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The Impact of Intellectual Capital Efficiency on Jordanian Companies Performance: The Moderating Roles of CEO Duality

Rawan ABDELGHAFOR JOS¹, Norhayati MAT HUSIN², Hamza ISMAIL HYARAT³

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Abstract

CEO duality and its impact on firm performance represent one of the most contentious issues in both academia and business. This study, therefore, aims to examine the moderating role of CEO duality in the relationship between intellectual capital Efficiency (human, structural, relational, Capital Employed, and Innovation) and firm performance (earnings per share and Tobin's Q) among Jordanian companies. The study sample consists of services listed companies on Amman Stock Exchange. The study used panel data for the period 2014–2018 with a sample size of 230 observations. SPSS software was used to analyze the collected data. The regression results indicate a significant relationship between, IC and firm performance. When CEO Duality is incorporated into the model as a moderator, there is an increase in the R^2 by 7.9%. The findings from this study expand the theoretical underpinning of corporate governance research by identifying the performance implications of CEO duality within the Jordanian context. It also contributes significantly to the literature review about the current status of the practices taken in the intellectual capital components efficiency among companies listed on the Amman Stock Exchange. Findings from this study also provide contributions to the concerned policymakers such as the Ministry of Finance, Securities Commission, and Amman Stock Exchange in Jordan, to improve the current policies related to intellectual capital efficiency.

Keywords: CEO Duality, Firm Performance, Intellectual Capital

JEL Classification Code: G0, G2, G3

1. Introduction

In the Middle East, the Jordanian economy is listed as the weakest, with Inadequate reserves, apart from phosphate and other natural resources, of oil, water, and other natural resources. Therefore, the government of Jordan relies heavily on external assistance (Al-Qadi

& Lozi, 2017). The industrial sector, generally, and the service sector, are considered the most important sectors that the Jordanian economy is based on. Developing these sectors is necessary to play its economic and developmental role, as well as focusing on information and knowledge, as well as paying attention to the human element, which is the foundation of these operations. Moreover, the human element is considered the basis of innovation and creativity (Weshah et al., 2016).

The intangible point of view looks at the economy or individual entity as a combination of three ingredients: resources, flows, and transformations of resources. Resources could be tangible, financial, or intangible. The intangible perspective stressed resources that are not material and considered the importance of this hidden wealth for companies and the national economy. Drucker (1993), considers that intangible assets induced a process of transformation of society. His process has created a society in which the major resource is knowledge. In the “knowledge society” values are created not by the allocation of capital or labor but by innovation. An intangible asset can also provide some information on intellectual capital. Intellectual

¹First Author and Corresponding Author. College of Business Management and Accounting, Universiti Tenaga Nasional, Malaysia. ORCID ID: 0000-0002-0200-4457. [Postal Address: Universiti Tenaga Nasional, Kampus Sultan Haji Ahmad Shah, Muadzam Shah, Pahang, 26700, Malaysia] Email: Rere.ghos@yahoo.com

²[1] Senior Lecturer, College of Business Management and Accounting, Universiti Tenaga Nasional, Malaysia. [2] Institute of Energy Policy & Research, Malaysia. ORCID ID: 0000-0003-3142-5274. Email: hayati@uniten.edu.my

³College of Business Management and Accounting, Universiti Tenaga Nasional, Malaysia. Email: Hamzeh.hyari@gmail.com

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capital (IC) is knowledge, information, intellectual property, and experience – that can be put to create wealth (Stewart, 2010). This IC will enhance the value of the company in the investors' eyes (Nuryaman, 2015).

IC has been regarded as a crucial factor of competitive advantage and sustainable success for corporations in the last decades. Accordingly, the topic has attracted the attention of both practitioners and academicians to reveal and quantify its impact on firms' financial and market performance. The research into intellectual capital, as an intangible asset has been highlighted in recent decades and has allowed the recognition of another type of strategic nonaccounting resource that permits organizations to generate better performance (Pirogova et al., 2019; Xu & Liu, 2021). Intangible assets, as given by knowledge, brands, patents and trademarks, customer relationships, and R & D (Sowaity, 2022), may be more relevant to the company's value than tangible assets. In fact, the share for this kind of asset in companies' market value may amount up to 75–85%, which has created a challenge in recognizing and measuring this type of investment in companies' financial reports leading to difficulty in making accurate valuations of companies' value (Ge & Xu, 2021; Ghani & Che Azmi, 2022).

In the case of Jordan, Jordan Securities Commission – Amman Stock Exchange, which issued a law that disclosure of IC is voluntary and not compulsory, leading to the fact that most of the listed companies tend to choose not to disclose information on their intellectual capital. Therefore, with lack of disclosure on IC, has caused less focus on how IC efficiency is affecting Jordanian companies' performance. Despite the many supervisory bodies in Jordan, the financial crises and failures that affected many companies in various countries of the world also hit many Jordanian companies and led to their bankruptcy (Al-Sawalqa, 2014), such as Arab German Insurance Company and many industrial companies such as Phosphate and potash, where they were filtered for reasons related to negative management practices, and their violation of regulations and instructions. Ud Din et al. (2021), explains that corporate governance continues to receive considerable attention from academics, market participants, and regulators in recent years because the theory still provides conflicting views regarding primarily the impact of the Board structure on the control and performance of firms since the empirical evidence is inconclusive in this sense. Due to the great importance of corporate governance, for its social and economic impact (Peter et al., 2014), research and studies are needed to discuss the factors influencing it.

Following this, the Board of Characteristics plays an important role in organizations by being responsible for making strategic decisions essential to the development of companies. This is because the board's roles and responsibilities have a direct impact on every part of the company (Thakolwiroj & Sithipolvanichgul, 2021). The role

of this advice is also addressed in the Agency Theory, set forth by Jensen and Meckling (2019), which addresses the issue of the separation of ownership and control at the corporate level, so that existing conflicts of interest may pose a threat to the achievement of objectives organizations. As highlighted previously, services companies have continually sought to develop their operations through research, development, obtaining patents, having a good reputation and brand by training employees and improving their skills, attracting highly qualified and skilled people, building a network of communication with the external environment and gaining consumers' satisfaction and loyalty (Hamdan et al., 2017). Thus, intellectual capital and its efficiency are considered necessary to increase corporate performance and its market value, which ultimately affects the economy as a whole.

This study attempts to identify the CEO Duality role' play in moderating the relationship between intellectual capital (human, structural, relational, Capital Employed, and Innovation) and companies' performance (earnings per share (EPS), and Tobin's Q) from the Jordanian service sector. The paper is arranged into five sections. The introduction is in section one, the review of related literature is in section two, the data and methods are displayed in section three, the results and discussion are shown in section four, and the paper is concluded in section five.

2. Literature Review

2.1. Definition of Intellectual Capital

Many intellectuals, scholars, and economic writers talk about IC in terms of its definition, importance, measuring, and efficiency for many reasons, and this intellectual capital contributes greatly to raising the level of the economy in all fields and all forms. To manage and measure a phenomenon, it needs to be clearly defined. IC represents a research topic with conceptual clarity, but great variety and diversity when it comes to developing a precise definition. As the first step in capturing the holistic effect that IC has on existing and future performance, it is necessary to define the term properly (Dzenopoljac et al., 2017).

Galbraith (1969) is the first author to propose the concept of IC in his book *The New Industrial State*, he described it as an intellectual contribution of individuals. Kitts et al. (2001), on the other hand, describe intellectual capital as a reservoir of experience and skills gained by the employees, the relationship with the customer, which gives a competitive verge in the market over its competitors. However, Stewart (1997), defines intellectual capital as the individual's knowledge that makes the firm compete in its industry, furtherly it consists of knowledge, information, intellectual property right, and experiences that add value to the firm owners. Tan et al. (2007), suggested that intellectual capital

is the intellectual ability that presents the efficiency of using physical capital and the intellectual potential to create value and maintain competitive advantage.

On the other side of the fence are Blair and Wallman (2000) who argued that it is difficult to give a precise definition for intangible assets as well as IC. Most definitions of intellectual capital found in the literature the intangible capital based on knowledge and related resources that an organization utilizes to generate value (Kianto et al., 2017). From an accounting perspective, the difference between the market value and book value of a firm has been seen as the most evident indicator of the IC, as it is the economic value of the intangible capital (Forte et al., 2017). Based on the above, it can define intellectual capital is one of the most important concepts that might be valuable for any organization that has knowledge-based assets, which can generate profits and improve competitiveness. This is due to its capabilities in adding value and making a difference in any organization through creating wealth, achieving economic growth, ensuring a competitive edge and innovation, ensuring better business performance in a sustainable business environment through providing unique services and products, and building a solid relationship with stakeholders.

2.2. Measurement for Intellectual Capital

According to Ramírez et al. (2020), IC has emerged as the core contributor to the value creation of a firm in an economy dominated by the creation and diffusion of knowledge. Many articles have highlighted this issue (Chen et al., 2005; Clarke et al., 2011; Luthy, 1998). There has been widespread research on IC that has generated various methods for the classification and measurement of the concept. Different approaches, including Tobin's Q, the Skandia Navigator, the Intangible Assets Monitor, the balanced scorecard approach, market capitalization methods, and the VAIC model, have been created for quantifying IC. The VAIC model was developed by (Pulic, 2000, 2004, 2008), VAIC is the result of adding the capital employed efficiency (CEE), human capital efficiency (HCE), and structural capital efficiency factors (SCE) (Nazari & Herremans, 2007). The original VAIC model ignores the firm's RC and innovation capital (Smriti & Das, 2018). Similarly, the measure of SC in the original VAIC model may not be complete (Chen et al., 2005). Xu and Liu (2021), proposed an extended VAIC model with the introduction of innovation capital (measured by R&D expenses) and Relational capital (measured by marketing and advertising expenses) They found that the proposed model performs better compared to the original VAIC model. this indicates an improvement in the company's overall efficiency in managing its resources in general, and the knowledge of employees in particular, thus increasing the economic value that the company creates.

2.3. Hypotheses Development

2.3.1. Intellectual Capital Efficiency and Firm Performance

In another study, Xu and Liu (2021) also found that contributed a positive relationship between intellectual capital efficiency and the financial performance of manufacturing SMEs in China. Adding to that, Xu and Wang (2018), empirically demonstrated the impact of IC on the financial performance of the Korean manufacturing industry. The results of the analysis show that intellectual capital efficiency has a positive impact on financial performance and companies. In short, the positive relationship between intellectual capital efficiency and firm performance at the firm's level was validated by a large number of empirical studies, including studies that focused on the firms in the manufacturing sector in Jordan.

Human capital includes skills, knowledge, individual values, education, attitudes, training, creativity, and workers' experiences, including their specializations (Dahiyat et al., 2021). Tran (2022), empirically found a positive relationship between human capital efficiency and firm performance as such, it is considered necessary to enhance the skills of the workforce to improve productivity. Rahim et al. (2017), focused on a firm's performance in the Malaysian technology industry and found a significant and positive relationship with a firm's performance. Findings from this study may be useful to companies' managers to make better decisions pertaining to the proper deployment of their strategic asset, namely human capital. As stated by Dzenopoljac et al. (2017) market performance was mainly influenced by human capital.

As for structural capital, there are several positive implications of structural capital on firm performance which in turn provides the firm with competitive advantages (Chatterjee & Kar, 2020). Studies have demonstrated a positive relationship between structural capital on performance to achieve superior performance, organizations need to identify, develop systems, structures, and processes, which comprise factors such as databases, management processes, organizational plans, and corporate approaches, and use them efficiently (Barpanda & Bontis, 2021). In another recent study, Silvia and Maftukhah (2018), and Ulfi et al. (2019), affirmed that structural capital has a positive and vital effect on the financial performance and firm value of the business.

Liu (2017), comments that rational capital is important for performance improvement because it can generate trust in the organization. in addition, Xu and Wang (2018), found that rational capital efficiency has the highest degree of correlation with the profitability of Korean manufacturing firms. Sharabati et al. (2016) in her study also indicated that relational capital has the highest impact on Kuwait's telecommunication organizations' business performance

Capital employed helps firms maintain a good relationship with their external as well as their internal stakeholders, which include but are not limited to customers, consumers, government, employees, creditors, and suppliers (Chowdhury et al., 2019). Bala et al. (2021) found that capital-employed efficiencies significantly and positively determine firm value. Besides that, Hamdan et al. (2017), investigated the association between IC and firm performance and found that the success to which the firm reached in best investing its capital to create value added for the firm. Innovation capital is defined as “the ability to build on previous knowledge and generate new knowledge,” and protective capital as “legally protected rights concerning ownership of specific intellectual assets, such as patents, copyrights, trademarks and trade secrets.” Xu and Liu (2020). Besides, there are studies depicting a positive relationship between innovation capital efficiency and financial performance indicators ROA and ROE (Chang & Hsieh, 2011; Chen et al., 2005; Kusumawardhani, 2012).

Different theories, put forward by some theorists, made researchers across the globe realize the importance of IC in enhancing firm performance. One such theory is the resource-based view put forward by Wernerfelt (1984), which stated that resources are the physical and intangible resources that belong to the firm. This theory focuses on over-analysis of the heterogeneous, imitable, and immobile resources present within the firm. The resource-based theory of the firm and tangible and intangible resources draws significant interest in the strategic management, economic, and accounting literature based on the observed links between intangible resources and performance measures. Thus, a direct impact of IC on firm performance is expected (Tan et al., 2007). Based on the prior study’s findings, the hypotheses are therefore stated as follows:

H1: Human capital efficiency significantly affects the firm performance.

H2: Structural capital efficiency significantly affects Firm performance.

H3: Relational capital efficiency significantly affects the firm performance.

H4: Capital employed efficiency significantly affects Firm performance.

H5: Innovation capital efficiency significantly affects Firm performance.

2.3.2. CEO Duality and Firm Performance

A study by Khan and Ali (2018), investigates this possibility and documents that studies that treat CEO duality as exogenous do not suffer from selection bias. According to Tahir et al. (2020), the key benefits of a diverse board are effective in monitoring independently; these benefits are

less likely when the board members and the CEO belongs to the same diverse group. Consistent with this, Linck et al. (2008), also find that performance does not appear to drive CEO duality. In contrast, Wintoki et al. (2012), provide evidence that CEO duality may be a function of past values of firm performance and hence not strictly exogenous. Regarding the existing empirical evidence, three review papers by Zahra (2003), Finegold et al. (2007), and Krause et al. (2014) provide no evidence of a systematic relationship between CEO duality and firm performance. All concluded that the extant research reveals mixed results. Based on the prior study’s findings, the hypotheses are therefore stated as follows:

H6: CEO Duality is positively associated with firm performance.

2.3.3. CEO Duality Moderates the Relationship between Intellectual Capital Efficiency and Firm Performance

Markets around the world have undergone an industrial shift from intensive capital to knowledge based on more intangible resources. Traditional performance measures failed to measure and control multiple dimensions of performance because they stressed almost exclusively the financial aspects of the organizations as shown by (Berger & Bouwman, 2013; Chen et al., 2005). Thus, the new techniques are considered necessary to measure the value of the intangible objects which affect the company’s performance.

CEO duality, a situation in which one person holds both the CEO and chairman positions, has become an alarming issue following the recent failures of corporate giants in the early 2000s (Aktas et al., 2019; Duru et al., 2016; Yang & Zhao, 2014). Krause et al. (2014), define CEO duality, or duality of functions, as the practice in which a single person performs both the role of CEO and the Chairman of the Board of Directors and emphasize that this is a theme that has aroused the interest of academics for some decades, although research generally has not reached conclusive results regarding the impact that this practice may actually have on organizations.

CEO duality and its impact on firm performance represent one of the most contentious issues in both academia and business. In recent years, especially since the passage of the Sarbanes-Oxley Act of 2002, agency arguments and empirical evidence on the negative performance impact of duality have led to calls for abolishing the combined leadership structure. Overall, the empirical evidence on the relationship between CEO duality and firm performance has proven inconclusive (Duru et al., 2016; Pham & Pham, 2020). Thus, determining whether CEO duality ultimately enhances firm performance

is an increasingly important question for corporations, business practitioners, and academics.

Ali et al., (2022), investigated the relationship between corporate governance and firm performance in the top 75 companies from 2010 to 2019. The study concludes that CEO duality is not found to be associated with firm performance when an individual holds the position of CEO and the board director in an organization, simultaneously (Finkelstein & D'aveni, 1994).

Internationally, separating the role of chair of the board from the role of CEO is considered a prominent factor determining the level of corporate governance regulation. In this regard, agency theory argues that combining the roles of these two, dominating the board, provides incentives for the CEOs to involve in opportunistic behavior (Barako et al., 2006). The results of this study show that CEOs' duality has no effect on firm performance. In this regard, suggest a positive association Saidat et al., (2019), Pucheta-Martínez and Gallego-Álvarez (2020), and Jwailes (2021). Further analyses, in line with the findings of Nguyen et al. (2018), Kanakriyah (2021), There is evidence that CEO duality has a positive effect, maximizes the sense of responsibility towards the company, and leads to more interest and eagerness to raise the company's performance. It means that boards containing more independent members show less opportunistic behavior, as they have less self-interest in companies' outcomes (Salehi et al., 2020).

Next, the theory that dominates the discussion of the relationship between CEO duality and firm performance is Agency Theory. As the primary theoretical framework that emphasizes the monitoring role of boards, agency theory argues that boards should be independent of management to limit managerial entrenchment and opportunism (Jensen & Meckling, 1976). By breaching this independence, a dual board leadership structure is likely to have a negative impact on performance since it attenuates the board's potential to monitor management effectively (Jensen, 1993). The board is a governance mechanism in the agency framework, for strategic decision-making and setting organizational vision (Abdullah, 2004), by the supposition that when the shareholders have the information to verify and influence supervision deeds, the executives are more likely to act in the interests of the shareholders. Based on the prior study's findings the hypotheses are therefore stated as follows:

H7: CEO Duality positively moderates the relationship between intellectual capital efficiency and firm performance.

H7a: CEO duality positively moderates the relationship between human capital efficiency and the firm performance.

H7b: CEO duality positively moderates the relationship between structural capital efficiency and firm performance.

H7c: CEO duality positively moderates the relationship between relational capital efficiency and the firm performance.

H7d: CEO duality positively moderates the relationship between capital employed efficiency and the firm performance.

H7e: CEO duality positively moderates the relationship between innovation capital efficiency and the firm performance.

3. Research Methods

3.1. Study Sample and Data Source

This research will consider 46 service companies except non-listed companies will be excepted, because of a lack of published data. Data were collected from annual reports of the service sector firms listed on the ASE for the relevant years

3.2. Data Collection

The study used the annual time series data for the period 2014–2018 with an expected sample size (230) observations. Intellectual capital efficiency includes the items that represent the efficiency of human capital, structural capital, and relational capital also capital employed, innovation capital. This study applies the modified and extended VAIC method $VA = \text{Operating profit} + \text{Depreciation} + \text{Amortization} + \text{Employees' salaries and wages} + \text{Marketing and advertising expenses} + \text{R\&D expenses}$ and investigates the IC-performance relationship of services firms listed on the Amman Stock Exchange during 2014–2018.

3.3. Study Variables

The variables used in the analysis can be broadly classified into three categories: the independent variable, dependent variables, and moderating (Table 1).

3.4. Research Model

Multiple regression analysis is able to test the degree of affiliation between one dependent and two or more independent variables (Saunders & Lewis, 2012). In a multiple regression analysis, the relationship between the dependent variable and the independent variable is linear. The linearity will show how the dependent variable change to a certain degree when the independent variable changes (Saunders & Lewis, 2012). In this study, multiple regression analysis is used to examine the strength of a cause-and-effect relationship. The determination of the relationship is represented by the following regression equation.

Table 1: Study Variable

Variables	Labels	Measurement	Source
Dependent Variables			
Market-based Performance	EPS	Calculated by dividing net income by the average number of outstanding shares	Thomson Reuters Database
	Tobin's Q	Is the (Market value of equity ÷ Book value of short-term liabilities) Book value of total assets	Thomson Reuters Database
Independent Variables			
Human Capital Efficiency	HCE	It is calculated by the ratio between value added and total salary and wages of employees	Financial report
Structural Capital Efficiency	SCE	It is calculated by the ratio between the SCE and VA of the firm	Financial report
Relational Capital Efficiency	RCE	It is calculated by marketing and advertising expenses and VA	Financial report
Capital Employed Efficiency	CEE	It is calculated by the ratio between the VA and CEE of the company	Financial report
Innovation Capital Efficiency	ICE	It is equal to total R&D expenditure and VA is value added	Financial report
Moderating Variable			
Board Characteristics	CEO Duality	Dummy variable, i.e. 1 = if the CEO also holds the position of chairman, 0 = otherwise	Financial report

Note: EPS: Earnings Per Share, VA: Value Added.

Table 2: Descriptive Results

	N	Mean	SD	Skewness	Kurtosis
HCE	230	3.225	9.83	1.405	23.931
SCE	230	0.521	3.467	-7.160	98.259
RCE	230	0.011	0.527	-7.322	83.282
ICE	230	-0.010	0.159	-9.680	106.324
CEE	230	0.272	0.683	-6.311	85.492
EPS	230	0.141	0.410	5.517	42.015
Tobin's Q	230	1.200	0.976	6.261	58.151
CEO Duality	230	0.100	0.301	2.684	5.251

$$Y = \beta_0 + \beta_1(X_1) + \beta_2(X_2) + \beta_3(X_3) + \beta_4(X_4) + \beta_5(X_5) + \varepsilon$$

Where:

Y = Firm Performance

X_1 = Capital Employed Efficiency (CEE)

X_2 = Human Capital Efficiency (HCE)

X_3 = Structural Capital Efficiency (SCE)

X_4 = Relational Capital Efficiency (RCE)

X_5 = Innovation Capital Efficiency (ICE)

ε_i = error term

4. Results

4.1. Descriptive Statistics

Table 2 demonstrates the descriptive statistics of performance measures and the modified and extended VAIC model's measures for 230 service firms. The positive mean values of firm performance suggest that the service sector in Jordan has positive performance on average. Among IC efficiency values, HCE has the highest mean value, which

Table 3: Correlation Results and VIF

	HCE	SCE	RCE	RED	CEE	EPS	Tobin's Q	CEO Duality	VIF
HCE	1.000								1.129
SCE	0.309**	1.000							1.222
RCE	0.190**	-0.559**	1.000						1.217
ICE	0.208**	-0.251**	0.161*	1.000					1.136
CEE	0.360**	-0.320**	0.246**	0.442**	1.000				1.005
EPS	0.353**	0.173**	-0.052	0.298**	0.493**	1.000			1.092
Tobin's Q	0.074	0.025	0.043	0.237**	0.378**	0.462**	1.000		1.390
CEO Duality	-0.187**	0.072	-0.111	0.079	-0.078	-0.012	0.076	1.000	1.053

Note: ** and * indicate significant at 5% and 10%, respectively.

indicates human resources are crucial to service firms in the creation of value, which is in line with the findings of Xu and Wang (2018), Xu and Liu (2021), and Bayraktaroglu et al. (2019). The mean value of SCE is 0.5288. However, the contribution of RCE, ICE, and CEE to creating value is quite low. Table 1 also shows that the mean value of EPS is 0.1413. Jordan service firms have, on average, 1.1999 of Tobin's Q.

To check normality, the study depends on the “*Skewness and Kurtosis*” tests. Data is considered to be normal if the standard skewness is within ± 1.96 and the standard kurtosis is ± 3 (Haniffa & Hudaib, 2006). As shown in Table 2, the skewness and kurtosis results exceed the range of (± 1.96) and (± 3).

4.2. Correlation Analysis

According to Pallant (2011), the correlation could be characterized as a measurable estimation of the relationship between two variables. Correlation analysis was conducted for this study to test the relationship between Intellectual Capital Efficiency and Firm Performance, as shown in Table 3. As the collected samples are normally distributed through the parametric statistic technique, Pearson's correlation is employed to examine the relationship between the independent variables and the dependent variable. This study considers two measures of firm performance. Hence, separate regression analyses were conducted. Both financial measures show a weak correlation to the independent variables of the study. Moreover, as expected, VAIC has a high correlation with its components HCE and SCE Gujarati and Porter (2009), indicate that when the correlation coefficient results between the explanatory variables are larger than 0.80, there is proof of multicollinearity problems. Table 3 shows that the explanatory variables have lower correlation coefficient values; thus, multicollinearity cannot be a problem in interpreting the regression results.

Further, the study analyzed the result of multicollinearity between the explanatory variables employing the analysis of variance inflation factor (VIF). The values of VIF range from 1.005 to 1.390, which are all smaller than 10. Hair et al. (2014), points out that VIF values lower than 10 suggest that the impact of multicollinearity among explanatory variables is not significant in the regression model. Therefore, the multicollinearity problem is absent from the results

4.3. Regression Analysis

Table 4 shows the findings of the multiple regressions for five hypotheses tested without moderating variables. The result in Table 4 shows that HCE is positively related to firm performance at the 1% level. The findings suggest that spending on employees should be treated as an investment, and firms should effectively use these human resources to create more wealth. This result is in line with the previous studies by Hamdan et al. (2017), Haniffa and Hudaib (2006), Wang et al. (2016), and Smriti and Das (2018). Given the positive relationship between human capital and performance, managers need to pay special attention to human resources and invest in developing their knowledge, skills, and capabilities. Conversely, Firer and Williams (2003), argued that spending on employees is treated as expenditure by firms. SCE was found to have non-significant impacts on firm performance when the new components (i.e. RCE and ICE) were introduced, a result consistent with Xu and Wang (2018), Ferraro and Veltri (2011), Buallay et al. (2017), and Firer and Williams (2003); however, this is contrary to the findings of Hsu and Wang (2012) and Hamdan et al., (2017) as they showed that structural capital is positively associated with firm In addition, ICE had no significant on the firm's performance. Whereas Amin and Aslam (2017), argued that ICE is a process to transform products, services, and ideas that can increase the success of a business. Innovative businesses are more efficient and productive as compared to others.

Table 4: Summary of Regression Results

Variables	Hypothesis Test Results Without Moderating Variable			Hypothesis Test Results With Moderating Variable		
	Coefficient	t-value	p-value	Coefficient	t-value	p-value
Intercept	1.245	2.923***	0.004	0.123	3.588***	0.004
HCE	0.083	4.042***	0.004	0.02	1.335	0.182
SCE	0.033	0.997	0.320	0.11	1.559	0.120
RCE	0.189	1.171	0.243	0.112	1.146	0.252
ICE	0.456	0.997	0.320	0.007	2.037**	0.042
CEE	0.238	2.105**	0.036	0.138	3.158***	0.002
HCE X CEO Duality				0.071	1.140**	0.010
SCE X CEO Duality				0.095	1.603	0.198
RCE X CEO Duality				0.082	1.289***	0.004
ICE X CEO Duality				0.136	3.247***	0.001
CEE X CEO Duality				0.139	1.195	0.233
Adjusted R ²	0.194			0.273		
F-Square	1.750***			3.296***		
N	231			231		

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

According to the results, the effect of RCE on firm performance was negative, whereas Xu and Wang (2018), argued that RCE is the most influencing factor in firm profitability. An increase in innovation capital and RC will lead to lower profitability. This result may be because, according to accounting standards, R&D along with marketing and advertising expenditures are expensed when incurred, which reduces the current year's profit. The result below also shows that CEE has a significant effect on firm performance. Further, in line with Buallay et al. (2017), Hejazi et al. (2016), and Hamdan et al. (2017), Overall results indicate that CEE can explain the performance of listed firms in Jordan demonstrating that an increase in value creation efficiency affects firm's performance in the country.

Next, regression analysis was done, with CEO Duality as the moderating variable. Table 4, shows that the moderating variable HCE X CEO Duality, RCE X CEO Duality, and ICE X CEO Duality has a significance value < significance level (0.05). This means that partially HCE, RCE, and ICE moderated by CEO Duality have a significant effect on firm performance. In comparison, the moderating effect has a significant level of more than (0.05) SCE X CEO Duality and CEE X CEO Duality> This means CEO Duality does not moderate the relationship between SCE and CEE with firm performance,

As for R^2 , the value of the R^2 for both models show the overall changes in the respective dependent variables that are attributed to the firm performance and the moderating variable (CEO Duality). The comparison of the Coefficient of Determination R^2 without and with CEO Duality as Moderating effect depicted that R^2 of moderating effect is 0.273 implying that 27.3% variance of firm performance is explained by the model. R^2 changed to 0.079, which indicates an increase of 7.9% in variances. The result of the regression for all the two models with and without moderating variables is summarized in Table 4 below.

5. Discussion and Conclusion

IC and Firm performance have been the focus of research in the field of accounting and finance over the last two decades. Firms in this modern era have been striving for competitive advantage through various sources. These sources do not only include efficient factors of production, but also there have been major shifts from physical assets towards intangibles. In this regard, several studies have reported that IC resources contribute significantly to the value-creation process for firms.

The main purpose of the present study is to examine the moderating role of CEO duality in the relationship

between intellectual capital Efficiency (human, structural, and relational, Capital Employed, and Innovation) and firm performance (earnings per share, and Tobin's Q) among Jordanian companies. As discussed in the findings above, the result indicated that HCE and CEE have a significant effect on firm performance with t -values 4.042*** and 2.105**. The results of the moderating variable indicate that CEO Duality moderates the relationship between HCE, REC, and ICE and firm performance. This result indicates that CEO Duality plays a role in improving the HCE, RCE, and ICE in the firm.

This study contributes greatly to the literature review about the current status of the practices taken in the intellectual capital components efficiency among companies listed on the Amman Stock Exchange. Particularly, this current study will expand the existing knowledge about intellectual capital efficiency, with board characteristics as a modified variable; this affects the firm Performance in Jordanian companies.

The findings from this study also provide contributions to the concerned policymakers such as the Ministry of Finance, Securities Commission, and Amman Stock Exchange in Jordan to improve the current policies related to intellectual capital disclosure, provide several incentives or facilities such as training on how the intellectual capital is disclosed in the public shareholding companies listed on the Amman Stock Exchange, in particular, the industrial sector. These training courses should be useful enough for investors in making decisions as they are significant in the Jordanian economy. Moreover, the results of this study are useful for stakeholders including companies, investors, decision-makers, and regulatory agencies to develop their awareness about intellectual capital, the importance of corporate governance, and increasing the level of adaption. Furthermore, it would be useful that companies to make the IC disclosure priorities and financial plans to raise their Firm performance with corporate governance as a modified variable.

Future research can be done using another proxy for intellectual capital by combining both monetary and non-monetary methods. Also, additional research shall focus on other sectors, such as banks and Industrial firms by analyzing other corporate governance mechanisms (board size, board independence, etc.), and examining their impact on firms' performance and value.

Limitation of the study: Considering that the used sample was limited to the ASE-listed services companies, the obtained results cannot be generalized to other non-listed companies operating in the Middle East region.

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