Board Characteristics and Value Creation

Subjects: Management

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Firm value relies considerably on intellectual capital. As a reliable source of sustainable competitive advantage, intellectual capital can lead a firm to economic growth and technological development. As the mainstream of intangible assets, it is expected that the application of intellectual capital plays a critical role in developing sustainable competitive advantages for companies. Intellectual capital is a vital intangible asset to a business, especially in high-tech industries. A considerable part of organizational knowledge is embodied in the board's intellectual capital, contributing significantly to the board's decision-making. The board's intellectual capital should be managed appropriately to create value for a company even in unpredictable economies, increase competitive advantages, and stabilize profitability.

value creation firm growth intellectual capital gender diversity

1. Firm Improvement and Intellectual Capital

Intellectual capital is a set of structural and human capital, including the applied business, organizational technology, customer relationship, and professional skills. Producing a sense of competitive advantage could lead to a company's growth in the market [1]. Intellectual capital is a type of asset, which measures the capability of an organization for generating wealth. It is also argued that such an asset has no objective and physical nature and is a type of an intangible asset, which is achieved by applying properties related to human resources, organizational performance, and relations outside the organizations [2]. Finally, it is defined that Intellectual capital refers to the intellectual assets from a strategic and global perspective.

Cabrita and Jorge [3] argue that, from a strategic perspective, intellectual capital is used to create and apply knowledge to enhance firm value. Value creation is at the heart of strategic management, and the rationale of intellectual capital is its ability to create value. Thus, intellectual capital and strategy are intricately woven. Cruz Basso et al. [2] demonstrate that all proposed intellectual capital characteristics may lead to intra-organizational growth. Intellectual capital can be defined as a combination of intangible or trivial assets, which are not disclosed in the balance sheet. According to accounting literature, human capital, organizational capital, relational capital, and customer capital are among the specific characteristics and components of intellectual capital [4][5][6]. If the intellectual capital characteristics are being managed properly, companies' growth could lead to companies' growth [7].

Alternatively, several studies suggest that intellectual capital is positively related to a firm's financial performance and market value. They may be considered an allocator of future financial performance [8][9][10]. For instance,

Dženopoljac et al. [10] reveal that intellectual capital impacts the ICT industry's financial performance. Even it is suggested that intellectual capital may improve the bankruptcy models, which is pivotal to nowadays economy for wealth creation [1][11][12]. Bchini [13] found a positive and significant relationship between the components of intellectual capital and value creation. Vomberg et al. [14] discovered a complicated relationship between intellectual capital and brand value. The board's intellectual capital should be managed appropriately to create value for the company, increase the competitive advantages, and stabilize the profitability, especially in unpredictable economies [15]. Lu and Zhang [16] noted that the higher education of a CEO could increase the value of Chinese companies significantly.

In today's economy, which is based on knowledge and awareness of companies' future trends and the process of value creation, an essential element of planning is the intellectual capital of managers that are an indispensable part of firm value creation [17]. Hence, to improve production, managers must make the fixed price of goods and services, diligent and timely decisions to preserve the favorable quality. It is also suggested that increasing education plays an important role in gaining professional expertise, enhancing directors' cognitive skills. Therefore, it is expected that more educated directors may realize, analyze business matters more easily and propose more sufficient solutions.

Harjoto et al. [18] find that board nationality diversity and educational background diversity are positively associated with CSP. Salehi et al. [19] show that the audit committee's expertise, proxied by its' members' educational background, plays a significant role in improving its profitability. Salehi and Farzaneh [20] found that firms benefit from board human capital in terms of outside directors' proficiency, validity, experience, specialty, and knowledge to monitor and counsel managers. Polsiri and Sitthipongpanich [21] noted that those CEOs with related work experience had made better strategic decisions and subsequently raised the firm value.

Beattie and Smith [22] indicated that intellectual capital could significantly contribute to value creation and competitive advantage. Del Carmen Triana et al. [23] show that CEO educational background diversity positively impacts strategic change, ultimately improving firm performance. Olayinka et al. [24] emphasize the relevance of financial education for board members in improving firms' performance. Altuwaijri and Kalyanaraman [25] show that graduated CEOs contribute to firms' performance more significantly than less educated ones. Saidu's [26] findings indicate that CEO education improves a firm's profitability. Naseem et al. [27] find that CEO characteristics like age, gender, and education significantly affect firm financial decisions and firm performance. Lari Dashtbayaz et al. [28] show a positive relationship between board independence and human capital. However, they found a negative and significant link between audit committee size and human capital.

In contrast, Schmidt suggests that educational levels or board gender quotas do not affect the positive relationship between board gender diversity and firm performance [29]. In addition, Elmagrhi et al. [30] do not show any evidence suggesting that the level of education of female directors impacts environmental performance. Therefore, we expect that boards with educated members in industry-related fields.

Prior literature also suggests that the greater educational level of directors plays a positive role in firm performance improvement and may cause improvement the innovation and a better understanding of customer's needs, which in turn improve efficiency and competitiveness [31][32]. One of the precursors to better managerial effectiveness is the attainment of some level of education. Education is an important tool for consideration in the employees' promotion and perhaps the remuneration. A good level of education has significance in raising the managers' prestige hence enabling them to give out an optimum decision

Darmadi et al. [33] evidence that board members' educational qualifications and the CEO matter, to a particular extent, explain either ROA or Tobin's *Q*. Doms et al. [34] indicate that more educated entrepreneurs tend to be located in metropolitan areas with more educated workforces. Moreover, highly educated areas have above-average entrepreneurship rates. Storey [35] recognizes that there is evidence that "high-performance work practices" appear to be associated with better performance but argues that this relationship is less likely to be present in middle-sized companies. Magoutas et al. [32] found that staff intellectual capital, proxied with academic certificate level, significantly affects companies' growth rate. However, Lu and Zhang [16] analyzed COE education's effect on the firm growth rate. Their findings indicated that the CEO's higher education has no significant impact on Chinese companies' growth rate.

Sansone et al. show that university investments positively impact the local community through the spin-off system, both in economic terms and intellectual capital. In the long term, these investments can enrich scientific humus and entrepreneurial mindsets [36]. La Torre et al. [4] suggest that losing confidentiality, integrity, or data availability because of a data security breach poses a threat to IC and value creation. Thus, cyberthreats compromise the social value of Big Data, impacting stakeholders' and society's interests. Cenciarelli et al. [5] show that intellectual capital performance is negatively associated with default probability. The findings also indicate that the bankruptcy prediction models that include intellectual capital have a superior predictive ability over the standard models. Salehi [6] propose that board members' higher educational levels may also decrease agency costs.

2. Gender Diversity and Value Creation

The boards' main responsibility is monitoring and providing recommendations for managers to improve the firms' performance. It is suggested that (1) such a monitoring function (proposed by agency theory) may explain the influential role of gender diversity in corporate performance, (2) resource dependence and human capital are proposed as explanatory theories by the diversity brought to the board by female directors, and (3) behavioral-based theories might elaborate it through some various behavioral features of women directors compared to their men colleagues [37].

According to agency theory, female directors on a board may develop a wider range of perspectives in decision-making processes, leading to greater independence of the board and reducing agency costs. Consequently, it is expected that such a characteristic in the boards increases the value of companies. This theory is proposed by academic bodies as a critical issue when discussing the significant impact of gender diversity on companies' performance [38]. For instance, supporting agency theory, Adams and Ferreira [39] argue that female directors may

supervise and control board activities. In addition, Solimene et al. [36] argue that since women are more educated in recent years, having graduated with M.A and Ph.D., they are greatly professional and well-experienced, making decisions on the boards of directors efficiently.

Similarly, the resource dependency theory considers female directors unique and valuable resources for boards; they are considered an essential link between the firms, the existing environment, and the external resources on which a company competes. In other words, having ties and contacts by female directors with internal and external environments is proposed to draw resources into the organization, leading to improved economic performance [40]. Alternatively, Anderson et al. [41] argue that female directors possess innovative ideas to compare to those of the old boys' club. The new abilities proposing by female directors to the board provide innovative perspectives and valuable recommendations to executive managers, leading efficient decisions making, greater innovation and creativity, and better information availability [42][43][44]. Pucheta-Martínez and Gallego-Álvarez's [45] board characteristics, such as board size, board independence, and female director, are positively associated with firm performance [45]. Loukil et al. [46] show that stock market liquidity is positively and significantly associated with women directors' presence. However, a contradictory argument implies to potential disadvantages of female directorship. In this part, it is suggested that the relationship between gender diversity and independence is questionable. Having discouraged managers' motivations, stricter monitoring policies might decline shareholder wealth and the deteriorating effect on the relationship between managers and the board [39]. Moreover, a lack of cohesiveness among the board members and tokenism can degrade interactions among individuals working as advise providers.

Previous studies explain that the proportion and age of female directors positively affect overall corporate environmental performance. The proportion and age of female directors also have a positive effect on the three individual environmental performance components, namely, environmental (a) strategy, (b) implementation, and (c) disclosure [30]. Yang et al. [47] explain the main sources of biases in the existing literature on women directors' effects on firm performance and review methods to account for these biases. Their results imply a negative effect of mandated female representation on firm performance and firm risk [42]. Schmidt [29] finds a positive relationship between board gender diversity and firm performance.

Green and Homroy [48] demonstrate a robust positive effect of female board representation on firm performance. They also demonstrate economically meaningful positive effects on the performance of female representation on board committees. A positive effect of gender diversity on financial performance is also reported [49]. Bøhren and Staubo [50] find that the Norwegian gender quota was associated with increased board independence and reduced firm value, particularly for smaller firms, more eager for valuable advice from board members than monitoring [50]. A non-linear relationship, especially in grades 2, between female institutional directors and firm value. By increasing the number of female institutional directors on the board, the firm value will initially magnify. However, after reaching a certain value, the firm value goes down [51].

However, Bennouri et al. [37] find that female directorship significantly increases ROA and ROE and significantly decreases Tobin's Q as a market-based performance.

Having suggested ambiguous conclusions about the association between gender diversity in the board of directors by existing literature, for instance, positive results are revealed by several studies [29][47][48], and many others state negative impact [48][50][51][52][53] as well as insignificant relationship, motivate us to conduct such an investigation to provide a more clear picture of such an association [54][55][53].

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