of social capital (Mehrabanpour et al. 2018). In the conceptualization of social capital, Coleman places families' center stage as a primordial organization; thus, it is argued that the breakdown of a family in itself constitutes a loss of social capital (Edwards et al. 2003). A lot of research has already pointed to the importance of the concept of family in shaping social capital (Sánchez-Famoso et al. 2013; Cano-Rubio et al. 2016; Amore 2017; Wang and Yu 2017). For example, Wang and Yu

(2017) realize that social capital can be improved by family. They believed that interactions among children from different families induce intergenerational feedback effects that are further amplified by interfamily interactions. The existence of the family is always a rich source of creating social capital that can help gain the fundamental values for moral and civic education (Rodríguez-Sedano et al. 2009). According to Putnam's (1993b) argument, since the family is connected with high levels of social trust and civic engagement, it can be interpreted that the quality of social capital (SC) decreases when family stability is destroyed. Rodríguez-Sedano et al. (2009) argue that if we assume that marriage is the main factor in creating social capital through the birth and upbringing of children, then family relations are a secondary network that multiplies and guarantees the human and physical capital in which the development of a society depends. In this research, to measure the family sustainability in each province, two ratios of "divorce to population" and "marriage to divorce" have been used. In other words, providing that the ratio of "divorce to the population" decreases and the ratio of "marriage to divorce" increases, the quality of coherence and consistency of families in society will improve, resulting in SC promotion.

Culture: culture can play an influential role in shaping social capital (Ferguson 2004), for cultural capital is demonstrated through behaviors (Pinxten and Lievens 2014). Culture is the collection of distinctive nonphysical, intellectual, emotional, and material structures of society, and cultural capital is the use of culture as capital (Hashemi et al. 2018). According to Pierre Bourdieu's theory, the extent, composition, and development of three forms of capital, which consists of social, economic, and cultural capital, determine an individual's position in society (Hashemi et al. 2018). With the use of culture as a power resource, it can be expected that people can take a social advantage that ultimately leads to the promotion of individual status in the community (Hashemi et al. 2018; Riaz et al. 2010; Kamphuis et al. 2015). Since culture can play a corrective role in erroneous behaviors, it is expected that the society has good cultural characteristics, social behaviors of people in the community will be more beneficial and healthier, which will improve the quality of social capital. In this paper, we have used various variables to measure the cultural dimension of people in each province: (1) the capacity of the country's cinemas; (2) the presence of spectators in cinemas; (3) the salon capacity for theatrical and musical performances; (4) the number of spectators who watch the theater and music; (5) the number of public libraries in the county; (6) the number of books in public libraries; (7) the number of book exhibitions in the county; (8) the number of visitors from book exhibitions; (9) the number of visitors from museums and monuments. Thus, the greater the cultural dimension of a society, the better the quality of social capital can be expected.

Welfare: over the last few decades, the concept of social welfare and its relationship with economic performance has attracted remarkable attention from economic experts and other social scholars. According to the prior economic literature, there is a significant relationship between economic growth and social capital (Calcagnini and Perugini 2019). In fact, if a government decides to increase the general livelihood and welfare of the society by controlling the inflation and unemployment rates, it has been able to take an effective step towards the development of social capital (Foley and Edwards 1999; Aghdaci and Mayeli 2018). There is no doubt in saying that improvement in the standard of living cannot only improve the awareness and insight of people in society but can also increase people's participation in social activities and, thus, promote empathy and social relations between them and strengthen social capital (Aghdaci and Mayeli 2018). For example, some researchers, such as Inglehart and Klingemann (2000) as well as Bjørnskov (2003), found that life satisfaction and social capital are closely intertwined. In addition, Calcagnini and Perugini (2019) realized that there is a connection between social capital and Italian economic improvement. Thus, the level of social welfare increases when the quality of social capital is improved. Since there is a causal relationship between social capital and welfare, it is logically argued that the higher level of social welfare reflects the higher level of social capital in society. In our study, to assess the social welfare dimension, four variables

have been used: (a) average annual net income per urban household; (b) average annual net expenditures per urban household; (c) average annual net income per rural household; (d) average annual net expenditures per a rural household. In this regard, it should be noted that, whenever the average annual net income of a rural or urban household increases, social capital increases. However, if the average annual net expenditure of a rural or urban household is increased, the result will be reversed.

Forgiveness and humanitarian spirit: research has shown that the high level of individual charitable decisions is rooted in high-quality social trust (Wang and Graddy 2008). Social trust determines a significant level of trust in the benevolent sector in a given society (Bekkers 2003). Accordingly, Kennelly et al. (2003) suggest social trust and membership in voluntary associations can be defined as two other measures of social capital. Participation in philanthropic activities is often perceived as a quality of a "good society" (Ayob 2020). Voluntary membership and participation of individuals in charitable activities is a symbol of a society in which the quality of social capital has grown to a desirable level (Kennelly et al. 2003). Hence, we argue that the number of humanitarian actions reflects the real quality of social capital. That is because people living in areas with more social trust are expected to donate more than others do. Exposure to giving opportunities and the willingness to give can affect individual charitable behavior strikingly; in addition, social trust can affect giving and forgiveness spirit in terms of psychological (Wang and Graddy 2008). To assess the forgiveness and humanitarian spirit of people in each province, various variables have been used in this paper: (1) popular donations in the form of alms; (2) people helping earthquake victims; (3) popular donations received from abroad; (4) the amount of money collected in the celebrations of charity; (5) the presence of honorary people in charity celebrations. Charitable giving is a part of civic life in Iranian society. Thousands of Iranians contribute annually to various charities and engage in humanitarian activities to make poor people happy, which reflects their great and kind hearts. In short, when people take part in humanitarian activities, the quality of SC will develop.

Religion: finer insights into social capital can be gained by different religious traditions, beliefs, and norms (Deller et al. 2018). Religion is an ethical occurrence that can be effective in dipping the agency's problem (McGuire et al. 2012; Tarighi et al. 2019). Accordingly, looking forward to past research, it can be seen that many scholars have used religious beliefs as a criterion for evaluating social capital (McGuire et al. 2012; Tarighi et al. 2019; Smidt and Smidt 2003; Jaggi and Xin 2014; Leventis et al. 2018; Harjoto and Rossi 2019). In this regard, Bloodgood et al. (2008) along with Walker et al. (2012) argue that religiosity can reduce cheating behavior, and spiritual people are keener on honest approaches. In financial literature, for example, Harjoto and Rossi (2019) showed that religiosity is positively connected with corporate social responsibility disclosure (CSRD). Leventis et al. (2018) also concluded that religious adherence reduces the need for shareholders to bear the costs of monitoring agents. Omer et al. (2018) indicated that audit practice offices located in highly religious regions are more likely to issue going-concern audit opinions as well. Furthermore, Jaggi and Xin (2014) supposed that the high-quality religious environment in which audit firms operate has a significant impact on their behavior, resulting in lower audit risk and lower audit effort and, hence, lower audit fees. Tarighi et al. (2019) also concluded that religiosity results in a decrease in audit costs and corporate tax avoidance in the Iran market. Similarly, Mehrabanpour et al. (2018) figure out social capital derived from religiosity has a negative impact on the audit fees of Iranian companies. To measure the quality of religious beliefs of individuals in each province, several variables that can express the quality of religious beliefs of individuals in Iran have been used in this research: (1) the number of pilgrims of Hajj Umrah, (2) the number of pilgrims of Hajj al-Tamattu, (3) the number of religious places (e.g., mosques); (4) the amount of Zakat collected in Eid al-Fitr; (5) the amount of atonement collected in Eid al-Fitr; (6) money and gifts collected at Eid Sa'id Qurban.

Sport: over the past few decades, the relationship between sport and social capital has become one of the most challenging research topics among various scientists (Gemar

2021). One main social influence of sports actions is the growth of social capital. Social capital is a multidimensional concept that contains social networks, social participation, and social trust (Macinko and Starfield 2001; Nieminen et al. 2013). The results of many studies have shown that physical activity can lead to more social participation and improve social capital (Lindstrom et al. 2003; Greiner et al. 2004). It is argued that the presence of sports events can bring ironic social profits to society including social vitality, civic pride, social sticking together, and community attachment (Zhou and Kaplanidou 2018; Inoue and Havard 2014). In this regard, Tonts (2005), as well as Skinner et al. (2008) believe that sports activities can be used as a mechanism to improve the quality of social capital in Australia. In South African, Heere et al. (2016) show that important sports events, such as the FIFA World Cup, may cause an improvement in social cohesion because individuals try to forget their ethnic differences. Taking primarily a Bourdieusian and neo-Bourdieusian theoretical approach, Gemar (2021) found a significant connection between key components of social capital and patterns of sports spectatorship and participation. In an interesting and new study, Zhou and Kaplanidou (2018) prove that when people take part in a sports event, the positive values of social capital, such as supportive attitude and behaviors, positive influence on others, prosocial behaviors, and increased everyday socialization, will be stronger. According to the previous research, when the sporting dimension of a community "invigorates", this means the quality of social capital will be better. In this paper, different variables have been used to assess the sporting dimension in each region of the country: (1) the number of sports referees; (2) the number of sports coaches; (3) the number of organized athletes; (4) the number of sporting venues.

Freedom of expression: freedom of expression is a sign of the quality of social capital. The reason is that based on the Universal Declaration of Human Rights. Freedom of expression is the right of every individual to hold opinions without meddling and to seek, receive, and impart information and thoughts through any media irrespective of frontiers (Graciyal and Viswam 2018). A society in which media freely operate and people have more freedom to express their thoughts is less corrupt (Jha and Sarangi 2017). Clearly, by having social media that can express one's thoughts and feelings, we can see the formation of subjective social norms that will surely improve the quality of social capital. In this regard, Ali et al. (2019) proved that social media bring about social capital' creation. Habes et al. (2021) also witnessed a positive relationship between the intensity of news personal sharing and social capital, bridging social capital, and self-esteem. In this paper, we believe that when people who live in society have more freedom of expression (social media), it can affect the level of SC. Therefore, various variables have been used to assess the freedom of expression dimension in each area of the country: (a) the number of titles of newspapers and periodicals; (b) the circulation of newspapers and periodicals; (c) number of titles of journals and quarterly; (d) the circulation of journals and quarterly; (e) the number of private printing houses.

Education: education is a strong and robust relationship involving individual social capital. Huang et al. (2009) suggested that the erosion of social participation during the past decades has coincided with a decrease in the marginal return to education on social capital. Imandoust (2011) proves that education can affect the quality of social capital in Iran country, too. Moreover, Arriaza and Rocha (2016) infer that social capital often develops in scientific and academic environments. Nateghpoor and Firuzabadi (2003) note that social cohesion in Iranian society is strongly influenced by education level. If we look at the results of other research studies conducted around the world, including Iran (Ashrafi et al. 2012; Baheiraei et al. 2018), Sweden (Behtoui 2007), the Netherlands (Van Tubergen and Volker 2015), Switzerland (Bonoli and Turtschi 2015), and England (Tholen et al. 2013), we find that the higher the level of education among individuals in a community, the better the participation in social networks. Furthermore, based on documents obtained from the United States (Brehm and Rahn 1997), Finland (Nieminen et al. 2008), Greece (Kostas and Roumeliotou 2009), and even Iran (Ashrafi et al. 2012), it can be stated that higher education can be a great determinant of social inclusion dimensions. Looking at the

research literature from around the world, science and education are believed to play key roles in the formation of social capital. In short, when the level of science and education in society improves, society has more suitable social capital. To investigate the educational dimension of each province, various variables have been used, as follows: (1) the number of preschools; (2) the number of people who are preschoolers; (3) the number of primary schools; (4) the number of elementary school students; (5) the number of secondary schools; (6) the number of secondary school students; (7) the number of high schools; (8) the number of high school students; (9) the number of universities; (10) the number of university students.

Healthcare: various studies have implicitly shown that people with the right level of health are living in a society where their quality of social capital is relatively good. Strong evidence has proved that social capital improves health situations through several mechanisms: norms and attitudes that affect health behaviors, psychosocial networks that rise access to health care, and psychosocial tools that develop self-esteem (Kawachi et al. 1999; Kawachi and Berkman 2000; Lindström 2008; Nieminen et al. 2013). For instance, Nieminen et al. (2013) saw a significant connection between different dimensions of social capital and health. Further, Zhong et al. (2017) showed that low social capital was associated with low health-related quality of life among persons. Derose and Varda (2009) also believe that social capital is significantly linked to health care access as well. Similarly, Eriksson (2011) argues that social capital and health are positively connected. In a relatively comprehensive study, Ehsan et al. (2019) reviewed a lot of studies and concluded that the state of health and the quality of social capital move in the same direction. Consequently, according to the above literature, it seems that as long as the level of individual and collective health in the community is high, social capital is on the path to progress. In this study, various parameters have been used to measure the healthcare aspect of each county: (1) the number of health centers; (2) the number of laboratories; (3) the number of pharmacies; (4) the number of rehabilitation centers; (5) the number of doctors; (6) the number of paramedics; and (7) life expectancy.

Regarding the rest of the control variables, ROA is the ratio of net income to total assets (Jha and Chen 2015; Salehi et al. 2018a; Salehi et al. 2018b; Tarighi et al. 2019; Tarighi et al. 2020; Moradi et al. 2020; Salehi et al. 2020b). LOSS is an indicator variable that equals one if the ROA is negative and zero otherwise (Jha and Chen 2015; Salehi et al. 2018a; Tarighi et al. 2019; Tarighi et al. 2020; Salehi et al. 2020b; Salehi et al. 2019b). Various studies have shown that the variables of ROA and loss are significantly connected with audit costs (Musah 2017; Salehi et al. 2018a); companies that have better financial performance (ROA), are not "loss-making", and that are less likely to be involved in financial fraud, to portray a better picture of their economic situations in the market. The research literature has noted that dividends decrease audit risk by improving the quality information of customer earnings; as a result, audit firms consider the earnings quality information content of the dividend policies of firms as the main factor in their pricing decisions (Lawson and Wang 2016). Thus, we define DIVIDENDS as another control variable in this study. DIVIDENDS are the payments a corporation makes to its shareholders as a return on the company's profits (Tarighi et al. 2019; Salehi et al. 2020b). The DAYS TO SIGN variable, as a measure of the auditor's effort, is the lag between the signature date of the audit opinion and the date of fiscal year-end (Jha and Chen 2015; Tarighi et al. 2019, 2020; Salehi et al. 2020b). If this variable is higher than the average, it means a delay in the audit reporting and is equal to one, and zero otherwise. Moreover, the audit risk is low, and the audit fee is less when an independent auditor's judgment is that a company's financial statements are fairly and appropriately presented (Jha and Chen 2015). Accordingly, UNQUALIFIED OPINION is defined as an indicator variable in this research and equals one if the auditor issues an unqualified opinion without any additional language and zero otherwise (Jha and Chen 2015; Tarighi et al. 2019; Salehi et al. 2020b; Landsman et al. 2009). Moreover, audit fees and the number of audit hours are predicted to increase when business risk goes up (Bell et al. 2001). Hence, INHERENT RISK as a control variable in this paper is the sum

of receivables and inventory scaled by assets (Jha and Chen 2015; Tarighi et al. 2019). When an enterprise changes its independent auditor, it should firstly experience lower audit costs since non-incumbent auditors discount the initial audit engagement to get the right to future quasi-rents of audit fees (DeAngelo 1981; Scott and Gist 2013). Consequently, we examined if new auditors are willing to receive lower fees at the beginning of their working relationships with their clients. AUDITOR CHANGE is an indicator variable and equals one if the auditor has changed in the fiscal year and zero otherwise (Jha and Chen 2015; Tarighi et al. 2019).

It should also be noted that larger audit firms, using their vast knowledge and experience, do their utmost to detect possible financial fraud so that their professional reputation and credibility are not tarnished against the public, which is why premiums earned by large audit firms are more than small ones (Francis 1984; Ireland and Lennox 2002; Pham et al. 2017). Bigger audit firms are predicted to deter client earning management behavior owing to litigations against well-known auditors that can harm their reputations, by showing a negative signal about the quality of the audit services (Hadriche 2015; Salehi et al. 2018c). Thus, BIG1 as an indicator variable equals one if the auditor is a member of the auditing organization in Iran and zero otherwise (Salehi et al. 2018a, 2018c; Tarighi et al. 2019, 2020; Moradi et al. 2020). Since various research results so far have shown that the relationship between auditor specialization and the audit fees are charged by them can be positive (Ward et al. 1994), negative (Chase 1999), and sometimes meaningless (Lowensohn et al. 2007), we were also keen on if audit fees varied systematically with auditor specialization, in an Iranian context. Therefore, the SPECIALIST variable is an indicator variable, and it is equal to one if the ratio of the total fees collected by the auditor for the industry, to the total fees collected, is the highest, and zero otherwise (Jha and Chen 2015; Tarighi et al. 2019; Fung et al. 2012).

It is worth mentioning that, not only managers in the company's head offices have an impact on the quality of financial reporting, but also employees working in other geographical areas of the company play an important role in improving the quality of the company's accounting information systems (Jha and Chen 2015). For this reason, we control for this effect by adding the number of geographic segments as a control variable to our model. SEGMENTS is the square root of the number of geographic segments (Jha and Chen 2015; Tarighi et al. 2019). As severe economic sanctions have caused prices to rise steadily in the Iranian market, we want to know whether audit fees received by auditors have been affected by inflation. The INFLATION variable represents the annual inflation rate, which is published by the Central Bank of the Islamic Republic of Iran (Moradi et al. 2021). Since higher audit fees are expected to be charged by auditors where the cost of living index is higher (Jha and Chen 2015), we attempted to examine its effect by including this control variable in the first research model. The COST OF LIVING variable measures the cost of living index of a county for each year (Jha and Chen 2015; Tarighi et al. 2019). In the following, this paper controls for other related county-level characteristics, including the population density (RURAL), the population growth (POPG), and the amount of geographical area in each province (GEOGRAPHICAL AREA). RURAL is an indicator variable that is equal to one if the county's population density is less than the median, and zero otherwise. It is worth keeping in mind that the population density is the ratio of the population to the land region (Jha and Chen 2015; Tarighi et al. 2019). The POPG variable is defined as the percentage of the population growth of the province from the prior year; moreover, LN POP is the natural log of the province's population. Finally, the GEOGRAPHICAL AREA shows the information about the "amount" of the geographical area in each province (Jha and Chen 2015; Tarighi et al. 2019).

3.2.2. The Second and Third Research Models

The first goal of this research was to investigate the association between intellectual capital and audit fees among Iranian firms listed on the TSE. In the second research model, we wanted to know if there was a significant relationship between each component

of intellectual capital and audit costs. Statistically, in a regression model, independent variables must not be strongly correlated. It is noteworthy that the strong correlation between the independent variables causes the determinant size of the matrix of independent variables to approach zero, which deprives us of the correct calculation of parameters of a regression model (Zimon et al. 2021). Since the VAIC consists of the sum of three variables of HCE, SCE, and CEE, it cannot be placed next to other independent variables, because it will create the collinearity issue in a regression model. Hence, to avoid the collinearity problem, the components of intellectual capital, namely HCE, SCE, and CEE, are regarded separately in the second model.

LN (AUDIT FEE) = β0 + β1 Intellectual capital (VAIC) + β2 Tobin's Q + β3 BM + β4 Sales Growth + β5 Current Ratio + β6 LEVERAGE + β7 FIRM SIZE + β8 FIRM AGE + β9 Managerial Overconfidence + β10 RPTs + β11 Institutional Owner+ β12 ICW + β13 BIG1 + Industry Indicator + Year Indicator ε. (Model 2)

LN (AUDIT FEE) = β0 + β1HCE + β2SCE + β3CEE + β4 Tobin's Q + β5 BM + β6 Sales Growth + β7 Current Ratio + β8 LEVERAGE + β9 FIRM SIZE + β10 FIRM AGE + β11 Managerial Overconfidence + β12 RPTs + β13 Institutional Owner+ β14 ICW + β15 BIG1 + Industry Indicator + Year Indicator + ε. (Model 3)

where the natural logarithm of the audit fees charged by the external auditor is defined as a dependent variable. Value added intellectual capital (VAIC) in the second model, and three components of the intellectual capital, namely HCE, SCE, and CEE in the third model, are considered as independent variables. As for intellectual capital, because of the increased understanding of managers about the benefits of intangible assets in an organization, several methods have been developed to measure intellectual capital. Pulic presented the value added intellectual capital (VAIC) for the first time in 1997, developed it in 1998, and finally completed it in 2000 (Jaya et al. 2021; Jafarnezhad and Tabari 2018). The value added intellectual capital (VAIC) can be easily calculated because intellectual capital is indirectly measured by capital employed efficiency (CEE), human capital efficiency (HCE), and structural capital efficiency (SCE). The Pulic model has five steps, as follows (Pulic 1998; Jaya et al. 2021; Chouaibi and Chouaibi 2020):

Step (1): according to the company's stakeholder view, the value added (VA) is equal to the following formula:

$$VA = OUTPUT - INPUT$$

where OUTPUT: the entire income from the sale of goods and services. INPUT: the total cost of materials, components, and services purchased. In this model, salary costs are not incorporated in the entrance owing to the active role of human resources in the process of creating value. Consequently, the cost of workforces is not considered as a cost, but it is considered as an investment. The value-added can be calculated using the information in the annual reports as follows

$$VA = OP + EC + D + A$$

where, OP: operating profit EC: employees cost D: depreciation, A: depreciation of intangible assets.

Step (2): determination of capital employed efficiency (CEE): for a clear picture of the efficiency of resource-creating resources, it is necessary to consider the efficiency of physical capital as well as financial capital, which is achieved through this relationship.

CEE = VA/CE. CE: capital employed is equal to the book value of total assets minus that intangible asset.

Step (3): determining human capital efficiency (HCE): according to this model, the total staff costs are considered human capital.

$$HCE = VA/HC$$

HC: human capital is equal to the total salary cost of the company.

Step (4): calculation of structural capital efficiency (SCE): this ratio shows the portion of structural capital in generating the value that can be attained from the following equation:

$$SCE = SC/VA$$

SC: structural capital of the firm, which is calculated as follows.

$$SC = VA - HC$$

Step (5): calculation of value added intellectual coefficient (VAIC): in the last phase, VAIC is equal to the sum of the efficiency of the three types of previously mentioned capital.

$$VAIC = CEE + HCE + SCE$$

Regarding control variables, to better understand the relationship between companies' financial performances and the level of quality of their financial information, both accounting-based (book-to-market ratio) and market-based (Tobin's Q) measures were used as control variables in this study. Tobin's Q is the ratio of the market value of a company's assets (Zimon et al. 2021; Khanifah et al. 2020). The BM variable equals the ratio of the book value to the market value of ordinary equity holders (Salehi et al. 2018b, 2019b). Sales growth is defined as another control variable to analyze if firms try to maintain the quality of their financial reports so as not to damage their professional reputations in the market when they have high sales and customer loyalty. Sales growth is the rate of change in sales from the previous year to the current year (Yazdanfar and Öhman 2015; Moradi et al. 2021; Zimon et al. 2021). Furthermore, the current ratio, as another control variable, tells us how much a company can repay short-term debt (Salehi et al. 2018a). The closer this ratio is to number one, the better its ability to repay its debts (Zimon et al. 2021). The debt interest rate is fixed regardless of the rate of return on the company's assets. In a favorable economic environment, financial leverage can play a major role in maximizing shareholder wealth. In the same vein, many studies confirm the positive impact of financial leverage on corporate business success (Taqi et al. 2020), while some research has shown that it can be a deadly factor for companies (Alarussi and Alhaderi 2018; Appiah et al. 2020). For this reason, since most Iranian companies are under severe financial pressure due to financial problems caused by economic sanctions, the importance of evaluating the role of financial leverage as a control variable in this study is prominent. LEVERAGE is calculated through long-term debt scaled by total assets (Salehi et al. 2018a, 2019b; Zimon et al. 2021). In this study, the FIRM SIZE variable is defined as the natural logarithm of total assets of a firm (Moradi et al. 2021; Zimon et al. 2021; Raguseo et al. 2020). The more reliable the sources of information and the greater the number of assets and financial resources, the more likely companies are to succeed in today's competitive and complex market (Alarussi and Alhaderi 2018); as a result, compared to small firms, larger companies can experience more business success in the market by having such unique features (Zimon et al. 2021). The main purpose of considering a firm size as a control variable is to examine if larger companies that have higher competitiveness in the market want to mislead stakeholders and distort financial statements. Moreover, FIRM AGE is the number of years of company activity (Moradi et al. 2021; Zimon et al. 2021; Sarlak and Akbari 2014; Fan and Wang 2019). The theory of learning by doing explains the positive connection between firm age and corporate victory, as when the age of a firm increases, there is the likelihood of improvement in its productive proficiency over time by learning from experience, while the negative association can be viewed from the viewpoint of liability of obsolescence in which organizational performance drops with age (Ilaboya and Ohiokha 2016; Zimon et al. 2021; Tarighi et al. 2022).

Another important point is that overconfident executives want to overestimate their ability and the future payouts of projects but undervalue the possibility and impact of adverse events. When auditors view overconfident managers as a risk factor for fraudulent financial reporting, if they are to take responsibility for auditing such companies, they

will charge additional fees to compensate for the increased auditing effort, because they perceive managerial overconfidence as increasing audit risk (Duellman et al. 2015). On the other hand, audit fees for companies with overconfident managers will be lower if managers demand fewer audit services due to either hubris in the company's financial reporting or a tendency to decrease auditor scrutiny over aggressive accounting practices (Duellman et al. 2015; Sepasi and Vasfi 2016). As a result, some studies have shown a positive relationship between managerial overconfidence and audit fees (He et al. 2020), while others have found a negative linkage between them (Duellman et al. 2015; Hasas Yeganeh et al. 2015; Sepasi and Vasfi 2016). This study analyzes what kind of relationship there is between managerial overconfidence and audit fees in the Iranian context. Hence, managerial overconfidence as an indicator variable equals one if the capital expenditures deflated by total assets at the beginning of the period is greater than its median level for the relevant industry in that year, otherwise zero (Salehi et al. 2020a). As for related party transactions (RPT), "propping" or "efficient transaction hypothesis" indicates RPTs can meet the economic needs of a company and contribute to corporate economic development (Zimon et al. 2021). Gordon and Henry (2005) argue that when the main purpose of making a transaction with related parties is to gain access to their experience, expertise, and unique skills, managers no longer have a particular incentive to manipulate financial information, which in turn will reduce audit costs. To prove this claim, several studies have stated that there is a positive association between RPTs and financial reporting quality (El-Helaly et al. 2018; Alhadab et al. 2020). Nevertheless, "tunneling" or "conflict of interests transaction hypothesis" states that RPTs may lead to corporate failure because they exploit company resources due to existing conflictual interests (Pozzoli and Venuti 2014; Hendratama and Barokah 2020; Zimon et al. 2021). Once enterprise management decides to take part in RPTs to expropriate corporate resources, then they have motivations for distorting earnings, either to justify or increase these perquisites or possibly to mask such expropriation (Gordon and Henry 2005; Marchini et al. 2018; Zimon et al. 2021). The findings of some researchers testify to the fact that companies use RPTs as a tool to manage profits (Healy and Wahlen 1999; Thomas et al. 2004; Djankov et al. 2008; Zimon et al. 2021; Subastian et al. 2021), which can significantly affect audit fees. In this study, RPT as a control variable is calculated as the sum of the disclosed related-party transaction prices, such as RPT-purchase, RPT-sale, and RPT-loan, in notes, to the annual financial statements divided by beginning assets of the firms (Sarlak and Akbari 2014; Zimon et al. 2021).

It is important to note that there are many institutional investors at the main core of most Iranian company ownerships and, most importantly, institutional owners mainly consist of state-owned and quasi-governmental organizations (Moradi et al. 2012). Hence, the power and influence of the Iranian government play significant roles in making major business and operational decisions of companies (Zimon et al. 2021). Given institutional ownership is one of the corporate governance mechanisms controlling an agency's problems and that it improves the protection of the interests of investors (Shleifer and Vishny 1997; Zimon et al. 2021), our research tends to examine if institutional ownership is an obstacle to mislead stakeholders and can reduce audit risk and fee. Further, because internal information systems within companies generate corporate accounting information (Huang 2016), the higher the quality of internal control systems, the lower the risk of financial fraud (Doyle et al. 2007; Ashbaugh-Skaife et al. 2008). Given that a weak internal control system may lead to conditions resulting in opportunistic managerial behavior and, consequently, increased audit fees (Järvinen and Myllymäki 2016), we consider internal control weakness (ICW) as a control variable in this study.

4. Results

4.1. Descriptive Statistics

To analyze the data, the descriptive statistics, including minimum, maximum, mean, median, and standard deviations, are calculated and presented in Tables 4 and 5.

Given the average annual inflation rate, which is almost more than 20%, we can say that Iranian companies have been facing severe financial problems due to severe economic sanctions in recent years. Since the sample companies have been operating in the market for an average of 16 years, it can be understood that they have enough experience to deal with difficult financial conditions, even though the ratio of ROA and Tobin's Q confirm that they have not performed well financially. The companies' sales have increased by an average of 10% compared to the previous year, which is another sign of the unfavorable economic trend of companies during the crisis, too. If we also look at the average financial leverage, we find that Iranian companies have a relatively high business risk because more than two-thirds of their assets are secured from borrowing. Since on average a large part of the ownership structure of Iranian companies is surrounded by institutional investors in the Iranian market, it can be concluded that the government has a key role in the macroeconomic decisions of companies. Our outcomes also show the highest amount of audit fees is 9.3026460, while the lowest is 4.2484952, indicating the difference between the audit fees received by the auditors in Iran is very high. Furthermore, the average working relationship between an auditor and a client in Iran is over four years—this long period can help the auditors remarkably reduce their audit risks by gaining sufficient knowledge of the client's business environment. The results of descriptive statistics also show that, on average, human capital has been more efficient among the various components of intellectual capital. Finally, it can be said that the number of observations of the variables related to companies is 540, because 90 firms have been examined over a period of six years. Furthermore, the number of observations of the variables related to county-level characteristics is 102 because they include a six-year study period for the 17 provinces where the companies reside. Because information about the annual inflation rate for each province is not separately available in the Iranian market, the annual inflation rate in the whole country for a period of six years has been examined in this study.

Table 4. Descriptive statistics of quantitative variables.

Variable	OBV	Mean	S. Deviation	Max	Min
AUDIT FEE	540	6.4316501	0.8904636	9.3026460	4.2484952
AUDIT TENURE	540	4.2722222	2.5060163	7	1
FIRM SIZE	540	12.9319209	1.5838034	18.5218625	8.2168986
FIRM AGE	540	16.1500000	7.2024591	47	5
DIVIDENDS	540	0.0170182	0.1207042	2.5645244	0
TOBIN'S Q	540	5.9779101	0.5564383	7.674608	3.794682
ROA	540	0.0946210	0.1649660	0.7458920	−1.3226566
BM	540	0.5693697	1.5014635	15.233412	−10.579730
SALE GROWTH	540	0.1083455	0.1952241	0.6579490	−0.8120511
CURRENT	540	1.0840291	3.1813477	96.215645	0.0411231
LEVERAGE	540	0.7045991	0.3454187	3.060401	0.145188
INSTITUTIONAL	540	0.6238464	0.1994536	0.984	0
RPTs	540	0.7113519	1.3128804	15.101203	−0.0681325
INHERENT RISK	540	1.2192879	2.3571234	29.1420470	0
ANNUAL INFLATION	6	20.91667	9.001841	34.70	10.80
COST OF LIVING	102	4,328,813.00	1,142,045.63	5,683,884.00	2,532,774.00
LN POP	102	18.1429191	0.0230133	18.1773718	18.1103394
POPG	102	0.1126667	0.0457905	0.1420000	0.0120000
SEGMENTS	102	13.3052407	2.6790048	18	5
GEOGRAPHICAL AREA	102	28,121.29	28,580.44	130,458.00	5570.00
SOCIAL CAPITAL	102	402.327255	30.590067	457.3	337.05
VAIC	540	9.9577342	51.623893	630.974632	−406.545189
HCE	540	8.7296429	51.541631	621.617729	−407.093672
SCE	540	0.5373686	0.9935277	8.533496	−7.127863
CEE	540	0.6907926	1.1541635	10.922802	−1.135826

Table 5. Descriptive statistics of qualitative variables.

Variable	Status	Description	Frequency	%
AUDITOR CHANGE	1	If the auditor changed at the fiscal year end	84	0.16
	0	If the auditor did not change at the fiscal year end	456	0.84
LOSS	1	If the ROA is negative	295	0.55
	0	If the ROA is positive	245	0.45
BIG1	1	If a firm is audited by the auditing organization	135	0.25
	0	If a firm is not audited by the auditing organization	405	0.75
DAYS TO SIGN	1	If there is a delay in the audit report	291	0.54
	0	If there is no delay in the audit report	249	0.46
UNQUALIFIED	1	If the auditor issues an unqualified opinion	233	0.43
OPINION	0	If the auditor does not issue an unqualified opinion	307	0.57
SPECIALIST	1	If the auditor is an industry specialist	231	0.43
	0	If the auditor is not an industry specialist	309	0.57
RURAL	1	If the population density is less than the median	364	0.67
	0	If the population density is not less than the median	176	0.33
OVERCONFIDENCE	1	If a firm has overconfident management	292	0.54
	0	If a firm does not have overconfident management	248	0.46
ICW	1	If there is a material weakness in internal control	281	0.52
	0	If there is no material weakness in internal control	259	0.48

Another interesting point is that the highest value of the social capital index in Iran is 457 and its lowest is 337. Despite the very high inflation rate in Iranian society, which has even reached 35%, one should not expect the growth of social capital in different parts of the country to be higher than this. The existence of a high inflation rate in the society due to severe economic sanctions has made Iran's country unable to move properly in the direction of development and the class gap between the people is increasing every day. When the class gap between the people of the society is large and the living conditions of the people are deteriorating, one can expect that social participation and public satisfaction not only will decrease sharply but also the people's trust in the government will be lost, resulting in a decline in the social capital quality (Aghdaci and Mayeli 2018). In general, given that the rate of severe inflation has pervaded the entire Iranian society, there is public dissatisfaction with the government and their non-participation in social activities throughout the country.

As for descriptive statistics of qualitative variables, we can say that half of the Iranian companies have suffered losses. However, more than half of the managers of Iranian companies seem to have high self-confidence and are too optimistic about their ability and the future payouts of projects but underestimate the possibility of unexpected financial events. Approximately 52% of Iranian companies have a material weakness in their internal control system, which can damage the quality of their financial reporting. In addition, by reviewing the values of the two variables of days to sign, and unqualified opinion, it is interpreted that the audit risk of Iranian companies is relatively high. In other words, more

than half of the audit firms not only had significant delays in providing the audit report, but also they did not issue an unqualified audit report, both of which indicate the high risk of auditing Iranian companies. Outputs also show that exactly a quarter of Iranian companies are audited by the auditing organization, while non-famous auditors audit three-quarters of them. Finally, the rural variable demonstrates more than two-thirds of the study areas are less densely populated.

4.2. Conclusive Statistics

Panel data point to a dataset, based on which observations surveyed by many sectional variables are often selected randomly during a given period. As the panel data comprise both aspects of time series data and sectional ones, employing appropriate statistical explanatory models that describe the specifications of the variables is more difficult than the models used in sectional and time-series data (Zimon et al. 2021; Salehi et al. 2018a; Tarighi et al. 2019; Zimon and Tarighi 2021).

4.3. F-Limer and Hausman Tests

In accounting studies, when data are collected for several firms over a particular period, we have longitudinal data (pooled or panel). Therefore, when data are longitudinal, the type of assessment of a model has to be determined at first. Based on the principles of econometrics, it is necessary first to use the F-Limer (Chow) test to examine if the research model should be estimated based on the ordinary least squares (OLS) or panel data method (Moradi et al. 2021; Zimon et al. 2021; Tarighi et al. 2019; Moradi et al. 2020; Zimon et al. 2021; Zimon and Tarighi 2021; Salehi et al. 2019c). According to the Chow test, the null hypothesis (H0) suggests that there is no difference between the estimated coefficients for individual cross-section and the estimated coefficient for individual mass, implying there is no necessity to estimate the model by using the panel data (Salehi et al. 2020a; Moradi et al. 2021; Zimon and Tarighi 2021; Tarighi et al. 2022). Overall, the results of the F-Limer test in this paper show that, as the *p*-value of its H0 is less than 0.05 for all models, the OLS method is used. However, when the use of the panel data method is confirmed, the Hausman test is used to determine whether panel data with fixed effects should be used or panel data with random effects. In short, as the results of the F-Limer test in this research confirm that all research models are well-suited with OLS regression, it can be concluded that there is no longer any need for a Hausman test (Salehi et al. 2018a, 2019c; Zimon and Tarighi 2021).

4.4. Heteroskedasticity and Multicollinearity Tests

The lack of a heteroskedasticity problem has been often identified as one of the main assumptions of a regression model (Zimon and Tarighi 2021). According to this assumption, if any desired part of model errors is selected and the variance of that part is calculated, there will be no significant difference with the variance of other desired parts. It is clear that when there is a heteroskedasticity problem, coefficients of a regression model, although non-bias, do not have minimum variance features, and this can lead to incorrect inferences concerning rejecting or not rejecting research hypotheses (Moradi et al. 2020). If there are homoscedastic disturbances when heteroskedasticity is present, this will yield consistent estimation results of coefficients that are not effective (Zimon and Tarighi 2021; De Jager 2008). The white test can be used to investigate heteroskedasticity problems (Moradi et al. 2020; Ando and Hodoshima 2007). Generally, the results of the white test in this research demonstrate that there are no heteroskedasticity issues regarding all models because the amount of the *p*-value in this test is greater than 5%. In addition, to examine the severity of multicollinearity in a regression analysis, the variance inflation factor (VIF) can be employed (Zimon and Tarighi 2021). The VIF index analyzes how much the variance of an estimated regression coefficient is augmented as a result of collinearity (Tarighi et al. 2022). In general, the problem of linearity cannot be imagined if the VIF of the estimated model coefficients is less than ten (Salehi et al. 2018a; Zimon and Tarighi 2021; Thompson et al.

2017; Kim 2019). As our findings indicate that the value of our independent variable is less than five, we can conclude that there is no linearity concerning the research hypotheses.

4.5. Unit Root Test

In statistics, a unit root test scans for whether a time series variable is non-stationary and possesses a unit root. The null hypothesis is usually regarded as the presence of a unit root and the alternative hypothesis is stationary (Moradi et al. 2021; Zimon et al. 2021; Tarighi et al. 2022). Overall, as augmented Dickey–Fuller (ADF) and Phillips–Perron (PP) have constantly been among the most prevalent unit root tests, both of them are used in Table 6.

Table 6. The results of the unit root test.

Variable	Augmented Dickey–Fuller (ADF)		Phillips–Perron (PP)	
	Statistic	*p*-Value	Statistic	*p*-Value
AUDIT FEE	183.667	0.0021 ***	306.797	0.0000 ***
AUDIT TENURE	56.0389	0.0035 ***	89.7146	0.0007 ***
FIRM SIZE	153.354	0.0181 **	267.262	0.0342 *
FIRM AGE	2.12698	0.0495 *	4.01519	0.0414 *
DIVIDENDS	60.4489	0.0003 ***	90.6653	0.0009 ***
TOBIN'S Q	143.376	0.0002 ***	259.170	0.0004 ***
ROA	140.926	0.0172 **	238.863	0.0018 ***
BM	293.913	0.0000 ***	515.836	0.0000 *
SALE GROWTH	397.498	0.0006 ***	486.137	0.0054 ***
CURRENT	293.994	0.0231 *	341.057	0.0183 **
LEVERAGE	193.479	0.0171 **	346.599	0.0041 ***
INSTITUTIONAL	242.014	0.0000 ***	284.943	0.0002 ***
RPTs	325.012	0.0008 ***	411.003	0.0006 ***
INHERENT RISK	103.082	0.0000 ***	168.713	0.0001 ***
ANNUAL INFLATION	11.5405	0.0496 *	12.0194	0.0364 *
VAIC	249.309	0.0007 ***	407.969	0.0000 ***
HCE	251.439	0.0005 ***	393.941	0.0000 ***
SCE	217.644	0.0365 *	381.081	0.0000 ***
CEE	144.310	0.0091 ***	233.122	0.0063 ***
BIG1	19.1471	0.0005 ***	32.5533	0.0000 ***
AUDITOR CHANGE	127.607	0.0407 *	228.601	0.0000 ***
UNQUALIFIED	53.3483	0.0007 ***	93.7226	0.0041 ***
DAYS TO SIGN	144.579	0.0000 ***	253.829	0.0295*
ICW	12.0130	0.0029 ***	14.1507	0.0008 ***
SPECIALIST	24.1356	0.0149 **	42.1819	0.0065 ***
LOSS	86.0856	0.0000 ***	135.189	0.0009 ***
OVERCONFIDENCE	116.294	0.0058 ***	184.008	0.0003 ***
RURAL	11.0034	0.0001 ***	14.5019	0.0000 ***
COST OF LIVING	28.0341	0.0394 *	51.3519	0.0001 ***
LN POP	38.0064	0.0000 ***	61.1137	0.0075 ***
POPG	13.0163	0.0005 ***	17.0082	0.0000 ***
SEGMENTS	27.3960	0.0495 *	39.0575	0.0029 ***
GEOGRAPHICAL AREA	84.9918	0.0000 ***	53.0527	0.0003 ***
SOCIAL CAPITAL	118.035	0.0051 ***	163.0542	0.0001 ***

Confidence level (**): 98% confidence level (*): 95% confidence level: 99% (***).

Since the amount of the *p*-value for all variables is less than 0.05%, we can conclude that our research variables are stationary, meaning efficient regression and very accurate results. To put it another way, our results confirm that the variables of our study are real and stationary, and they can be used in OLS regression with high reliability.

4.6. The Results of Principal Component Analysis (PCA)

As already mentioned, the social capital index has been calculated through ten different criteria—of norms and social networks or their substitute factors—for the years 2011 to 2016,

each of which reflects a critical issue in this field. Drawing on the existing research literature, there are two important strategies for evaluating social capital, including direct and indirect methods (Aghdaci and Mayeli 2018). To the best of our knowledge, some scholars, such as Fukuyama (2006) and Aghdaci and Mayeli (2018), argue that indirect influencing factors can be used as a measure of social capital. The logic behind this argument is based on the fact that social deviations, such as theft and divorce rates, and other factors, can create false and destructive patterns in society and reduce the value of social capital, while appropriate infrastructure in the fields of education, culture, healthcare, welfare, and sports can increase the quality of social capital. On the other hand, some of the leading past studies, such as by Alesina and La Ferrara (2000), Knack (2000), Guiso et al. (2004), Rupasingha and Goetz (2008), Putnam (2007), Deller and Deller (2010), Jha and Chen (2015), Tarighi et al. (2019), and Sánchez-Ballesta and Yagüe (2021) agreed to employ direct approaches to measure social capital, using norms and networks.

As discussed earlier, for the first time, this study attempts to measure social capital with a new and comprehensive approach, simultaneously with a combination of direct and indirect ways, which can open up new pathways for researchers, from a research methodology perspective. In this study, in the first phase, we extracted the first component as a measure to assess each dimension of social capital using the PCA method. Then we added the figures obtained from all dimensions to obtain the total index of social capital at the province level. Table 7 not only presents the results of the PCA for each dimension of social capital, but it also presents the total index of social capital for each region, separately.

Table 7. The results of PCA.

Province	Year	1	2	3	4	5	6	7	8	9	10	SCI
Razavi Khorasan	2011	25/82	5/72	92/20	8/01	56/29	71/38	24/57	38/42	68/50	38/65	429/56
Razavi Khorasan	2012	27/90	5/38	92/04	8/37	72/95	71/67	25/19	38/48	68/90	38/99	449/87
Razavi Khorasan	2013	27/72	5/25	92/53	8/35	72/11	74/17	25/49	40/78	68/90	39/18	454/48
Razavi Khorasan	2014	28/51	4/65	91/95	8/49	72/70	75/39	25/56	41/21	68/86	39/36	456/68
Razavi Khorasan	2015	29/49	4/07	90/36	8/41	74/22	74/64	25/40	41/21	69/80	39/46	457/06
Razavi Khorasan	2016	29/86	3/43	91/11	8/55	72/53	74/57	25/44	41/21	69/89	38/94	455/53
Qazvin	2011	16/53	8/16	75/64	7/99	54/81	64/02	23/97	24/99	60/08	29/03	365/22
Qazvin	2012	16/56	6/65	76/25	8/23	69/21	66/62	24/06	29/06	60/18	29/31	386/13
Qazvin	2013	20/15	5/66	76/04	8/38	59/65	69/75	24/17	30/65	59/92	29/47	383/84
Qazvin	2014	20/08	5/10	75/69	8/53	69/82	68/67	24/21	30/86	59/98	29/64	392/58
Qazvin	2015	23/55	4/72	75/72	8/57	67/72	69/27	24/30	31/19	60/37	29/84	395/25
Qazvin	2016	22/86	4/13	76/06	8/73	67/72	69/43	24/42	31/67	60/45	30/42	395/89
Tehran	2011	30/35	3/47	96/71	8/22	67/28	66/76	29/07	24/68	72/43	43/35	442/32
Tehran	2012	32/24	3/08	93/79	8/37	74/35	68/07	28/92	24/82	73/47	41/96	449/07
Tehran	2013	31/56	2/96	92/70	8/44	75/66	71/76	28/56	25/79	72/89	42/11	452/43
Tehran	2014	33/26	2/64	92/30	8/72	76/36	72/73	28/91	26/33	72/78	42/65	456/68
Tehran	2015	33/98	2/92	92/14	8/93	74/15	70/78	30/75	26/64	73/14	43/14	456/57
Tehran	2016	33/98	2/43	92/96	9/10	74/15	71/04	30/60	26/37	73/28	43/39	457/3
Qom	2011	18/99	5/31	75/39	7/90	60/29	58/55	23/49	36/43	57/85	28/87	373/07
Qom	2012	18/95	4/30	75/49	7/91	61/03	61/40	23/68	34/74	58/29	29/20	374/99
Qom	2013	19/59	5/21	76/95	8/15	57/72	59/85	24/12	35/02	58/50	29/37	374/48
Qom	2014	20/35	4/17	76/71	8/71	67/99	62/67	23/95	34/74	57/78	29/62	386/69
Qom	2015	21/04	4/37	76/52	8/86	70/03	62/85	24/11	34/57	57/81	29/79	389/95
Qom	2016	21/60	3/35	77/05	8/86	70/03	63/09	24/25	34/88	57/81	29/85	390/77
Gilan	2011	21/83	6/12	83/73	7/70	56/66	56/01	25/05	28/41	64/37	34/47	384/35
Gilan	2012	21/83	5/50	83/82	7/92	69/62	54/13	25/22	29/02	64/15	34/75	395/96
Gilan	2013	22/37	5/14	83/95	8/09	59/50	63/91	25/77	29/01	64/16	34/95	396/85
Gilan	2014	22/52	4/54	84/29	8/20	62/49	66/01	25/96	29/38	63/65	35/11	402/15
Gilan	2015	23/21	3/62	83/72	8/36	67/54	67/12	26/08	29/60	64/46	34/80	408/51

Table 7. *Cont.*

Province	Year	1	2	3	4	5	6	7	8	9	10	SCI
Gilan	2016	22/70	3/08	85/10	8/36	67/54	67/69	26/25	30/19	64/46	34/88	410/25
Isfahan	2011	24/28	6/63	91/86	7/66	71/89	70/60	26/80	35/91	68/08	38/35	442/06
Isfahan	2012	24/11	6/02	92/73	7/78	71/52	69/28	27/41	36/14	68/33	38/48	441/8
Isfahan	2013	24/94	5/58	92/43	7/85	71/25	71/72	27/94	36/62	68/29	38/76	445/38
Isfahan	2014	25/58	4/60	93/05	8/10	72/70	72/51	28/12	36/34	67/14	39/11	447/25
Isfahan	2015	26/06	4/92	89/88	8/31	72/64	74/31	28/22	36/31	68/09	39/11	447/85
Isfahan	2016	27/95	4/00	91/61	8/44	72/64	74/46	28/29	36/34	68/65	39/51	451/89
Khuzestan	2011	21/36	8/92	87/48	7/79	58/69	62/17	26/73	31/86	68/20	36/37	409/57
Khuzestan	2012	23/85	7/83	86/98	8/08	68/77	65/67	27/16	32/32	67/86	36/70	425/22
Khuzestan	2013	25/06	7/91	87/95	8/30	62/18	68/39	27/57	32/92	68/81	37/21	426/3
Khuzestan	2014	25/54	7/04	87/95	8/35	71/68	69/25	27/97	33/03	69/22	37/28	437/31
Khuzestan	2015	27/69	5/52	89/81	8/57	69/91	68/22	28/29	33/11	68/63	37/38	437/13
Khuzestan	2016	28/68	5/59	89/22	8/74	69/91	68/87	27/06	36/50	69/14	38/37	442/08
Mazandaran	2011	20/59	5/85	87/27	8/74	69/04	64/15	25/45	32/61	66/31	36/19	416/2
Mazandaran	2012	24/53	5/12	87/12	8/16	68/74	65/89	25/82	34/78	66/49	36/41	423/06
Mazandaran	2013	24/39	4/98	87/76	8/41	61/81	69/02	27/37	35/57	66/46	36/63	422/4
Mazandaran	2014	24/56	4/38	87/03	8/46	70/84	68/79	26/19	35/84	66/21	36/57	428/87
Mazandaran	2015	24/85	3/81	88/45	8/54	70/28	69/42	26/20	36/43	66/08	37/29	431/35
Mazandaran	2016	24/56	3/69	87/70	8/79	70/28	70/12	26/43	38/16	66/08	37/31	433/12
East Azerbaijan	2011	23/03	7/33	86/46	7/49	66/92	66/46	25/53	30/04	66/11	35/40	414/77
East Azerbaijan	2012	24/06	6/75	87/19	7/57	72/91	66/20	25/59	30/30	61/19	35/63	417/39
East Azerbaijan	2013	23/64	6/36	87/82	7/82	72/12	69/88	25/80	30/17	66/59	35/39	425/59
East Azerbaijan	2014	24/12	5/93	89/10	8/16	74/26	70/11	26/05	30/40	66/94	36/01	431/08
East Azerbaijan	2015	24/72	5/27	86/44	8/21	72/65	70/98	26/18	30/52	67/94	35/21	428/12
East Azerbaijan	2016	24/58	4/61	87/14	8/60	72/65	71/65	26/37	33/52	68/31	35/41	432/84
Zanjan	2011	21/46	8/43	77/82	7/47	58/03	61/04	24/13	19/23	59/22	29/55	366/38
Zanjan	2012	22/11	8/63	76/68	7/40	66/53	60/85	24/20	19/21	59/43	29/55	374/59
Zanjan	2013	21/37	8/65	76/36	7/82	59/18	63/18	24/23	19/39	59/51	29/72	369/41
Zanjan	2014	21/83	8/45	76/26	7/43	66/72	65/19	24/62	22/45	59/22	29/93	382/1
Zanjan	2015	22/53	6/63	78/30	8/23	67/66	67/33	23/85	20/90	59/28	30/00	384/71
Zanjan	2016	22/03	5/75	77/95	8/62	67/66	67/87	23/89	28/69	59/43	30/08	391/97
Markazi	2011	23/05	6/21	82/16	7/91	64/10	63/88	24/57	22/67	61/17	31/31	387/03
Markazi	2012	23/59	5/97	83/17	7/76	63/72	63/07	24/99	22/72	61/18	31/27	387/44
Markazi	2013	23/69	5/22	84/57	7/90	70/06	65/33	25/35	23/55	60/92	31/37	397/96
Markazi	2014	22/77	4/47	84/83	8/10	69/31	65/71	26/46	24/17	60/20	31/50	397/52
Markazi	2015	22/93	3/81	84/85	8/16	69/65	66/38	25/68	24/13	60/63	31/64	397/86
Markazi	2016	22/54	3/39	83/61	8/42	69/65	66/66	25/75	24/77	61/19	30/63	396/61
Yazd	2011	14.21	11/47	80/78	8/00	62/27	64/16	24/73	27/95	60/00	30/02	369/4
Yazd	2012	14.02	9/63	82/04	8/01	59/39	62/54	23/35	29/79	60/50	30/31	379/65
Yazd	2013	13.84	9/38	82/22	8/33	59/63	65/53	23/99	30/53	60/64	30/67	384/76
Yazd	2014	12.79	8/78	80/40	8/31	69/05	68/15	24/18	30/80	60/23	30/65	394/75
Yazd	2015	15.61	7/37	80/35	8/59	66/37	64/30	24/31	33/31	59/90	30/41	385/08
Yazd	2016	11.37	6/21	80/36	8/54	66/37	64/33	16/64	33/57	59/88	30/64	377/91
Ilam	2011	17/74	14/37	70/84	7/78	44/99	55/42	21/20	21/75	57/02	25/94	337/05
Ilam	2012	16/59	14/03	69/50	7/80	53/24	56/74	21/34	21/55	56/53	25/84	343/16
Ilam	2013	16/46	12/81	69/64	7/72	54/06	57/09	21/86	21/64	56/54	25/90	343/72
Ilam	2014	19/54	10/06	70/04	8/17	61/47	59/04	22/02	22/34	56/41	26/40	355/49
Ilam	2015	21/74	9/78	68/10	8/09	61/59	58/53	22/07	22/78	56/26	26/74	355/68
Ilam	2016	21/15	9/04	67/83	8/47	61/59	58/53	22/07	25/99	56/34	26/59	357/6
Lorestan	2011	21/76	8/88	79/00	7/80	54/76	63/32	24/43	21/70	62/65	31/82	376/12
Lorestan	2012	21/61	8/59	78/82	10/45	64/39	62/79	24/63	20/95	63/31	31/45	386/99
Lorestan	2013	21/31	7/44	80/34	7/79	68/65	67/12	24/70	25/06	63/10	31/76	397/27
Lorestan	2014	22/20	6/43	80/04	8/07	65/02	66/44	24/72	25/88	62/64	32/48	393/92
Lorestan	2015	22/78	5/93	78/15	8/27	68/27	67/11	25/00	26/07	63/21	32/80	397/59
Lorestan	2016	23/02	5/40	77/69	8/33	68/27	67/63	25/09	26/99	63/18	32/41	398/01
Kermanshah	2011	22/15	6/24	79/06	7/73	52/14	57/46	22/57	22/07	60/02	31/45	360/89
Kermanshah	2012	22/89	5/30	78/60	7/72	55/23	57/85	22/61	22/45	60/36	31/50	364/51
Kermanshah	2013	23/35	5/15	79/63	8/09	55/72	62/56	19/52	22/97	59/72	31/59	368/3
Kermanshah	2014	23/51	4/75	79/35	8/21	64/04	63/39	24/65	24/01	60/25	31/87	384/03

Table 7. *Cont.*

Province	Year	1	2	3	4	5	6	7	8	9	10	SCI
Kermanshah	2015	24/02	4/18	80/51	8/34	64/21	65/00	24/68	24/14	61/03	32/04	388/15
Kermanshah	2016	23/32	3/79	83/49	8/39	64/21	65/02	24/75	24/04	60/83	32/31	390/15
Semnan	2011	18.03	8/61	72/24	7/93	59/24	61/09	22/62	34/16	55/07	27/69	366/68
Semnan	2012	18.94	5/50	74/05	7/33	64/66	61/73	22/98	33/67	55/66	27/58	372/1
Semnan	2013	19.27	5/21	75/47	8/17	69/51	62/79	23/05	35/85	55/74	27/14	382/2
Semnan	2014	15.01	4/26	73/79	8/19	68/69	63/39	23/35	36/27	54/95	27/96	375/86
Semnan	2015	14.74	4/43	73/79	8/23	63/17	65/96	23/40	36/42	55/80	27/96	373/9
Semnan	2016	14.85	4/15	73/80	8/24	63/17	65/98	23/46	36/75	56/57	27/96	374/93
Hamedan	2011	22.12	7/19	81/44	7/85	60/10	63/53	24/46	23/33	61/63	31/58	383/23
Hamedan	2012	20.45	6/59	81/63	7/94	58/21	66/13	24/76	23/67	62/39	31/62	383/39
Hamedan	2013	25.03	6/55	82/28	8/34	71/02	67/59	24/68	23/83	62/38	32/07	403/77
Hamedan	2014	25.91	6/13	82/24	8/45	71/20	68/36	25/00	23/45	62/32	32/29	405/35
Hamedan	2015	24.36	5/32	83/55	8/56	69/17	68/70	25/49	24/20	62/78	32/38	404/51
Hamedan	2016	24.36	4/71	83/71	8/56	69/17	68/70	25/52	24/28	62/81	32/77	404/59

Code: 1 (trust dimension); 2 (family stability dimension); 3 (culture dimension); 4 (welfare dimension); 5 (humanitarian activity dimension), 6 (religion dimension), 7 (sport dimension); 8 (freedom of expression dimension); 9 (education dimension); 10 (healthcare dimension); SCI (Social Capital Index).

What stands out from Table 7 is that the number 457.3 belongs to the capital of Iran, which has the highest level of social capital, while Ilam, with an index of 337.05, is at the bottom of this list. Given that Tehran, with a population of 15.27 million, is the most crowded city in Iran, but Ilam, with 557,599 people, has the lowest population, it can be inferred that the population of each region has a vital role in improving the quality of social capital. The figures obtained from Tehran and Ilam highlight the fact that geographical areas can have positive effects on social capital. By looking at the details, we can find that Tehran ranks first in terms of trust, culture, charitable activities, and healthcare, whereas Ilam is in the last place. However, regarding family stability, there is an opposite trend, as Ilam pays the most attention to maintaining a family foundation, although Tehran experiences the worst possible situations among different regions. In other words, as there are still more roots of historical and ancient customs in Ilam, people living there pay more attention to the sacred values of the family and make more effort to maintain the solidarity of their family environments, while Tehran is a modern city where the cost of living is so staggering that severe economic pressures disrupt the peace of mind of families.

From the point of view of economic welfare, the results of PCA show that Lorestan is the most desirable city in Iran, although the living and financial situation of people living in the Semnan region is poorer than other areas of Iran. It is similarly seen that this city ranks last in terms of education. Furthermore, Mashhad is one of the most important religious cities in the Middle East; every year, many Muslims from all over the world visit the holy shrine of Imam Reza for pilgrimage. For this reason, it is considered the most religious point of Iran. On the other hand, before the outbreak of World War I and its extension to Iran, the Gilan province was attacked by British forces in 1918. Since then, to some extent, the footprint of Western and non-Islamic culture can be seen more in the Gilan region; hence, the PCA confirms people who live here are less religious than in other parts of Iran. In terms of freedom of expression, our outcomes show that the city of Mashhad is still at the top of the list, while the shadow of a heavy political atmosphere is felt in Zanjan because they have less freedom of expression.

4.7. The Results of the First Model

The purpose of our first study model was to investigate the impact of social capital on audit costs among firms listed on the TSE. The results of estimating the parameters of this model are shown in Table 8.

Table 8. The results of the first model.

Variable	Coefficient	S.D.	T-Statistic	*p*-Value
β	−377.676	79.07398	−4.78	<0.0001 ***
AUDITOR CHANGE	−0.01367	0.09087	−0.15	0.8302
AUDIT TENURE	−0.04142	0.01375	−3.01	0.0027 ***
FIRM SIZE	0.28776	0.02182	13.19	<0.0001 ***
FIRM AGE	−0.01121	0.00417	−2.69	0.0074 ***
DIVIDENDS	−0.01574	0.23672	−0.07	0.9470
TOBIN'S Q	0.31751	0.68153	4.68	0.0002
LOSS	0.06276	0.10181	0.62	0.5379
ROA	−0.15959	0.20549	−0.78	0.4377
BIG1	0.33098	0.07732	4.28	<0.0001 ***
DAYS TO SIGN	0.16405	0.06059	2.71	00.0070 ***
UNQUALIFIED OPN	−0.00214	0.06023	−0.04	0.6816
SPECIALIST	0.16205	0.06939	2.34	0.0199 **
INHERENT RISK	0.04360	0.01378	3.16	0.0017 ***
ANNUAL INFLATION	0.01687	0.00365	4.62137	0.0000 ***
COST OF LIVING	−6.83724	9.737132	−0.70	0.2651
LN POP	20.46169	4.37442	4.68	<0.0001 ***
POPG	−1.54801	1.05475	−1.47	0.1428
SOCIAL CAPITAL	0.29320	0.07121	4.12	<0.0001 ***
SEGMENTS	−0.05010	0.01493	−3.36	0.0008 ***
RURAL	−0.00922	0.10798	−0.09	0.9351
GEOGRAPHICAL AREA	0.00000127	0.00000171	0.74	0.3580
INDUSTRY INDICATOR	Yes			
YEAR INDICATOR	Yes			

Confidence level (**): 98% confidence level: 99% (***); R-square: 0.53, Adj R-square: 0.51, F-statistic: 26.37, prob (F-statistic): 0.0001, Durbin–Watson: 1.97.

Table 8 shows some very interesting results. Given the fact that the amount of the *p*-value for social capital is 0.0001 and its coefficient is a positive figure, the first hypothesis of this research is supported by sufficient evidence that should be accepted, meaning, there is a positive and significant relationship between social capital and audit fees. Contrary to the results of Jha and Chen (2015), Jha (2019), and Sánchez-Ballesta and Yagüe (2021), in developed countries, we realized Iranian auditors could not judge the trustworthiness of their clients based on where the firms were headquartered. Managers of the Iranian companies have not been affected by a sense of guilt due to social norms, and social networks have not been able to increase the perceived costs of selfish decisions through more effective punishments. The difficult economic conditions of the Iranian market seem to have caused the dark dimensions of social capital to emerge. When management feels that the company is collapsing and going bankrupt, in times of financial distress, feelings of fear may overwhelm a manager's sense of guilt, and cause management to perform actions to relieve their company of financial pressures, and not pay too much attention to ethical issues. To put it another way, Iranian managers of firms headquartered in regions of higher social capital, have attempted to abuse people's trust, so they can mask their weak performances by performing profit management activities and manipulating financial information. A more detailed analysis of the LN POP variable highlights the fact that, since there is a possibility of the formation of stronger social norms and networks in densely populated cities, directors are abusing the potential of social capital in these areas for their deceptive actions. For this reason, a positive relationship between LN POP and audit fees cannot be too far from the expectation. The evidence also shows that a greater number of geographical segments can be a good deterrent to prevent opportunistic management behaviors, which eventually helps to reduce the audit risk. In this regard, Jha and Chen (2015) argue that although the key managers who influence financial reporting are often located in the firm's headquarters, the employees in other geographic locations also affect the accounting information systems and the firm's financial reports.

As for the characteristics of audit firms, we can say that there is a negative linkage between audit firm tenure and audit costs. One interpretation of this result is that when auditors become more knowledgeable about the client's business over time, they are subject to fewer audit risks and, therefore, will not charge a premium when they trust the firm more. Consistent with our expectations, the outcomes show that big audit firms receive more fees. This is because they not only have a more specialized and experienced workforce, and use more up-to-date technologies, but they will also make more efforts to detect possible financial fraud because they have special credibility within the society. Furthermore, we saw a positive association between auditors' industry specialists and audit costs. According to Fung et al. (2012), the level of industry specialization of the auditors and their economies of scale has an impact on audit fees. Moreover, audit costs have been significantly affected by delays in the audit report. Delays in auditors reports stem from the fact that when companies' business operations become more complex and opaque, auditors will have to spend more time identifying potential financial reporting fraud (Jha and Chen 2015). According to Simunic (1980), audit fees can increase, owing to more audit work and more expected losses. Regarding the corporate features, our findings witness a positive association between firm size and audit fees, while firm age and audit costs are correlated negatively. Large firms are under more pressure from investors and financial analysts to show positive earnings. Large firms not only have access to more transactions, but they also have more bargaining power to negotiate with auditors, which makes it easier to manipulate the earnings (Ali et al. 2015). Older companies also seem to prefer to avoid fraudulent financial practices because they have greater reputations in the market compared to younger ones. Moreover, companies with higher inherent risks pay higher auditing fees to auditors. Finally, the results confirm that the inflation rate is one of the determinants of increasing audit fees. As inflation increases, as with the costs of goods and services, so do the costs of auditing as professional services.

4.8. The Results of the Second and Third Models

The second model studies the impact of intellectual capital (IC) of firms on audit fees; moreover, our third research model tends to investigate the relationship between different components of IC and audit costs. Hence, the results of the above hypotheses are provided in Table 9.

As mentioned earlier, the effects of intellectual capital on managerial decisions in financial reporting can be like a double-edged sword. On the one hand, since intellectual capital can solve the firm's problems faster, a manager who has high intelligence is unlikely to perform earnings management (Schultz and Schultz 2020). On the other hand, the company's management sometimes uses its intelligence to cheat by manipulating earnings in financial reports so it can hide the weak financial performance from investors and lenders (Jaya et al. 2021). We did not find any credible evidence of a significant relationship between intellectual capital and audit fees in the Iranian market. The results were similar for human and structural capital as two components of IC. However, the results of this study experienced a dark side of physical and financial capital. Our findings suggest that the higher the capital employed efficiency (CEE), the higher the audit risk and, consequently, the audit fee. Given the economic conditions of the Iranian market, it seems that managers tend to manipulate financial information using various techniques to identify the depreciation of assets. It is also conceivable that Iranian managers may show shorter maturities of their financial assets to demonstrate better the liquidity of such assets in Iran's inflationary economy. It is also possible that managers will not record the costs of such services in the financial statements if they hire qualified attorneys to cash their financial assets. It seems that these physical and financial assets have led to using more managerial estimates, which ultimately undermine the quality of financial reporting. We also find that there is a positive connection between the ratio of Tobin's Q and audit fees, whereas the BM ratio harms agency problems. It could be argued that companies whose market values are greater than the values of their assets and have been able to make optimal use of their assets may

have been involved in earnings management activities, which increased their audit risk. However, firms with a high book-to-market ratio may not tend to financial information manipulation.

Table 9. The results of the second and third models.

Variable	Second Model		Third Model	
	Coefficient	***p*-Value**	**Coefficient**	***p*-Value**
β	2.324739	0.0004 ***	2.112958	0.0013 ***
VAIC	−0.005394	0.2451	-	-
HCE	-	-	−0.003951	0.1957
SCE	-	-	0.029645	0.4863
CEE	-	-	0.083102	0.0021 ***
TOBIN' Q	2.978553	0.0000 ***	3.001216	0.0002 ***
BM	−0.003918	0.0391 *	−0.009694	0.0376 *
GROWTH	−0.098564	0.1152	−0.076583	0.2361
CURRENT	−0.009492	0.0471 *	−0.037966	0.0394 *
LEVERAGE	0.056192	0.8467	0.061346	0.8721
FIRM SIZE	0.361285	0.0003 ***	0.395682	0.0024 ***
FIRM AGE	−0.001214	0.0034 ***	−0.009546	0.0002 ***
OVERCONFIDENCE	−0.003158	0.0193 **	−0.045617	0.0467 *
RPTs	0.094510	0.0297 *	0.064115	0.0417 *
INSTITUTIONAL	−0.113514	0.0490 *	−0.265913	0.0315 *
ICW	0.009613	0.3495	0.056419	0.2347
BIG1	0.038467	0.0021 ***	0.098651	0.0053 ***
INDUSTRY INDICATOR	Yes		Yes	
YEAR INDICATOR	Yes		Yes	

Confidence level (**): 98% confidence level (*): 95% confidence level: 99% (***); second model: R-square: 0.82, adj R-square: 0.80, F-statistic: 6.0131, prob (F-statistic): 0.0000 Durbin–Watson: 1.96; third model: R-square: 0.85, adj R-square: 0.83, F-statistic: 6.0094, prob (F-statistic): 0.0000 Durbin–Watson: 1.79.

The result of the current ratio's variable also shows that the better "financial ability" the companies have to pay off their short-term debts, the less inclined they are to manipulate their financial information, which helps reduce audit fees. Furthermore, the negative and significant relationship between managerial overconfidence indicates that Iranian companies with overconfident managers may have used lesser-known auditors or requested fewer audit services so that auditors had less "rigor" or oversight over their aggressive accounting practices. Due to the strong conflict of interests and many incentives to conduct profit management in the Iranian market (Zimon et al. 2021), our evidence shows a positive association between related party transactions (RPTs) and audit costs. To put it another way, Iranian corporate managers seem to participate in RPTs to expropriate corporate resources, then they act to distort earnings to justify or increase these perquisites or possibly to mask such expropriation, which is exactly in line with the "tunneling" hypothesis. We also find that significant weaknesses in the internal control systems have led to a deterioration in the quality of financial reporting and an increase in auditing fees, although not statistically significant. Finally, our findings show a negative and meaningful correspondence between institutional ownership and audit fees. As mentioned earlier, institutional investors in the Iranian market are mainly composed of state-owned and quasi-governmental organizations, and more importantly, nearly two-thirds of the corporate ownership structure has been taken over by institutional shareholders (Moradi et al. 2012). This means that Iran's government has a key role to play in the overall policies of companies and can monitor them well. In fact, institutional ownership in Iran, as one of the corporate governance mechanisms, has been able to control agency problems and protect the interests of shareholders well, which is consistent with the view of Shleifer and Vishny (1997), as well as Zimon et al. (2021).

5. Conclusions and Discussion

Our findings show a positive relationship between social capital and audit fees. This means that the Iranian companies headquartered in provinces with high-quality social capital pay higher audit fees. In other words, the Iranian auditors do not judge the honesty of their clients based on where the firm is headquartered. Contrary to previous research literature, indicating that higher social norms through an increased sense of guilt, as well as higher network density through increased punishment can induce managers to behave more honestly when providing financial reporting (Jha and Chen 2015; Fukuyama 1997; Milgram et al. 1969; Cialdini et al. 1991; Akerlof 2007; Wu 2008; Coleman 1994; Spagnolo 1999), our findings confirm that severe financial pressures stemming from economic crises may lead to the emergence of dark dimensions of social capital in management decisions. Difficult financial circumstances sometimes lead to a sense of fear of bankruptcy and the collapse of the company, which causes managers to manipulate the financial statements in such a way to attract more investors and creditors in the market. According to Jha and Chen (2015), social capital measures the level of mutual trust in a region, and auditors often judge the trustworthiness of their clients based on where the firm is headquartered. Accordingly, since Iranian auditors have more confidence in the honesty of companies located in areas with high social capital, managers of these companies have considered the possibilities of detecting financial figures who are being manipulated by the auditors less, and they have attempted to provide more attractive financial images of their companies by performing profit management activities. Our findings are inconsistent with the results of Yue (2010), Jha and Chen (2015), Chen et al. (2021), Sánchez-Ballesta and Yagüe (2021), etc. Unlike the Iranian market, most past research has been conducted in developed markets, and the managers of such companies have never been under severe financial pressure. Therefore, financial pressures can sometimes be major factors in shaping the negative effects of social capital when preparing financial reporting.

The results of our paper also indicate that Iranian firms with high intellectual capital insignificantly reduce the audit risk and audit fees. In fact, the intangible assets of Iranian companies, in the form of resources, capabilities, and competencies, have not been of sufficient quality to improve organizational performance, in a way that managers do not seek to manipulate profits. Similarly, among the components of intellectual capital, no significant relationship was found between human and structural capital and agency costs. However, the outcomes witnessed positive connections between employed capital (physical and financial capital) and audit fees, as Iranian directors are likely to show lower depreciation rates by not showing the inefficiency of fixed assets, so that they can absorb the confidence of investors by reflecting better their net profits. In addition, managers are expected to show shorter maturity dates of their financial assets, such as accounts receivable, and hide the costs related to receivables collections, so that they can better show their corporate financial performance in financial turbulence.

What sets this paper apart from other studies is that the time under study is unique because of the many financial problems experienced by Iranian companies. Furthermore, in terms of methodology, this paper seems to be one of the first and most complete research studies ever to examine social capital from different angles, simultaneously. The contribution of this study is two-fold. First, it shows that the social environment, in a situation where the economic market is insecure and shaky, can have a devastating effect on the firm–auditor relationship. In fact, the results of this study warn investors, creditors, and other regulators that although trust is an important component of the auditor–client relation, local social capital sometimes can be a deceptive tool to abuse an auditor's trust, so that opportunistic managers can more easily manipulate their financial statements to present a better picture of their financial performance, for the purpose of possessing better financing. The findings of this study also send a message to various stakeholders in the market that when managers are under severe financial pressure, they not only may not care much about gaining a competitive advantage through intellectual capital but are also

more willing to use it as an effective tool to distort earnings, so that they can attract more investors and creditors.

Another vital point is that since the government plays a very important role in the economy of Iran, there are no preconditions of advanced economies in our country. For example, there are very rare instances of litigation against the auditing profession in Iran. Due to the weakness of the accountability culture, as well as the state of the economy, there are almost no direct beneficiaries who interpolate the auditor for possible mistakes and negligence. Another important point concerning the Iranian auditing market is that the name of the biggest audit firm is the auditing organization (BIG1), and the majority of Iranian firms are audited by it. The auditing organization has a monopoly because of its governmental ownership and high professional performance. It seems that this big audit firm, due to its features, such as having a monopoly market, high dating, and being state-owned, receives higher fees compared to other competitors. In Iran, the public sector spends a lot of money on auditing, and the experience has often shown that the public sector does not have enough compassion or supervision to undertake the least-costly audit work compared to the private sector, resulting in increased audit fees of the public sector. The most important point is that inflation and society's economic conditions can affect audit costs. In the direction of inflation and the growth of the price level, the cost of doing work, especially the salaries of manpower, increases. In an inflationary economy, since costs are constantly rising, auditors are expected to demand higher wages for their expected profits (NikBakht and Tanani 2010).

When conducting any research, there are some restrictions on the researchers, and this research is no exception. Since there is no access to information concerning some of the criteria for measuring social capital in Iran, in this study, we were limited in applying some of the criteria. In addition, since the data of many of the criteria used in this study to measure the social capital index were only available until 2016, it is not possible to conduct this research for a longer period. Furthermore, given that the time of the present study in Iran coincides with a financial crisis caused by sanctions, and that the sample companies may be different in terms of size, organizational structure, and type of products, generalization of our findings should be made with caution.

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