



Intellectual Capital, Social Capital Components and Internal Control Weaknesses: evidence from Iran's business environment

Journal:	<i>Journal of Islamic Accounting and Business Research</i>
Manuscript ID	JIABR-05-2022-0121.R3
Manuscript Type:	Research Paper
Keywords:	social capital, intellectual capital, IT, internal control weakness

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Abstract

Purpose– This paper aims to determine whether there is a relationship between intellectual capital and social capital and internal control weaknesses and assess the relationship between the variables of intellectual capital and social capital and internal control weaknesses.

Design/Methodology/Approach– The statistical population consists of 1309 firm-year observations from 2014 to 2020. The research hypothesis is tested using statistical methods, including multivariate, least-squares, and fixed-effects regression.

Findings– The results demonstrate a negative and significant relationship between intellectual capital, social capital, and internal control weaknesses. The study also finds that increased intellectual and social capital quality improves human resource utilization, control mechanism, creativity, and firm performance. The results also show that intellectual capital and social capital enhancement will reduce internal control weaknesses in the upcoming years.

Originality/value– This paper is the pioneer study on the relationship between intellectual capital and social capital and internal control weaknesses in Iran, carried out separately and in exploratory factor analysis. This paper considers intellectual capital components for theoretical factor analysis, including human capital, structural capital, and customer capital. Internal control weakness is assessed based on financial, non-financial, and IT weaknesses.

Keywords: intellectual capital, social capital, internal control weakness

1. Introduction

The quality of financial reporting has been a concern of scholars for a long time. The internal elements of firms, such as internal control mechanisms and other accounting factors, such as cost behaviour, are explanatory in this regard (Salehi et al., 2018). It is believed that internal controls have played a vital role in running companies in recent years (AICPA, 2001; COSO, 2013). Internal controls' primary goal is to reestablish the investors' trust in companies by improving the disclosure. According to financial statements, firms and audits must evaluate and report internal controls' main weaknesses (PCAOB, 2004). On the one hand, a strong internal control system may improve a company's performance (Feng, Mcvay and Skaife, 2015; Zhou, Chen and Cheng, 2016), reduce the risk of falling stock prices (Chen et al., 2017), increase innovation (Li, 2020; Chan, Chen and Liu, 2021), equity and the company's financial performance (Vu and Nga, 2021) and reduce fraud by company employees (Nawawi and Salin, 2018). In other words, the strong internal control mechanisms might result in positive outcomes by strengthening regulatory systems, including internal control and financial reporting quality (Altamuro and Beatty, 2010) and increasing accounting information comparability (Li, Xia and Wu, 2022). On the other hand, a lack of strong internal controls in companies may have a negative impact on the cost of equity (Gordon and Wilford, 2012; Zakaria, Novavi and Salin, 2016). Also, an effective internal control system has been introduced as one of the critical factors in fraud prevention, and companies with poor internal control mechanisms are more likely to prepare poor financial reporting quality (Qish and Lee, 2013; Lari Dashtbayez, Salehi and Safdel, 2019). The meta-analysis of Daemigah (2020) shows that auditors may charge larger companies, as well as companies with weaker internal control systems, lag in their audit reports (Atridge, Lee, & Sun, 2006) and usually pay higher audit fees (Bae et al., 2021). Salehi et al. (2019) demonstrate that expert auditors are willing to improve audit quality. Therefore, the literature propositions and empirical findings show the importance of internal control mechanisms in business environments. Such a prominent element has motivated the authors to shed further light on two other potentially influential factors, including IC and SC, on the internal control weaknesses in Iran's business environment.

IC comprises an organization's expertise, knowledge and associated intangible assets (Li-Chang & Wang, 2012; Tayles et al., 2007; Widiatmoko et al., 2020). Further definitions also describe IC as the accumulated intangible assets within an organization (Nkundabanyanga, 2016). More specified definitions express IC into some sub-components, including human, structural and relational capitals (Bontis et al., 2000; Clarke et al., 2011; Riahi-Belkaoui, 2003). Human capital implies a company's employees' talents, skills and expertise needed to practice

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3 their daily occupational responsibilities (Rezaei and Mousavi, 2015). Structural capital
4 includes the necessary infrastructure, databases and processes of a company designed to assist
5 its human capital in operating (Kamukama, 2013). Relational capital mainly refers to the
6 abilities, opportunities, knowledge, systems and procedures remarkably developed based
7 on
8 the external relationships of a company (Kalkan et al., 2014). Some scholars argue that
9 intellectual capital components comprising human capital, structural capital, and relational
10 capital may have a positive impact on the strength of internal controls (Kaawaase et al., 2019;
11 Bananuka et al., 2019; Nkundabanyanga, 2016; Rezaei and Mousavi, 2015; Kalkan et al., 2014;
12 Kamukama, 2013; Bontis, 2001; Bontis et al., 2000); Because it is argued that internal controls
13 might be more effective in atmospheres where they are supposed to be practically prominent.
14 Thus, improved structural, human, and relational capital might establish effective internal
15 controls. Studies show that the staff's non-qualification usually leads to inefficiency in internal
16 controls (Doyle, Ge, and Mcvay, 2007). Since employees are the firm's IC, managers expect
17 them to detect weaknesses and deal with fraud (Sahloul, 2019). Employees and their
18 experiences are among the main factors in economic growth, without which any expectation
19 for growth is fruitless (Pokynchereda, Gudzenko, and Nastenکو, 2017). The company's ability
20 to manage human resources creates a competitive advantage (Chadwick and Flinchbag, 2021).
21 In addition, social capital theory concentrates on the interrelationships of individuals with
22 internal and external bodies to mobilize their resources more effectively to meet higher returns
23 (Burt, 2001, 2007, Adler and Kwon, 2002). The SC, which might also result from a given firm's
24 environmental-friendly activities, may be considered influential in improving corporate
25 governance mechanisms such as internal control effectiveness. Previously conducted empirical
26 papers suggest that firms engaged in corporate social responsibility may apply effective
27 business procedures to improve the accountability and transparency of financial reports to
28 satisfy the stakeholders. Kim et al. (2012) argue that socially accountable firms improve their
29 financial reporting quality through less accruals and real earnings management. Therefore, it is
30 expected that companies possessing more social capital, due to their moral behaviour, are likely
31 to practice cooperation in trust with their stakeholders, preventing them from opportunistic
32 behaviour (Jones, 1995). In other words, firms with more SC will likely improve their reporting
33 quality through stronger internal controls.

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55 The current paper extends the accounting literature to some extent. This research is among the
56 pioneer attempts to assess the role of intellectual capital advancement in business markets and
57 its impact on improving internal controls. Prior studies mostly emphasized the relationship
58 between social structure and creativity (Sozibilir, 2018) and the influence of intellectual capital
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3 on firm performance (Hashim, Osman, and Alhabshi, 2015; Ginesti, Caldarelli and Zampella,
4 2018; Lee and Lin, 2019). This study is concerned with the relationship between intellectual
5 capital and the weaknesses of internal controls. It is postulated that intellectual and social
6 capital improve internal controls with more creativity. Furthermore, to the best of the authors'
7 knowledge, this study is the first research providing detailed outcomes regarding the types of
8 internal control weaknesses such as financially-related, financially-unrelated and IT-related
9 internal control weaknesses. Additionally, most studies having relevant research questions are
10 conducted in non-Islamic countries; for instance, the association between intellectual capital
11 components and corporate governance mechanisms are examined in Mexico (Hidalgo et al.,
12 2011), the relationship between social capital and corporate governance in the UK and USA
13 (Booth-Bell, 2018) and Australia (Subramaniam et al., 2013). This is among the first studies
14 dealing with a specific component of corporate governance mechanisms and social and
15 intellectual capital components in an Islamic country. Finally, in terms of statistical approach,
16 in the present study, the factor analysis of intellectual capital components, including human,
17 structural and customer capital, is used for the first time to measure the intellectual capital and
18 factor analysis of three financial weakness variables, non-financial weaknesses and IT internal
19 control weakness. The Legatum welfare index is used for measuring social capital.

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21 The rest of the paper is arranged as follows. The authors discuss the theoretical framework and
22 present related literature in the next section. Then, the research methodology and variable
23 definitions are included. In the fourth section, the authors provide obtained results and discuss
24 them. Finally, in the fifth section, the paper is concluded.

2. Theoretical issues and literature review

2.1. *The weakness of internal controls*

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26 According to the COSO framework, the board of directors and other staff are required to design
27 the internal control mechanisms to achieve the three objectives: 1. Operational efficiency; 2.
28 Financial report insurance; and 3. Compliance with relevant rules (King, 2016; Rae, sands, and
29 Subramaniam, 2017). Control environment, risk evaluation, control activities, information, and
30 monitoring are internal control components that affect goal achievement (King, 2016; Rae,
31 Sands, and Subramaniam, 2017). The factors also affect internal controls: firm size, financial
32 risk, operational complexity, and available company (Krishnan, 2005; Ashbaugh Scaife et al.,
33 2007; Doyle, Ge, and MCvay, 2007).

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35 A strong internal control system should turn a business unit with various goals into a business
36 entity having a unified purpose (Ouchi, 1979). Effective internal controls may lead to
37 competitive advantage because it enables firms to deal with more risks (IFAC, 2012). After the
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3 financial scandals, SOX obliged managers to analyze internal controls. According to SOX's
4 act, management and auditors are required to evaluate internal controls and disclose their
5 potential weaknesses. Thus, companies that improve their internal control weaknesses might
6 achieve better results (Feng et al., 2015). Chang et al. (2019) show that a bigger auditing system
7 increases the performance of internal auditing. They also offer a positive relationship between
8 internal audit proficiency and the effectiveness of internal control.
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11 To obtain a more precise and detailed set of findings, the financial, non-financial, and IT-
12 related weaknesses are investigated discriminately in this study. Since IT enhancement has
13 played a monitoring and controlling role in financial markets in recent decades, analyzing the
14 weaknesses of internal controls related to IT environments, including access to policies,
15 programs, data, computer operations and change management, may provide significant
16 information for practitioners (Kuhn et al., 2013). Typically, IT controls consist of two parts
17 comprising public sector controls (IT environments such as computer operations and access to
18 applications and data) and practical controls (input and output and information processing)
19 (Romney and Steinbart, 2009). In this regard, Abbaszadeh, Salehi, and Faiz (2019) found a
20 significant relationship between information technology and internal controls (administrative
21 controls, financial and accounting, risk evaluation, information, and control activities).
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24 **2.2. Intellectual Capital**

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26 The intangible economic aspect is based on intellectual capital, the main component of
27 information and knowledge. Corporations need these two components to participate in markets
28 and improve performance (Lev, 2000). Intellectual capital is one of the main concepts of
29 intangible assets (Venieris, Naoum, and Vlismas, 2015), which creates value for the company
30 through existing knowledge (Allameh, 2018).
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33 Since IC is a valuable tool for firms and can have an influence on most organizational factors,
34 it has attracted the attention of most firms, managers, and scholars and shows why this factor
35 is essential for organizations (Hamdan, Buallay and Alareeni 2017; Lee & Lin 2019; Dabic et
36 al. 2019). IC is also the most important strategic asset in evaluating a firm's performance in
37 developed and developing countries, and it is confirmed by most researchers (Khalique et al.,
38 2011; Amrizah & Rashidah, 2013; Ngah & Ibrahim, 2012). Skandia Insurance Company
39 considers IC's knowledge, practical experience, customer relationship, organizational
40 technology, and professional skills to improve its competitive advantage (Sofie, 1999; Xu and
41 Wang, 2019). IC is a commercial asset that has become a necessary resource and a significant
42 competitive advantage (Rodrigues, Tejedo Romero & Craig, 2017).
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Prior scholars suggest several components for IC comprising human capital, structural capital and relational capital (Bontis et al., 2000; Ahmed et al., 2022; Kusi-Sarpong et al., 2022; Aljuboori et al., 2022). Initially, human capital is defined according to individuals' skills, knowledge, ability, and experiences to generate wealth and resolve entities' problems. However, maintaining or keeping the human capital investment is difficult for managers as staff are the principal owners of human capital, not the organizations. Additionally, the SC, referring to formulated structures and processes in organizations, are applicable to increase the value through efficient use of expertise. In contrast to human capital, organizations are the primary possessors of SC, which their employees generate. Structural capital is all an organization's knowledge, including charts, databases, designed strategies, created trends, guidelines, processes and other similar things (Bontis et al., 2000). It is suggested that structural capital is permanently willing to generate competitive advantage for firms through investing in IT infrastructures and R&D. Finally, relational capital (also known as customer capital) is explained in IC literature. The central role of relational capital in value generation implies the used knowledge in merchandising and trading venues of organizations and their incorporation with their customers and external related parties. Salehi and Farzaneh (2018) believe that organizational connections might be established from different channels, such as making mutual knowledge with other entities and connecting with other families or related personal, family investment and partnership contracts. In a knowledge-based economy, intellectual capital is crucial to a company's growth and competitive advantage (Holland, 2003). As the competition grows, intangible assets become more important. Thus, ignoring them increases their weaknesses and reduces the investors' trust.

2.3. Social Capital

Over the last few decades, economists and other social scientists have paid increased attention to social capital and its link to economic performance (Calcagnini and Perugini, 2018; Tipu and Fantasy, 2018). Following Woolcock (2001), social capital is defined as the networks and norms optimizing the collective process. It is believed that such a definition is comprehensive (Jha, 2017) since it encompasses the broad consensus in social capital literature. In other words, the areas with greater social capital levels are characterized by a higher perception of obligations and mutual trust, and regions with wider networks and further norms correlate (Jha, 2017). Guiso et al. (2004) explain social capital as the degree of mutual trust and altruistic activities in a given society. Fukuyama (1997) also disputes social capital as '*the existence of a certain set of informal values or norms shared among members of a group that permits cooperation among them*'. Portes (1998) defines social capital as the individual's tendency to

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3 accept social norms over generations and considers themselves obligated to act according to
4 the accepted norms. The core theme of provided definitions possesses a common essence
5 arguing that individuals in a given region characterized by greater social capital are speaking
6 less selfish and agreed to fulfil their social obligations. Thus, in this study, social capital refers
7 to the situation in which individuals are willing to share their information, following the
8 designed obligations and likely cooperating. Social capital transforms a business
9 with efficiency into an innovation-driven business and a business with innovation, which may
10 also provide competitive advantages for the organization (Lauzikas and Dailydaite, 2015).
11 Social capital refers to institutions, relations, and norms and forms the quantity and quality of
12 social interaction. Social capital also improves society and the economy (Grootaert and
13 Bastelaer, 2001). Turkina and Thai (2013) suggest that social capital improves innovational
14 performance and increases knowledge and organizational learning through trust and
15 collaboration.

16 Organizations must evaluate their products and services steadily, market margin compared to
17 other organizations and emerging issues to survive in the rapidly evolving environment
18 (Sozbilir, 2018). Creativity and confidence are the main elements in such a situation (Cankar,
19 2013; Manzoor, 2014). Suebvises (2018) concluded that social networks are the main parts of
20 social capital. They improve the effectiveness of public goods provision and Thai citizens'
21 motivation to participate in public affairs. Public sector accountability is often weak in
22 Thailand, so social capital and the citizens' participation enhance the public sector's
23 performance and accountability. Companies with higher social capital pay lower audit fees (Jha
24 and Chen, 2015). These companies provide financial reports with more top qualities and have
25 fewer chances for fraud than those headquartered in lower social capital (Jha,
26 2019). Companies with high social capital perform better in times of financial crisis (Lins,
27 Servaes and Tamago, 2017). This positive effect on the performance of small and medium
28 enterprises has also been observed (Olamid and Ogbichi, 2021).

29 ***2.4. The relationship between intellectual capital and the weaknesses of internal control***

30 Among provided theories in accounting literature, we assume that the resource-based view
31 (RBV) (Barney, 1991) and dynamic capabilities theory (DCT) (Teece et al., 1997) are the most
32 applicable frameworks in explaining the association between IC and internal control
33 weaknesses. Firstly, RBV, concentrating on firms' strategic resources, may assist them in
34 creating a sustainable competitive advantage. Under such a viewpoint, strong internal controls
35 might be counted as a competitive advantage (Jokipii, 2009). The IC may play an active role
36 in establishing a strong internal control mechanism for achieving the desired competitive
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3 advantage. Furthermore, Barney (1991) believes that firms with rare, peculiar and inimitable
4 resources can perform efficiently, including establishing appropriate internal controls.
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6 Therefore, RBV suggests that firms mainly concentrate on their domestic resources comprising
7 intangible resources (such as IC) and physical capital (Kaawaase et al., 2019) rather than
8 external opportunities. Secondly, the DCT concept is developed to ensure organizations'
9 success through effectively and efficiently applying their resources in a dynamic business
10 environment (Teece et al., 1997). The turbulent and dynamic environments require
11 organizations to adopt new strategies and alter their potential resources to create or maintain
12 their competitive advantages (for example, strong internal controls), which requires greater IC
13 resources. Therefore, RBV and DCT might be considered complementary mechanisms arguing
14 that organizations are expected to respond to environmental changes by monitoring these
15 changes in the vibe and making snap changes by using IC components to strengthen their
16 capabilities in the competitive markets (Teece, 2007). Kabuye et al. (2021), examining the role
17 of IC and isomorphic forces in strengthening internal controls over financial reporting, show
18 that both intellectual capital and isomorphic pressures positively and significantly contribute
19 to the strength of internal controls. Oradi et al. (2019) argue that CEOs' financial expertise (as
20 the HC of firms) may meaningfully decline internal control weaknesses. Bananuka et al. (2019)
21 document a significant positive relationship between IC and adopting IFRS in Uganda.
22 Additionally, Salehi et al. (2020) propose that high ability managers are likely to explain the
23 investment decision making process.

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25 According to Chen, Smith, Cao & Xia (2014), intellectual capital in a firm's IT capability has
26 the additional benefits of supporting internal controls' functioning and the audit process's
27 efficiency. Similarly, Choi, Lee & Sonu (2013) indicate that human resource investment
28 determines the strength of a firm's ICFR over financial reporting (Le et al., 2020; Choi et al.,
29 2013). Contrarily, there is limited evidence on the effect of management assessments on
30 internal control quality (Schroeder and Shepardson, 2016). Nonetheless, employee treatment
31 policies influenced the integrity of internal control and financial reporting (Guo et al., 2016).
32 From the literature, we find mixed and inconsistent opinions on the influence of intellectual
33 capital on ICFR. Yet, scholars such as Bananuka et al. (2019) found intellectual capital's
34 significant and positive contribution to adopting IFRSs in Uganda's MFIs.

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36 Studies confirm employees' critical role in guaranteeing internal controls' efficiency in
37 financial reporting (Guo et al., 2016; Choi et al., 2013). The employees' maladroitness accounts
38 for almost 50 percent of internal controls (Guo et al., 2016). Companies with skilled employees
39 have fewer weaknesses in internal controls and less restatement. According to the above, there
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3 is a significant relationship between employees and their abilities as intellectual capital and
4 internal controls' weakness. Companies and their employees improve their internal controls.
5 Knowledgeable intellectual capital and its comprehensive management strengthen internal
6 controls. Companies implement intellectual capital to minimize the weaknesses of internal
7 controls. Gao et al. (2020) believe that human capital, as one of the components of intellectual
8 capital, plays an essential role in implementing accounting information systems. Human capital
9 is one of the most critical mental resources that creates the most effectiveness and efficiency
10 and has the greatest impact on company performance Yao et al., 2019). Kehelwalatenna (2016)
11 shows that intellectual capital has a controversial effect on firms' performance during financial
12 crises despite theoretical expectations. This behavior is because human capital fails to provide
13 the necessary value for the sample firms. The essential components of intellectual capital are
14 closely correlated (Dabic et al., 2019; Zhang et al., 2018). They incorporate culture, innovation,
15 and the organizational environment. Higher economic performance is positively related to
16 higher intellectual capital and innovation culture. Kengatharan (2019) confirms this by
17 demonstrating a strong relationship between intellectual capital and efficiency and a positive
18 correlation between efficiency and firm performance. Other studies (Hashim, Osman, and
19 Alhabshi, 2015; Meles et al., 2016; Handzic et al., 2016; Hamdan, Buallay and Alareeni, 2017;
20 Buallay, 2018; Ibarra Cisneros and Hernandez-Perlines, 2018; Sardo and Serrasqueiro, 2018
21 Lee and Lin, 2019; Chatterjee, 2022; Aljuboori et al., 2022) approve the positive relationship
22 between intellectual capital and its components and firm value and performance. Designing an
23 effective internal control system enhances financial performance and decreases fraud (Ibrahim,
24 Diibuzie, Abubakari, 2017). Salehi et al. (2022) and Lotfi, Salehi and Lari Dashtbayaz (2021)
25 found that increasing and improving intellectual capital decreased the likelihood of fraud.
26 So, we expect an increase in intellectual capital to improve internal controls' efficiency and
27 reduce weaknesses.

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46 In the Islamic context, scholars have attempted to identify the role of IC and social capital in
47 improving the performance and management of institutions. In this regard, Laallam et al.
48 (2020) argue the importance of IC in the performance of waqf institutions. Their paper provides
49 a platform to understand the potential obstacles and challenges in waqf institutions (such as
50 lack of accountability, lack of funding, mismanagement and lack of trained labour, among
51 others) and offers potential solutions through the consideration of knowledge and IC. It is
52 discussed that understanding the prominence of having highly capable and talented employees
53 with various expertise and mastering might be the mainstream for enhancing Islamic
54 institutions. Therefore, the HC might be counted as the main element of organizational success
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3 in operational performance and internal controls. Initially, Islamic institutions are expected to
4 create and promote an atmosphere attracting and maintains talented staff by implementing a
5 strategy to improve their performance quality; employing energetic and skilled workers may
6 strengthen the diverse organizational dimensions. Such a strategy may also optimize the
7 decision-making processes in line with the interest of the Islamic institutions and community.
8 Alternatively, it might be beneficial to preclude the loss of knowledgeable workers by
9 unnecessary turnover and showing restricted behaviour toward them (Liebowitz, 2006, 2016).

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16 Furthermore, considering the prominence of SC may encourage Islamic institutions to invest
17 heavily in IT, advanced and innovative infrastructure, security and databases, manuals and the
18 system of operating, etc. For instance, using an effective IT-based system inside an Islamic
19 institution may optimize the work process of the employees, and improve communication
20 talents and group-working and learning, resulting in enhanced performance of the affiliated
21 sectors quickly and at a minimal expense (leading cost and time effectiveness). Moreover,
22 establishing a fluent and secure infrastructure may improve the working environment in the
23 institutions and, consequently, stronger internal controls. Ali et al. (2022) indicate that green
24 human capital, structural capital and relational capital significantly influenced Islamic banks'
25 human resource (HR) management. Moreover, the outcomes of their paper recommend that
26 Islamic bank HR managers and top management should strengthen green HR management
27 policies. The Islamic bank HR department should also consider bank intellectual capital and
28 employee social identity while making environment-friendly policies.

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40 Further investigations also support the significant role of IC in business and internal control
41 improvements. Budhi and Hakim (2020) find that green human capital, structural capital, and
42 relational capital significantly impact the competitive advantage of small and medium
43 enterprises. Furthermore, Islamic business ethics only moderate the relationship between green
44 human capital and competitive advantage. In addition, corporate investment in green
45 intellectual capital is not only demanded by regulation, environmentalists, consumers,
46 competition and the government but also improves the competitive advantage of small and
47 medium enterprises. Stronger corporate governance and improved internal controls may justify
48 such associations. The Key results of Belal et al. (2019) show a significant increase in
49 intellectual capital reporting over time, the dominance of internal capital-related items in the
50 intellectual capital reporting profile and the dynamics of changes in intellectual capital
51 reporting practices over time. Through an institutional theory lens, we explain that this is due
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to the changes in the external institutional environment and various intra-organisational factors such as strong ethical culture, unique knowledge base (Sharia), and corporate governance regime. Yong et al. (2022) report that green human capital and relational capital positively influence green human resource management (HRM). In addition, green HRM is positively related to social, environmental and economic performance. Besides, green HRM positively mediates the relationships between green human capital and economic, social and environmental performance. Finally, green relational capital improves sustainability (economic, environmental, and social performance) mediated by green HRM. Karbaila et al. (2022) reveal that intellectual capital positively impacts the Maqashid Shariah Performance of Islamic banks in Indonesia; this indicates that greater utilization of intellectual capital leads to an increase in the Maqashid Shariah Performance.

According to the mentioned theoretical framework and literature reviews, the first hypothesis is as follows:

H1: Intellectual capital and internal control weakness have a significant negative relationship.

2.5. The relationship between social capital and the weakness of internal controls

Social capital allows organizations to transfer knowledge and information through relationships, enhancing individuals' abilities, competencies and skills, which benefits organizations (Burt, 1997). Under this approach, the mainstream social capital theory suggests that practitioners will likely extend their social connections to enhance performance. In this sense, Johansen and Pettersson's (2013) board coworkers might be considered a 'trustee source' for sharing information. For instance, the information sharing with external bodies may enable audit committees' members, who are accountable for the establishment of powerful internal controls, to gain further details from other firms' accounting and corporate governance practices (Reppenhagen 2010) in a timely way (Burt 1992, Horton et al. 2012). Consequently, the devastating social ties may provide a firm with effective corporate governance structures and internal controls through efficient information transferring and learning from social networks, which might not be observable in other manners (Kim 2005, Stuart and Yim 2010). In addition, audit committee or board of director members who are engaged in the operation of several firms are exposed to a broader accounting, corporate governance and strategic manners (Vafeas, 1999, Kor and Sundaramurthy, 2009), which in turn enables them to internalize the processes and transfer their valuable experiences across their social ties (Useem 1984; Beckham and Haunschild, 2002). In the context of interrelationships and open collaboration, it is argued that social networks are likely to strengthen internal controls and the quality of

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3 financial reports (Hoitash, 2011). Salehi et al. (2019) argue that environmental issues, such as
4 the regional financial crisis, may also explain the quality of audited financial reports.
5 Collectively, it is observed that the critical opportunity proposed by social capital might be
6 knowledge creation and transference across the social networks by individual employees of
7 organizations.
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11 The lack of qualified accounting and technical expertise personnel often contributes
12 inefficiently to the effect of internal controls on financial reporting (Gao et al., 2020). Studies
13 indicate that material weaknesses are related to firms with incompetent personnel (Choi et al.,
14 2013; Doyle, Ge, and Mcvay, 2007). There is a significant relationship between the factors and
15 their impact on business and the final value in a knowledge-based economy (Unerman and
16 Guthrie, 2008). Firms grow by employing talented and innovative staff. Improving staff
17 knowledge and efficiencies also enhances the employees' and managers' trust and
18 collaboration. This, in turn, improves the weakness of internal controls. Guo et al. (2016) show
19 that companies with employee-friendly policies have fewer weaknesses in internal controls.
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21 Organizations seek to improve their staff's confidence and creativity (Foster and Kaplan.,
22 2011). Social capital affects organizational creativity, and this creativity affects organizational
23 efficiency (Sozibilir, 2018). A creative organization's primary income source is new products
24 to overcome problems (Andriopoulos, 2000). These organizations inspire employees to
25 participate in creative processes and provide novel ideas distinct from current products (Jaussi
26 and Randel, 2014). Perry-Smith (2006) found that weak associations in social networks
27 decrease creativity, and better interaction among employees increases (Hsu and Fan, 2010;
28 Hunter, Bedell and Mumford, 2007). The positive impact of an employee's quality on internal
29 controls' efficiency is higher in companies with better external monitoring (Liu, Lin, and Shu,
30 2017). Corporate social responsibility enhances financial performance, reduces asymmetric
31 information, develops access to financial resources, and improves internal controls (Kim, Kim,
32 and Kim, 2017). Also, Salehi et al. (2022) found a significant negative relationship between
33 social capital and financial statement fraud. Wang et al. (2018), assessing the impact of
34 mandatory corporate social responsibility reporting on firms' financial reporting quality, find
35 that mandatory corporate social responsibility disclosure firms constrain earnings management
36 after the policy. They argue that mandatory corporate social responsibility disclosure mitigates
37 information asymmetry by improving financial reporting quality. Darlene (2018) believes that
38 social capital should be considered the sixth rationale for board diversity; social capital serves
39 a role in governance and rises to the standard of other rationales for board diversity. Habib and
40 Mostafa (2017) document that firms from a high social capital county hold significantly less
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3 cash than firms from a low social capital county. They also show that social capital reduces
4 cash holdings via the financial constraints and financial reporting quality channels while it
5 increases cash holdings via the systematic and idiosyncratic risk channels. Additional analysis
6 reveals that the effect of social capital on cash holdings is more pronounced for less
7 geographically dispersed firms.
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12 Juan et al. (2022) find a negative association between social capital and earnings management.
13 Meaning managers of small and medium firms headquartered in regions of higher social capital
14 are less likely to manage reported earnings. Their findings imply the effective role of social
15 capital in strengthening internal controls. Abed et al. (2022) show the significant impacts of
16 corporate social responsibility in moderating the relationship between the determinants of
17 creative accounting and the financial reporting quality of banks towards competitive
18 advantages. Avishek et al. (2022) document that collaboration- (competition-) oriented culture
19 firms have lower (higher) financial reporting quality, and these effects are incremental to
20 corporate governance and tone at the top. Further analyses support our main findings and
21 suggest that collaboration culture is associated with the likelihood of reporting a material
22 internal control weakness, while competition culture is related to a lower likelihood of an
23 internal control weakness and a restatement. Ho et al. (2022) reveal that banks with stronger
24 engagements and interests in the business-related CSR domain experience higher profitability,
25 while those more committed to the corporate governance and charity-related domains create
26 larger social contributions. Banks tend to incur higher CSR spending when more active in
27 corporate governance. Although the stock market reacts positively to CSR expenditures, the
28 reaction is less favorable for banks with CSR expenditures above the industry norm.
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41 Considering the above discussions, we expect that improved social capital may reduce the
42 weaknesses of internal controls. According to the mentioned research foundations and
43 literature reviews, the second hypothesis is developed as follows:
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46 **H2:** Social capital and internal control weaknesses have a significant negative relationship.
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50 **Insert Figure 1 here**
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53 **3. Research methodology**

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55 This study is practical regarding the purpose and correlational regarding the information
56 analysis. The research's statistical population includes all listed companies on the Tehran Stock
57 Exchange from 2014 to 2020. The following table demonstrates the criteria for choosing the
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sample data. After applying restrictions, the statistical sample of 187 companies listed on the TSE was determined.

Insert Table 1 here

3.1. Data Collection Methods and Instruments

The data were collected from the following. The resources include RahavardNovin Software, financial statements, notes to the financial statements, general assembly minutes, disclosed reports of internal controls' weaknesses, and independent audit reports from the Codal Website. The Stata-Test was used to analyze the data.

3.2. Data analysis method

The F-Limer test is used to estimate the panel model. The Hausman test is used to identify the random effects of fixed effects. Multivariate Regression, Least Square Regression, and Fixed Effects regression test the research hypotheses. The Kolmogorov-Smirnov test for normality of the data, the Collinearity, and sensitivity analysis is also applied.

3.3. The research model

$$CI = \alpha_0 + \alpha_1 INCAP + \alpha_2 SOC + \alpha_3 AIS + \alpha_4 BSF + \alpha_5 BSI + \alpha_6 AGE + \alpha_7 SIZE + \alpha_8 LEV + \alpha_9 ROA + \alpha_{10} LOSS + \alpha_{11} MTB + \alpha_{12} BLND + \alpha_{13} BE + \alpha_{14} BUSY + \alpha_{15} INDUSTRY + \alpha_{16} YEAR + \varepsilon_0$$

Dependent variable:

The audit report used the three variables of internal financial control weakness, non-financial weakness and information technology to measure the internal control weakness (Salehi, Rajaei and Edalati Shakib, 2021).

Independent variable:

Pulic's (2000; 2004) models have been used to measure intellectual capital, the method of which is fully described in the appendix.

Insert Table 2 here

To measure our social capital, the Legatum Prosperity Index has been used, published annually by the Legatum Research Institute (Salehi et al., 2022). The Legatum Institute reports its specific annual index, which declares prosperity over countries measured by wealth and life satisfaction criteria. The employed criteria by Legatum are economic quality, business environment, governance, education, health, safety & security, personal freedom, social capital and natural environment. One of them is the social capital ranking used in this paper.

Control variables

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3 In the present study, according to Salehi, Rajaei and Adalati Shakib (2021); Salehi and
4 Ghasempour (2021); Oradi, Asian and Rezaei (2019), BSF variables. BSI, AGE, SIZE, LEV,
5 ROA, LOSS, MTB, BLND, BE, BUSY) control variables.

6
7
8 Doyle, Jay & McVeigh (2007) showed that smaller, younger and less profitable companies
9 have more internal control weaknesses. Companies with weak internal control systems have
10 higher losses and lower ROAs (Ghosh and Lee, 2013). In contrast, Oussii and Boulila Taktak
11 (2018) showed that larger companies are usually more likely to have problems with the internal
12 control system due to the complexity of operations and wider scope. In addition, firms with
13 strong corporate governance are less likely to have problems with the internal control system.
14 The number of board and audit committee meetings reflects the board's efforts to identify and
15 address weaknesses in the internal control system. Audit committee and board structure affect
16 the quality of internal control systems (Hoitash, Hoitash and Bedard, 2009) and companies
17 with independent boards encounter less internal control weakness (Chen et al., 2017b).

25 **4. Data analysis**

26 **4.1. Descriptive statistics**

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28
29 **Insert table 3 here**

30
31 According to the descriptive statistic in Table 2, it is observed that about 23 percent of the
32 organizations have weaknesses in their internal controls. To measure this weakness, the
33 following were used. The variables are IT weaknesses and financial and non-financial
34 weaknesses. The maximum and minimum (its factor variable includes human capital, structural
35 capital and customer capital) of intellectual capital are 5,782 and -5,314. The maximum and
36 minimum amounts of social capital are 121 and 55. This variable's occurrences are less than
37 other variables due to lack of disclosure and lack of access to the (BSI) board specialization
38 industry variable.

39 **4.2. The results of the unit root test of variables**

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41 The stationary of variables is one of the essential features of data. The stationary of variables
42 avoids false regression between the variables. Their stationary status must be determined before
43 model evaluation to ensure data are not fabricated. The Hadri Test is used for this purpose.
44 According to Appendix 1, the unit root for all the variables is stationary.

45 **4.3. Kolmogorov test results**

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47 The Kolmogorov test is used to determine the data normality. We test the null hypothesis H0
48 at the error level of 5 percentage percent. If the test statistic is greater than or equal to 5 percent,
49 there is no reason to reject the H0, and the data are normal. The results are reported in Appendix
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4.4. *Collinearity test*

The variance inflation factor test is used to assess the multicollinearity issue. The results in Appendix 3 show that variables are not suffering from the multicollinearity problem since the results are less than 10.

4.5. *Sensitivity test*

The sensitivity analysis is applied to figure out the direct association between variables regardless of the regression model, in which the affiliated results are reported in Appendix 4.

4.6. *Regression tests*

Insert Table 4 here

Insert Table 5 here

Insert Table 6 here

Insert Table 7 here

The hypothesis test results in Table 4 show a negative and significant relationship between intellectual capital and social capital. The p-value for each is 0,001 and 0,018, lower than 0.05. The variable coefficients are $-0,027$ and $0,000$, indicating an indirect relationship between intellectual capital, social capital, and internal control weaknesses. Because the variable coefficient for intellectual and social capital is -0.020 and 0.002 at the significance level of 90 percent. Table 7 shows a reduction in internal control weaknesses because the intellectual and social capital significance level is lower than 0.05, with 0.024. The variables coefficient is -0.165 and 0.036 , indicating an inverse relationship between variables and internal control weaknesses in the next year.

4.7. *further findings*

Insert Table 8 here

Insert Table 9 here

Insert Table 10 here

Insert Table 11 here

Table 8 shows a significant and inverse relationship between the variables and the non-financial weaknesses in internal controls. Its significance level is less than 5 percent and is 0,005. According to the regression, the independent variable coefficient is -0.014 and $0,058$. Tables 9 and 10 confirm the Last Square and fixed-effects regression results. The variable coefficient of intellectual and social capital in the last square regression and fixed effects are, respectively, -0.007 , -0.018 , -0.001 , and -0.009 . The p-value for each is less than 5 percent and is 0.004, 0.002, 0.004, and 0.025. Other study results denote an inverse and negative relationship

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3 between the intellectual capital and social capital and the non-financial weaknesses of internal
4 control for the upcoming year of the organizations and confirm the results of Table 11.

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6 **Insert Table 12 here**

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8 **Insert Table 13 here**

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10 **Insert Table 14 here**

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12 **Insert Table 15 here**

13 Table 12 demonstrates that, as expected, there is a significant and negative relationship between
14 the IT weaknesses of internal control and intellectual and social capital. The p-value is 0.000
15 and lower than 0.05. The p-value of the mentioned variables in the least square regression and
16 fixed effects in Tables 13 and 14 confirms this relationship. Their p-value is 0.000 and 0.018,
17 and the variable coefficient is -0.018 and -0.0522. Their variable coefficient is - 0.010 and
18 0.093. The T+1 regression results in Table 18 denote that improving social and intellectual
19 capital reduces the weakness of internal controls related to computers in the coming year. The
20 variable coefficient for intellectual and social capital is -0.010 and -0.099, with a p-value of
21 0.006 and 0.00 in Table 15.

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23 **Insert Table 16 here**

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25 **Insert Table 17 here**

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27 **Insert Table 18 here**

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29 **Insert Table 19 here**

30 Table 16 demonstrates the main regression results. It denotes an indirect and significant
31 relationship between the financial weaknesses of internal control, intellectual capital, and social
32 capital. Their p-value is 0.005 and 0.000, which is lower than 0.05 percent. The coefficient for
33 each is -0.058 and -0.002, confirming the above relationship. The fixed-effects regression and
34 the last square tests are conducted to ensure the results. Their results in Tables 17 and 18
35 establish the mentioned relationship. As shown in Table 19, the variables' analysis shows that
36 enhancing intellectual and social capital quality reduces internal controls' financial weaknesses
37 in the coming year. Their p-value is 0.002 and 0.003, respectively, less than the significance
38 level of five percent. The variable coefficient is -0.055 and -0.002, confirming the inverse
39 relationship.

40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 **5. Discussion**

56 The internal control system's inability to provide adequate supervision would lead to
57 inefficiency, a decline in investors' and beneficiaries' trust and increased dissatisfaction,
58 causing the firm's low valuation from the market's side (Hammersley, Myers & Shakespeare,
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2008). One factor contributing to internal control weakness and, subsequently, the quality of internal controls is firms' intellectual capital. Several studies also showed that inefficient internal controls mainly relate to personnel (Doyle, Ge and McVay, 2007). Moreover, Choi et al. (2013) and Gao et al. (2020) believe that inefficient internal controls are related to a lack of experienced personnel in the accounting, sufficient technical expertise, and disqualification. According to these factors, firms are searching for competent accountants and analytical staff who have perseverance and innovative thoughts, humanitarian relations, and transfer confidence to others to elevate internal controls' efficiency and cause the decline of weakness in internal controls. The first hypothesis results align with Guo et al. (2016), who indicate that high-quality firms do not have severe internal control weaknesses. The results of Gao et al. (2020) conform with Liu, Lin, and Shu (2017) declare that staff quality can improve the effectiveness of internal controls of firms and that the positive impact of staff quality on internal control effectiveness in firms with external supervision is more than other firms.

6. Conclusion

The study's first hypothesis results show a negative and significant relationship between intellectual capital and internal control weaknesses, which means the presence of more experienced and skilled intellectual capital in the firms leads to the decline of internal control weaknesses. According to the RBV, more intellectually skilled human resources are willing to benefit organizations with competitive advantages. Strong internal controls might be counted as an effective competitive advantage. Moreover, the DCT suggests that in changeable current business environments, acquiring sufficient knowledge and adequate internal infrastructures is critical in showing quick and suitable responses to the dynamic nature of markets. Thus, having talented, skillful, knowledgeable and experienced human resources will likely reduce internal control weaknesses.

As for the second hypothesis, it is believed that there is a negative and significant relationship between social capital and internal control weakness, which means the higher the social capital of firms, the less the weakness in internal controls. As discussed earlier, it is expected that the wider social ties may provide organizations with the opportunity of gaining further knowledge from employees who are working in several companies and are likely to experience more, as well as transferring the knowledge that is already generated in other companies located in the region of social connection. Therefore, more social capital is likely to benefit companies in tackling internal control weaknesses by generating and transferring knowledge to the organizations. Further, the study's findings show increased quality and intellectual improvement by analyzing intellectual capital's and social capital's effects on internal control

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3 components. Social capital in organizations will lead to declining organizational internal
4 control weaknesses. In the upcoming years, we will witness intellectual and social capital's
5 effectiveness and positive effect on reducing internal control weaknesses.
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8 According to the findings of this paper, some contributions are recommendable for investors,
9 managers and policymakers. Investors might benefit from improving the IC and social capital
10 as two crucial intangible assets for organizational success. In particular, investment in these
11 two critical factors, prominently in the knowledge-based economies, is willing to compensate
12 its potential costs in current and subsequent years through the strength of internal control
13 weaknesses. To make it more apparent, employing highly skilled staff, improving workers'
14 knowledge and implementing fluent and secure structures and processes will likely benefit the
15 organizations through stronger internal controls. Also, such an effect might be more
16 pronounced in Islamic societies by Islam's teachings promoting social interactions,
17 cooperation and knowledge sharing to expand social justice. Bataineh et al. (2022) argue that
18 intellectual capital efficiency, particularly human capital, is a critical factor enabling firms to
19 achieve higher financial performance and market value. In a more detailed context, Laallam et
20 al. (2022) show that human capital, structural capital and spiritual capital play an allocative
21 role in determining the success of waqf institutions in Algeria. Moreover, managers are aware
22 that increasing their social ties and connections might also be counted as an advantage for them
23 against the principals since the principals are known that managers having further social
24 connections are likely to have more valuable experiences and further knowledge resources to
25 transfer into the organizations, both of which are applicable in the reduction of internal control
26 weaknesses. In other words, managers and board members are aware that the built social
27 reputation among the Islamic communities in Iran may significantly assist them in receiving
28 the latest knowledge of their industrial domain, which might be applicable to improve internal
29 controls. In other words, it is expected that the strong internal controls might be considered a
30 result of Islamic communities' requirements from the companies and their managers.
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33 Furthermore, policymakers can improve the efficiency of financial markets by recommending
34 facilities for companies, such as investment in intangible assets and IC components. They may
35 recompense some of the costs of IC investments to reduce the potential risks of such long-run
36 viewpoints. In particular, enforcement of disclosing the IC performance and collecting and
37 maintaining the social capital databases might be among the beneficial strategies that
38 policymakers may use to improve internal controls and market efficiency. Finally,
39 macroeconomic analysts may also achieve better predictions regarding the provided high-
40 quality financial reports under strong internal control mechanisms (Salehi et al., 2021);
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Daemigah, 2020). The high-quality prepared financial reports, as a result of investment in IC and social capital, are expected to assist the government in receiving accurate and reliable information regarding the financial markets.

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Figure 1.
The relationship between variables and applied theories

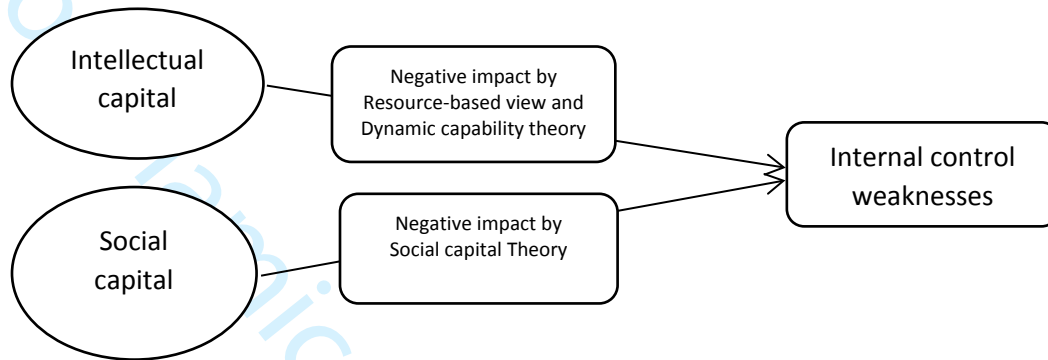


Table 1.
The number of firms in the statistical population

Description	Eliminated firms in total periods	Total No. of firms
Total listed firms on the Tehran Stock Exchange		445
Eliminating financial intermediaries, financial supply, insurance, and investment firms	88	
Firms with more than six months of transaction halt	111	
Eliminating firms that entered the Stock Exchange during the study period	57	
Eliminating lack of access to information	113	
Statistical population		187

Table 2.
Variable description

Variable	Type	Definition
CI	Dependent variable	IT Material Weakness: if there is a weakness in the audit report, it equals one; otherwise, zero. ICWF: if there is a financial weakness in the audit report, it equals one and, otherwise, zero. ICWOF: If the audit report has a non-financial weakness, it equals one; otherwise, zero.
Intellectual capital	Independent variable	Intellectual Capital. The model of Pulic (2000:2004) measures intellectual capital components. VA = out – in Value Added = outputs - inputs The salary and wage expenses are not included in this model's input because of human capital's active role in creating value. VA = OP + EC + D + A

		<p>Value Added = intangible assets depreciation + fixed asset depreciation + cost of intellectual capital / intellectual capital expense + organizational profit</p> <p>HCE= VA ÷ HC human capital efficiency = value-added ÷ human capital</p> <p>Human capital includes costs of direct and indirect wages/direct and indirect wage expenses, marketing, sales, and office sectors wage expenses</p> <p>Structural Capital =SC</p> <p>SC= VA-HC structural capital = value-added – human capital</p> <p>SCE= SC ÷ VA Structural Capital efficiency = structural capital ÷ value-added</p> <p>Nazari (2010) states that structural capital includes customer capital and Organizational capital, according to Edvinsson and Molone's (1997) model.</p> <p>SC=CC+OC</p> <p>CC= Customer Capital</p> <p>OC= Organizational capital</p> <p>In order to calculate the customer and organizational capital, the following are used</p> <p>CC= Marketing Cost</p> <p>CCE= CC/VA</p> <p>OC= Innovation capital + Process Capital</p> <p>Inc= Research and development expenditure</p> <p>Pc= Sc- Cc- Inc</p>
Soc	Independent variable	Social capital. Iran's social capital ranking (Legatum index) is used.
AIS	Control	<p>the model of Habib and Bhuiyan (2011) is used to calculate an auditor's specialization</p> $\frac{\text{total assets of all the employers in every audit institution in an specialized industrty}}{\text{total assets of all the employers in an specialized industry}}$ <p>The audit institutions' industry specialisation is confirmed if the above equation's result is higher than 1.2 (the number of companies). So the specialized institutions equal one, and other institutions equal zero</p>
BSF	Control	If at least one of the board members has a relevant degree in financial fields such as accounting, economy, and business management, it equals one; otherwise, zero.
BSI	Control	If at least one board member has a relevant degree in one of the related industries, it equals one; otherwise, zero.
AGE	Control	Equals the years from the date of company establishment to the present year
Size	Control	The logarithm of total assets at the end of the fiscal year.
LEV	Control	The total debt to the total assets of the company.
ROA:	Control	Return on Assets is calculated by dividing the net income by the company's total assets.
MTB:	Control	The market value ratio to the book value of the shareholder's equity in the current year.
LOSS	Control	If the firm is at a loss during the current year, it equals one; otherwise, zero.
BLND:	Control	Equals the ratio of responsible managers to non-responsible managers.
BE	Control	Equals the number of board meetings during the current year.

BUSY	Control	If the fiscal year corresponds to March 20, it equals one; otherwise, zero.
Industry:	Control	Dummy industry variable.
Year:	Control	Dummy year variable.

Table 3.
Descriptive statistics of the variables

variable	obs	Mean	Std. dev	Min	Max
CI	1301	0.232	0.231	0	0.828
ICWF	1301	0.716	0.450	0	1
ICWOF	1301	0.933	0.249	0	1
ICWIT	1301	0.162	0.369	0	1
INCAP	1297	1.594	0.515	-5.314	5.781
SOC	1309	95.285	25.592	55	121
AIS	1309	0.433	0.495	0	1
BSF	1277	0.946	0.224	0	1
BSI	1192	0.890	0.311	0	1
AGE	1309	39.301	13.185	8	67
SIZE	1309	14.301	1.542	10.532	19.773
LEV	1309	0.612	0.270	0.061	4.002
ROA	1308	0.214	2.207	-72.695	10.045
LOSS	1307	0.139	0.346	0	1
MTB	1300	4.265	6.016	-59.594	53.464
BLND	1307	0.693	0.199	0	1.166
BUSY	1309	0.684	0.464	0	1
BE	1306	14.661	5.238	5	50

Table 4.
The results of the model

variable	Coef	Std.Err	Z	p-value
Cons	-2.730	0.327	-8.34	0.000***
Incap	-0.027	0.008	-3.21	0.001***
Soc	-0.000	0.000	-2.36	0.018**
Ais	-0.013	0.006	-1.96	0.050**
Bsf	-0.121	0.038	-3.16	0.002***
Bsi	0.098	0.032	3.01	0.003***
Age	0.045	0.005	7.74	0.000***
Size	0.084	0.027	3.12	0.002***
Lev	0.014	0.005	2.63	0.008***
Roa	-0.203	0.007	-25.66	0.000***
Loss	-0.037	0.026	-1.41	0.160
Mtb	0.006	0.002	2.72	0.006***
Blnd	0.154	0.051	3.02	0.003***
Busy	0.033	0.013	2.53	0.020**
Be	-0.184	0.018	-9.74	0.000***
Weighted Statistics				
R Squared	0.2853			
Adjusted R-Squared	0.0194			
F(13,952)	29.22			
Prob(F Statistic)	0.000***			
F_Limer	F(181,951)= 1.76			
	0.000***			

<i>Hasman</i>	Chi2(13)= 208.15
	0.000***

Note: ***,** and* denote significance at 99%,95% and 90% respectively

Table 5.

The results of the model by Least Square Regression

variable	Coef	Std.Err	z	p-value
Cons	0.240	0.099	2.42	0.016**
Incap	-0.031	0.012	-2.47	0.014**
Soc	-0.002	0.000	-9.01	0.000***
Ais	-0.004	0.001	-2.94	0.003***
Bsf	-0.054	0.027	-1.95	0.051*
Bsi	0.038	0.020	1.85	0.064*
Age	0.001	0.000	2.62	0.009***
Size	0.015	0.005	2.94	0.003***
Lev	0.061	0.026	2.34	0.019**
Roa	-0.000	0.000	-2.04	0.041**
Loss	-0.073	0.020	-3.51	0.000***
Mtb	0.002	0.001	2.17	0.030**
Blnd	0.050	0.035	1.41	0.159
Busy	0.079	0.029	2.73	0.006***
Be	-0.001	0.001	-1.26	0.206
Weighted Statistics				
Number of obs	1147			
R Squared	0.6749			
Adjusted R-Squared	0.6673			
P-value	F(14,1132)= 12.50			
	0.000***			

Note: ***,** and* denote significance at 99%,95% and 90% respectively

Table 6.

The results of the model by fixed effects

variable	Coef	Std.Err	z	p-value
Cons	0.240	0.086	2.78	0.005***
Incap	-0.020	0.009	-2.18	0.029*
Soc	-0.002	0.000	-11.80	0.000***
Ais	-0.013	0.004	-2.81	0.005***
Bsf	-0.054	0.027	-1.97	0.049*
Bsi	0.038	0.018	2.10	0.036**
Age	0.001	0.000	2.98	0.003***
Size	0.015	0.004	3.36	0.001***
Lev	0.061	0.029	2.13	0.033**
Roa	-0.030	0.017	-1.75	0.081*
Loss	-0.073	0.018	-4.05	0.000***
Mtb	0.002	0.001	2.25	0.025**
Blnd	0.050	0.035	1.40	0.160
Busy	0.006	0.002	2.72	0.006***
Be	-0.001	0.001	-1.24	0.215
Weighted Statistics				
Number of obs	1147			
R Squared	0.1601			
Adjusted R-Squared	0.0323			
P-value	Chi2(14) = 445.85			
	0.000***			

Note: ***,** and* denote significance at 99%,95% and 90% respectively

Table 7.
Results of the model for T+1

variable	Coef	Std.Err	Z	p-value
Cons	-4.350	0.555	-7.83	0.000***
Incap	-0.165	0.073	-2.26	0.024**
Soc	-0.036	0.016	-2.27	0.024**
Ais	-0.003	0.001	-1.91	0.057*
Bsf	-0.173	0.060	-2.85	0.004***
Bsi	0.152	0.050	3.03	0.003***
Age	0.026	0.009	2.90	0.004***
Size	0.190	0.044	4.24	0.000***
Lev	0.004	0.000	4.49	0.000***
Roa	0.055	0.025	2.19	0.029**
Loss	0.029	0.048	0.60	0.551*
Mtb	0.004	0.002	2.30	0.022**
Blnd	0.254	0.080	3.17	0.002***
Busy	0.004	0.000	9.93	0.000***
Be	-0.353	0.050	-6.97	0.000***
Weighted Statistics				
R_Squared	0.2132			
Adjusted R-Squared	0.0083			
P_value	F(13,783)=16.32			
	0.000			

Note: ***,** and* denote significance at 99%,95% and 90% respectively

Table 8.
Multiple Linear Regression (Non-financial internal control weakness)

variable	Coef	Std.Err	Z	p-value
Cons	0.093	0.121	7.72	0.000***
Incap	-0.014	0.005	-2.80	0.005***
Soc	-0.058	0.020	-2.80	0.005***
Ais	-0.033	0.006	-5.04	0.000***
Bsf	-0.000	0.000	-2.27	0.023**
Bsi	0.012	0.006	1.90	0.057*
Age	0.003	0.000	9.62	0.000***
Size	0.018	0.003	5.01	0.000***
Lev	0.054	0.029	1.82	0.069*
Roa	-0.015	0.011	-1.37	0.171*
Loss	0.047	0.015	3.03	0.002***
Mtb	-0.002	0.001	-1.33	0.183*
Blnd	0.069	0.026	2.66	0.008***
Busy	0.003	0.001	2.02	0.043**
Be	-0.665	0.316	-2.10	0.036**
Weighted Statistics				
R_Squared	0.0111			
Adjusted R-Squared	0.0358			
Wald chi2(14)	21.34			
Prob(F_Statistic)	0.0932			
F_Limer	F(181,952)= 2.51			
	0.000			
Hausman	Chi2(13)= 3.80			

0.9932

Note: ***, ** and* denote significance at 99%,95% and 90% respectively

Table 9.**Least Square Regression (Non-financial internal control weakness)**

variable	Coef	Std.Err	z	p-value
Cons	0.956	0.110	8.65	0.000***
Incap	-0.007	0.002	-2.93	0.004***
Soc	-0.018	0.005	-3.09	0.002***
Ais	-0.096	0.014	-6.53	0.000***
Bsf	-0.007	0.002	-2.93	0.004***
Bsi	0.078	0.033	2.31	0.021**
Age	0.084	0.023	3.65	0.000***
Size	0.006	0.002	2.48	0.013***
Lev	0.051	0.030	1.70	0.089*
Roa	-0.021	0.014	-1.48	0.139*
Loss	0.039	0.024	1.64	0.101*
Mtb	-0.002	0.001	-2.00	0.045**
Blnd	-0.053	0.040	-1.31	0.191*
Busy	0.009	0.003	2.86	0.004***
Be	-0.076	0.041	-1.84	0.066*
Weighted Statistics				
Number of obs	1147			
R Squared	0.6849			
Adjusted R-Squared	0.5393			
P-value	F(14,1132)= 1.63			
	0.0662			

Note: ***, ** and* denote significance at 99%,95% and 90% respectively

Table 10.**Fixed effects Regression (Non-financial internal control weakness)**

variable	Coef	Std.Err	z	p-value
Cons	0.748	0.353	2.11	0.035**
Incap	-0.001	0.000	-2.85	0.004***
Soc	-0.009	0.004	2.25	0.025**
Ais	-0.001	0.000	-2.85	0.004***
Bsf	-0.026	0.013	-1.87	0.061*
Bsi	0.004	0.000	4.49	0.000***
Age	0.026	0.009	2.88	0.004***
Size	0.026	0.029	0.91	0.365*
Lev	0.077	0.044	1.73	0.084*
Roa	-0.093	0.024	-3.86	0.000***
Loss	0.054	0.028	1.90	0.058*
Mtb	-0.001	0.001	-1.21	0.225*
Blnd	0.024	0.008	2.90	0.004***
Busy	0.022	0.012	1.78	0.075*
Be	-0.294	0.131	-2.24	0.025**
Weighted Statistics				
Number of obs	1147			
R Squared	0.0125			
Adjusted R-Squared	0.5720			
P-value	F(13,952)=0.93			
	0.5232			

Note: ***, ** and* denote significance at 99%,95% and 90% respectively

Table 11.
The results of T+1

variable	Coef	Std.Err	Z	p-value
Cons	-0.046	0.087	-0.53	0.597*
Incap	-0.073	0.033	-2.18	0.030**
Soc	-0.068	0.034	-1.96	0.050**
Ais	-0.026	0.017	-1.55	0.122*
Bsf	-0.003	0.012	-1.92	0.054*
Bsi	0.026	0.008	3.09	0.002***
Age	0.086	0.028	3.00	0.003***
Size	0.008	0.004	1.92	0.055*
Lev	0.004	0.001	3.21	0.002***
Roa	-0.004	0.002	-1.66	0.097*
Loss	0.011	0.005	1.99	0.047**
Mtb	-0.000	0.001	-0.44	0.663*
Blnd	0.003	0.001	2.15	0.032**
Busy	0.015	0.008	1.96	0.050**
Be	-0.003	0.001	-2.11	0.035**
Weighted Statistics				
R_Squared	0.0064			
Adjusted R-Squared	0.0454			
Wald chi2(14)	9.00			
Prob(F Statistic)	0.8310			

Note: ***,** and* denote significance at 99%,95% and 90% respectively

Table 12.
Multiple Linear Regression (IT internal control weakness)

variable	Coef	Std.Err	Z	p-value
Cons	-1.111	0.509	-2.18	0.029**
Incap	-0.010	0.002	4.86	0.000***
Soc	-0.093	0.024	-3.81	0.000***
Ais	-0.009	0.004	2.02	0.045**
Bsf	-0.001	0.000	-2.18	0.029**
Bsi	0.003	0.000	9.62	0.000***
Age	0.020	0.010	1.97	0.049**
Size	0.054	0.042	1.29	0.198*
Lev	0.002	0.001	1.90	0.057*
Roa	0.012	0.006	2.02	0.044**
Loss	-0.000	0.000	-1.75	0.083*
Mtb	0.085	0.029	2.89	0.004***
Blnd	0.001	0.000	2.63	0.009***
Busy	-0.003	0.001	-2.18	0.030**
Be	-0.026	0.013	-1.87	0.061*
Weighted Statistics				
R Squared	0.0169			
Adjusted R-Squared	0.5107			
P_value	F(13,952)=1.26			
	0.2311			
F_Limer	F(181,952)= 2.42			
	0.000			
Hausman	Chi2(13)= 23.65			
	0.0346			

Note: ***,** and* denote significance at 99%,95% and 90% respectively

Table 13.

Least Square Regression (IT internal control weakness)

variable	Coef	Std.Err	z	p-value
Cons	0.295	0.158	1.87	0.062*
Incap	-0.018	0.003	-5.01	0.000***
Soc	-0.522	0.221	-2.36	0.018**
Ais	-0.002	0.000	-3.71	0.000***
Bsf	-0.073	0.030	-2.37	0.018**
Bsi	0.060	0.034	1.77	0.076*
Age	0.001	0.000	1.66	0.098*
Size	-0.017	0.008	-2.05	0.041**
Lev	0.058	0.043	1.35	0.177*
Roa	-0.014	0.005	-2.80	0.005***
Loss	-0.039	0.034	-1.16	0.248*
Mtb	0.002	0.001	1.05	0.293*
Blnd	0.092	0.022	4.05	0.000***
Busy	-0.092	0.024	-3.85	0.000***
Be	-0.033	0.006	-5.04	0.000***
Weighted Statistics				
Number of obs	1147			
R Squared	0.4318			
Adjusted R-Squared	0.4206			
P-value	F(14,1132)= 2.62			
	0.0010			

Note: ***, ** and* denote significance at 99%,95% and 90% respectively

Table 14.**Fixed effects Regression (IT internal control weakness)**

variable	Coef	Std.Err	z	p-value
Cons	0.150	0.205	0.73	0.464*
Incap	-0.016	0.006	-2.43	0.015***
Soc	-0.100	0.027	-3.68	0.000***
Ais	-0.024	0.014	-1.72	0.089*
Bsf	-0.017	0.010	-1.67	0.095*
Bsi	0.047	0.036	1.29	0.198*
Age	0.001	0.001	1.51	0.132*
Size	0.005	0.002	2.44	0.015***
Lev	0.006	0.001	3.53	0.000***
Roa	0.021	0.007	3.05	0.002***
Loss	-0.372	0.171	-2.17	0.030**
Mtb	0.007	0.004	1.90	0.058**
Blnd	0.012	0.004	2.91	0.004***
Busy	-0.084	0.037	-2.22	0.026**
Be	-0.207	0.105	-1.98	0.049**
Weighted Statistics				
Number of obs	1147			
R Squared	0.0066			
Adjusted R-Squared	0.4667			
P-value	Chi2(14) = 19.93			
	0.1323			

Note: ***, ** and* denote significance at 99%,95% and 90% respectively

Table 15.

The results of the model for T+1

variable	Coef	Std.Err	Z	p-value
Cons	-2.621	0.798	-3.28	0.001***
Incap	-0.010	0.003	-2.75	0.006***
Soc	-0.099	0.027	-3.61	0.000***
Ais	-0.035	0.017	-2.00	0.046**
Bsf	-0.130	0.041	-3.14	0.002***
Bsi	0.015	0.004	3.58	0.000***
Age	0.003	0.001	2.04	0.043**
Size	0.135	0.064	2.10	0.036**
Lev	0.006	0.002	2.72	0.006***
Roa	0.041	0.036	1.13	0.258*
Loss	-0.221	0.105	-2.10	0.036**
Mtb	0.003	0.002	1.21	0.226*
Blnd	0.029	0.008	3.42	0.001***
Busy	-0.023	0.013	-1.71	0.087*
Be	-0.244	0.092	-2.64	0.008***
Weighted Statistics				
R_Squared	0.0295			
Adjusted R-Squared	0.6428			
P-value	F(13,783)= 1.83			
	0.0348			

Note: ***,** and* denote significance at 99%,95% and 90% respectively

Table 16.**The results of the main model (Financial internal control weakness)**

variable	Coef	Std.Err	Z	p-value
Cons	2.430	0.554	4.39	0.000***
Incap	-0.058	0.020	-2.80	0.005***
Soc	-0.002	0.000	-4.27	0.000***
Ais	-0.129	0.056	-2.28	0.023**
Bsf	-0.131	0.065	-2.00	0.046**
Bsi	0.100	0.056	1.78	0.075*
Age	-0.031	0.009	-3.17	0.002***
Size	-0.137	0.008	-16.74	0.000***
Lev	0.144	0.069	2.06	0.039**
Roa	-0.047	0.023	-2.01	0.044**
Loss	0.028	0.014	2.04	0.042**
Mtb	-0.006	0.002	-2.88	0.004***
Blnd	0.128	0.087	1.47	0.143*
Busy	0.143	0.055	2.61	0.010***
Be	-0.010	0.002	4.86	0.000***
Weighted Statistics				
R_Squared	0.0804			
Adjusted R-Squared	0.5226			
P_value	F(13,952)=6.40			
	0.000			
F_Limer	F(181,952)= 4.11			
	0.000			
Hausman	Chi2(13)= 38.73			
	0.0002			

Note: ***,** and* denote significance at 99%,95% and 90% respectively

Table 17.
Least Square Regression (Financial internal control weakness)

variable	Coef	Std.Err	z	p-value
Cons	0.232	0.189	1.22	0.221*
Incap	-0.007	0.002	-2.93	0.000***
Soc	-0.350	0.083	-4.22	0.004***
Ais	0.049	0.029	1.67	0.095*
Bsf	-0.073	0.055	-1.33	0.185*
Bsi	0.084	0.041	2.06	0.040**
Age	0.000	0.000	0.89	0.375*
Size	-0.051	0.029	-1.77	0.083*
Lev	0.237	0.052	4.54	0.000***
Roa	-0.085	0.025	-3.42	0.001***
Loss	0.133	0.041	3.22	0.001***
Mtb	-0.010	0.002	-4.55	0.000***
Blnd	0.266	0.070	3.78	0.000***
Busy	0.202	0.028	6.99	0.000***
Be	-0.082	0.045	-1.80	0.072*
Weighted Statistics				
Number of obs	1147			
R Squared	0.5754			
Adjusted R-Squared	0.5059			
P-value	F(14,1132)= 11.12			
	0.000			

Note: ***,** and* denote significance at 99%,95% and 90% respectively

Table 18.
Fixed effects Regression (Financial internal control weakness)

variable	Coef	Std.Err	z	p-value
Cons	0.619	0.262	2.36	0.018***
Incap	-0.013	0.006	-1.96	0.050**
Soc	-0.000	0.000	-1.80	0.072*
Ais	0.092	0.042	2.19	0.029**
Bsf	-0.116	0.053	-2.19	0.028**
Bsi	0.092	0.057	1.60	0.110*
Age	-0.041	0.024	-1.72	0.089*
Size	-0.026	0.160	-1.65	0.099*
Lev	0.192	0.058	3.31	0.001***
Roa	-0.068	0.023	-2.89	0.004***
Loss	0.111	0.037	2.96	0.003***
Mtb	-0.010	0.002	-3.58	0.000***
Blnd	0.195	0.083	2.34	0.019***
Busy	0.181	0.053	3.39	0.001***
Be	-0.000	0.000	-2.36	0.018***
Weighted Statistics				
Number of obs	1147			
R Squared	0.0588			
Adjusted R-Squared	0.1549			
P-value	Chi2(14) = 96.08			
	0.000			

Note: ***,** and* denote significance at 99%,95% and 90% respectively

Table 19.
The results of the model for T+1

variable	Coef	Std.Err	Z	p-value
Cons	1.762	0.868	2.03	0.043**
Incap	-0.055	0.018	-3.03	0.002***
Soc	-0.002	0.000	-2.96	0.003***
Ais	-0.096	0.034	-2.78	0.006***
Bsf	-0.003	0.012	-1.92	0.054**
Bsi	0.004	0.001	3.21	0.002***
Age	-0.021	0.014	-1.50	0.133*
Size	-0.013	0.004	-2.81	0.005***
Lev	0.006	0.002	2.24	0.027**
Roa	-0.034	0.010	-3.32	0.001***
Loss	0.006	0.002	2.48	0.013***
Mtb	-0.010	0.003	-3.18	0.002***
Blnd	0.009	0.002	4.15	0.000***
Busy	-0.135	0.061	-2.20	0.028**
Be	-0.003	0.012	-1.92	0.054**
Weighted Statistics				
R_Squared	0.0480			
Adjusted R-Squared	0.2256			
P-value	F(13,783)= 3.04			
	0.0002			

Note: ***,** and* denote significance at 99%,95% and 90% respectively

Appendix 1.

The results of the Hadari test

Variable	Sig.	Variable	Sig.
INCAP	0.8213	ICW	0.5410
AIS	0.3029	SOC	0.5102
BSI	1.0000	BSF	1.0000
SIZE	1.0000	BLND	0.1908
BUSY	0.1892	LEV	0.9903
ROA	0.2257	LOSS	0.2099
MTB	0.1719	AGE	0.1384
BE	0.7655	ICWOF	0.5321
ICWF	0.3984	ICWIT	0.4091

Appendix 2.

The results of the Kolmogorov-Smirnov test

Variable	Sig.	Variable	Sig.
INCAP	0.000	ICW	0.628
AIS	0.000	SOC	0.937
BSI	1.000	BSF	1.000
SIZE	0.000	BLND	0.005
BUSY	0.033	LEV	0.004
ROA	0.000	LOSS	0.755
MTB	0.173	AGE	0.294
BE	0.000	ICWOF	1.000
ICWF	0.354	ICWIT	1.000

Appendix 3.
The results of the VIF test

Variable	VIF	1/VIF
Size	1.53	0.653
Ais	1.36	0.733
Loss	1.25	0.799
Roa	1.20	0.834
Lev	1.18	0.846
Be	1.17	0.852
Mtb	1.16	0.864
Soc	1.14	0.875
Blnd	1.11	0.896
Age	1.05	0.956
Incap	1.09	0.918
Bsf	1.06	0.944
Busy	1.05	0.949
Bsi	1.03	0.967
Mean VIF	1.17	

Appendix 4.

The results of the sensitivity analysis

	ICW	ICWOF	ICWIT	ICWF	INCAP	SOC	AIS	BSF	BSI	AGE	SIZE	LEV	ROA	LOSS	MTB	BLND	BUSY	BE
Icw	1.000																	
ICWOF	0.182	1.000																
ICWIT	0.306	0.073	1.000															
ICWF	0.221	0.157	0.039	1.000														
Incap	-0.080	-0.032	-0.043	-0.053	1.000													
soc	-0.305	-0.008	0.043	-0.013	0.056	1.000												
Ais	0.017	0.002	0.032	0.073	0.052	0.014	1.000											
Bsf	-0.038	0.008	-0.019	-0.074	0.043	-0.080	0.009	1.000										
Bsi	0.057	0.008	0.052	0.053	-0.056	0.003	0.023	-0.026	1.000									
Age	0.093	0.022	0.047	0.024	-0.045	-0.099	0.061	0.059	-0.072	1.000								
Size	0.105	0.001	-0.045	0.065	0.035	-0.111	0.489	-0.039	0.043	-0.021	1.000							
Lev	0.044	0.087	0.033	0.166	0.009	-0.007	0.066	-0.029	0.072	0.056	0.074	1.000						
Roa	-0.058	-0.046	-0.032	-0.073	0.198	0.052	0.104	-0.016	0.033	-0.030	0.081	-0.040	1.000					
Loss	-0.153	0.083	-0.007	0.145	-0.105	0.239	-0.068	-0.033	-0.028	0.034	-0.099	0.280	-0.163	1.000				
Mtb	0.059	-0.053	0.039	-0.120	-0.001	0.029	-0.031	-0.035	-0.023	0.042	-0.123	-0.088	-0.288	-0.066	1.000			
Blnd	-0.030	-0.061	0.008	0.053	0.089	0.133	-0.022	-0.036	-0.107	-0.106	-0.082	-0.224	0.063	-0.083	-0.047	1.000		
Busy	0.004	0.024	-0.106	0.186	0.097	0.040	0.053	-0.153	-0.012	0.001	-0.001	-0.008	0.037	0.005	0.075	0.014	1.000	
Be	-0.009	-0.021	-0.010	0.025	-0.071	0.000	0.162	-0.106	-0.034	-0.021	0.033	-0.059	0.023	0.019	-0.007	-0.004	-0.060	1.000

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