



# Can Intellectual Capital be a Matter for Corporate Performance? Evidence From Zain Group

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**Abstract:** This study analyses the association between the financial performance of Zain Group, as one of a leading mobile telecommunications provider in the Middle East and North Africa, and intellectual capital (IC) through 15 years from (1999 to 2013). The study has adopted three factors for IC as a first set of variables. They are structural capital (SC), customer capital (CC) and human capital (HC), and two variables for corporate performance (CORP) as the second set of the study. First one is earnings before interest, tax, depreciation and amortization (EBITDA) and the other is net profit (Nprofit). The findings of the study highlight the components of IC on Zain Group and their impact on CORP. The canonical correlation analysis shows an association between IC, that is most influenced by SC followed by CC, and CORP that is most influenced by Nprofit. In conclusion, the results suggest that both SC and CC have a significant impact on CORP when measured by Nprofit. In contrast, HC has no significant impact on CORP.

**Keywords:** Intellectual Capital; Zain Group; Corporate Financial Performance.

## Introduction

Telecommunication technology presents several opportunities for the creation of unprecedented wealth for different countries. In today's information age, the telecommunication industry has a vital role to play in industrial and economic development, the industry has been aiding delivery of voice and data services at rapidly increasing speeds, and thus, has been revolutionising human communication. The telecommunication industry is the most dynamic industry that is characterized by a high speed of innovation and competition. Consequently, such industry is very linked with Intellectual Capital (IC). Draghici (2013) argues that IC is promoted as an important and necessary factor for organizational survival and maintenance of competitive strength. The association between (IC) and Corporate Performance (CORP) has been documented in several studies (see; Tsui et al. 2014; Mehralian et al. 2013; Tayles et al. 2007; Roos et al., 2005). The importance of IC comes from the fact that traditional accounting systems do not reflect reality for managers or investors in such a way that they understand

how their resources – many of which are intangible – create value in the future (Gogan, 2014). IC is seen as the main resource and a key driver in managing profitability (Marr et al, 2003). Edvinsson and Malone (1997) point out that IC increasingly provides the roots of a company's value, being the invisible factors that contribute to create it in the firm, over and above the stock of visible or tangible assets. The authors also suggest four key dimensions of IC (financial; customer; process and renewal and development focus).

Moreover, Chen et al. (2005) provide evidence on IC increases for both revenues and profitability for 30 Taiwanese companies using four models of CORP, return on ownership, return on assets, growth in net sales, and net value added per employee. In the same line, the results of the multiple regression analysis, employed by Sharabati et al (2013) on the three components of IC (CC, SC and HC), are shown that these components together explained 35.7 percent of the variance, where ( $R^2=0.357$ ,  $F=14.815$ ,  $Sig. =0.000$ ). Although the relationship between the three components



of IC (CC, SC and HC) and CORP has received considerable attention in literature, such literature fails to reach a consensus regarding the degree of the importance of each component on CORP. Therefore, inconsistent results have been documented. For example, Wu et al. (2008) argue that SC and CC are the two major components of IC and knowledge productivity the competitive position of companies is heavily dependent on systems and programs which provide positive climate for the scientists in order to be creative and innovative (Huang and Wu, 2010; Sharabati et al., 2010). While, Cabrita and Bontis (2008) consider HC as the key element of intellectual assets and one of the most important sources of firm's sustainable competitive advantages. HC continues to be a key character of innovation, organizational competitiveness and economic performance particularly for knowledge-based environments. This also could be important for financial and information management, business planning and corporate governance (Lynn et al., 2009).

The current study investigates the association between the financial performance of Zain Group, as one of a leading mobile telecommunications provider in the Middle East and North Africa, and IC through 15 years from (1999 to 2013). The study has adopted three factors for identifying IC as a first set of variables. They are SC, CC and HC, and two variables for CORP. The overall results show worthy relationships between IC and CORP.

Motivations for the study can be summarized as follows: although the difficulties are related to IC evaluation, there are several advantages for companies to identify IC and disclose information on it. Firstly, this can help to reduce information asymmetry between a company and external users. Secondly, the address of IC can help to enhance the value relevance of financial reports and may help to avoid misallocation of capital. Thirdly, companies are interested in evaluating IC to establish trustworthiness with employees and other stakeholders. Bruggen et al. (2009) argue that the dissemination of trust is one of the most important factors in the company's long-term growth strategies because it creates stakeholders' higher commitment to

the future of a company. Finally, evaluating IC is manifesting the company's market value.

The study is structured as follows. In the next section, Section 2 presents a review of the literature, followed by hypotheses development, while Section 3 presents the case of Zain Group. Section 4 describes the research method employed to test the relationship between IC and CORP. The empirical results of the study are provided in Section 5. Finally, in Section 6, conclusions, limitations and future research are presented.

## 2. Literature review and hypotheses development

### 2.1 Identification of IC

IC is generally recognized as an intangible asset of a company that is difficult to evaluate by conventional financial report (Mehralian et al. 2013; Huang and Wu, 2010; Sharabati et al., 2010). Herman (2010) defines IC as the key competencies of employees, comprising individual knowledge and skills. Lynn (1998) and Marr (2005) argue that organisations employ three types of capital: physical; financial; and IC. These combine to form an organisation's resources, and as such need to be well managed. Moreover, Abdullah and Sofian (2012) categorize IC into four core components: spiritual capital, HC, SC and CC using questionnaire survey as the data collection method. Sveiby (1997) categorises intangibles into internal structure, external structure and employee competence. Based on the knowledge source and structure, Roos et al. (1997) define IC as the economic value of two elements in particular: SC and HC. Several studies have divided IC into three categories: SC, HC, and CC (see; Edvinsson and Malone, 1997; Maeques et al. 2006; Sydler et al. 2014). Following a number of these studies (see, Edvinsson and Malone, 1997; Wexler, 2002; Roos et al., 2005; Maeques et al., 2006; Sydler et al., 2014), the current study classifies IC into three factors as SC, HC and CC.

Concerning SC, Edvinsson and Malone (1997) state that SC as everything that "supports employees' productivity" or "everything that gets left behind at the office when employees



go home". SC comprises mechanisms and structures which support employees. In reality, they are the companies' routines and convert individual human assets into group assets. While, Tsui et al. (2014; p. 1316) point out that SC composes of organization's routines, procedures, strategies, and policies that are in charge of organization's daily operations whereas organizational capital is the collective and institutionalized knowledge and experience residing within and utilizing through databases, patents, manuals, structures, systems, and processes of an organization. Similarly, Edvinsson (1997) and Cohen and Kaimenakis, (2007) point out that SC is created by containing and retaining knowledge to become company property. It includes intellectual properties consisting of patents, licenses, trademarks, etc. Consistent with previous arguments, the current study argues that SC composes everything inside the company after excluding human resources costs. SC includes intellectual properties consisting of patents, licenses, trademarks, systems and structures.

On the other hand, Vargo and Lusch (2004) indicate that companies must develop their relationships with customers to create new products. Consequently, companies can change tangible elements (e.g., products) to intangible elements, such as skills, information, and knowledge, and therefore towards interactivity, connectivity and on-going relationships. Tsui et al. (2014; p. 1316) point out that CC refers to all knowledge acquired by organizations because of their interaction with the external environment such as competitors, partners, customers, regulators, etc. CC includes marketing channels, customer relationships, supplier relationships, customer loyalty, governmental and industrial networking, intermediaries or partners (Sullivan, 1999; Tayles et al. 2007; Wall et al., 2004; Roos et al., 2005). In line with the previous discussion, CC refers to a firm's relationships with external parts. The more relationships the company has with strong external partners such as customers, partners, regulators and investors, the greater the market share percentage of the company increases. Finally, regarding HC, a number of studies (see; Wall et al., 2004; Tayles et al. 2007; Marr, 2008) refer that HC includes knowledge,

professional skills and experiences, expertise, educational level and creativity of employees. Petty and Guthrie (2000) identify HC as staff competencies and the competencies of external stakeholders available to the firm.

## 2.2. Prior studies on the association between IC & CORP

Sydler et al. (2014) investigate the impact of IC on the long-term differences in firm profitability. The authors show a significant positive correlation between the firms' IC over time and their profitability. These findings support that companies with increasing IC over time will become more profitable. Consequently, IC operates as a critical strategic lever for profitability and may be instrumental in sustaining a competitive advantage. In the same line, Cabrita and Bontis (2008) Cohen and Kaimenakis (2007) by using surveys investigate the impact of IC on CORP. Their results show that IC has a significant positive impact on CORP. Mehralian et al. (2013) developed indicators of IC in knowledge-based industries using a self-administered questionnaire, that was distributed to both industry and university experts who qualified well in pharmaceutical practice. In order to obtain exact prioritization of indicators, fuzzy TOPSIS technique as a MADM model was used. The results of the study revealed that experts confirmed 42 important and relevant items to IC. Also, they remarked high concerns especially about knowledge and skills of managers and employees regarding HC.

In Malaysia, Abdullah and Sofian (2012) determine the impact of IC on corporate performance of Malaysian public listed companies (PLCs). The findings of the study confirm that all IC components have significant positive relationships with corporate performance of Malaysian PLCs. CC emerged as an IC component that has the strongest relationship with CORP, followed by other components. This result suggests that IC is vital to business success and CORP. The respondents agreed that high IC indicates a higher performance. Also, CC is the most influential, followed by spiritual capital, SC and HC. This is inconsistent with the findings by



Bontis et al. (2000) who concluded that HC is the most important IC in Malaysian companies. The overall correlation analysis results clearly show that all four IC components have a significant positive relationship with CORP and are consistent with the results of Tayles et al. (2007). Lu et al. (2014) evaluate the performance of 34 Chinese life insurance companies for the period 2006–2010. Regression analysis of the study reveals that IC is significantly positively associated with a firm operating efficiency. The results of this study show that IC can make a company rich. In a dynamic business such as life insurers, managers should invest and fully utilize IC to gain a competitive advantage.

Sharabati et al (2013) investigate the influence of IC on the performance of Jordanian Telecommunication Companies (JTCs). The study surveyed 84 managers at JTC companies. A number of statistical techniques such as descriptive statistics, t-test, ANOVA test, correlation and multiple regressions were employed. The results indicated that the CC variable has the highest effect on the performance of JTCs, where (Beta=0.378, sig. =0.002). Thus, it indicates that the CC variable is the most significant and positively and directly regresses to the performance of JTCs, followed by HC variable, where (Beta =0.217 sig. =0.119), while SC variable has the lowest effect on the performance of JTCs, where (Beta=0.076 sig. =0.575).

In the light of the above discussion, it is clear that previous studies regarding the impact of IC on CORP have provided a variety of results. In the current study, IC is presented throughout three factors (CC, SC, and HC) and CORP is presented by two financial measures. Accordingly, the following main hypothesis can be suggested:

H1. There is a significant relationship between IC and CORP.

The main hypothesis can be broken into the following sub-hypotheses as follows:

H1a. There is a significant relationship between CC and CORP

H1b. There is a significant relationship between SC and CORP

H1c. There is a significant relationship between HC and CORP

### 3. An Overview of Zain Group<sup>1</sup>

Zain is a leading mobile telecommunications provider in the Middle East and North Africa. It began life in 1983 in Kuwait, as a Mobile Telecommunications Company (MTC), the region's first mobile operator, and commencing with the initiation of expansion strategy in 2003, it grew rapidly in both the Middle East and Africa through the acquisition of several mobile operators across the region. For example, in 1994, Zain in Jordan, formerly Fast link, revolutionized the telecom sector in Jordan by becoming the first to introduce mobile services in the country. Moreover, in the Kingdom of Bahrain, Zain started commercial operations in December 2003 as MTC-Vodafone and became the first operator to offer 2G and 3G services from the outset. Also at the same time it has been providing mobile services in Iraq, then Zain was listed launched commercial operations in the Kingdom of Saudi Arabia in August 26 in 2008. Zain Listed on the Kuwait Stock Exchange (KSE) since 1985, there are no restrictions on Zain shares as the company's capital is 100% free float and publicly traded. The largest shareholder is the Kuwait Investment Authority with a 24.6% stake.

In September 2007, MTC rebranded to Zain in order to better reflect the growing status as a leading multi-national mobile service provider with global aspirations. Zain was thus adopted as the Group's corporate master brand. In 2008 Zain became the 4th largest mobile operator in the world in terms of geographical presence, with operations in 15 African countries and 7 in the Middle East. Zain continued its journey of growth and development, and in March 2009, entered into a 50/50 partnership with Al Ajial Investment Fund Holding to acquire a 31% stake in Inwi, the third mobile telecom operator in Morocco. By 2010, Zain had taken the strategic decision to focus on its highly cash generative Middle East and North Africa operations, investing in new growth opportunities in

1- All information in this section were collected from the Website of Zain companies and from its consolidated financial reports from (1999- 2013).



these markets. This decision led to the sale of 100% of Zain Africa BV ('Zain Africa') to Bharti Airtel Limited in June 2010 for the total consideration of USD 10.7 billion on an enterprise value basis. This represented a bitter-sweet moment in its history in Africa, while at the same time humbled by the success and value Bharti Airtel identified in the operations on the continent. The 15 countries that Bharti Airtel acquired from Zain in Africa were: Burkina Faso, Chad, Democratic Republic of the Congo, Republic of the Congo, Gabon, Ghana, Kenya, Madagascar, Malawi, Niger, Nigeria, Sierra Leone, Tanzania, Uganda and Zambia. This company operates as Zain in Bahrain, Jordan, Kuwait, Iraq, Saudi Arabia, Sudan, South Sudan; and in Lebanon as touch (under a management contract).

In Africa, Zain Group re-defined itself as a leading mobile and data services operator in the Middle East and North Africa, with a commercial footprint in 8 countries in the region. Zain had a market capitalization circa USD 11 billion on December 31st, 2013, with a leading customer market share of 39%, it was able to improve its market position reporting year-on year customer growth of 12% during 2013. The growth in customers was a result of the introduction of innovative voice and data packages and aggressive marketing promotions and incentives predominantly for smartphone users taking advantage of the company's state-of-the-art nationwide 4G LTE network. In 2014, Zain Group has over 6,000 employees provide a comprehensive range of market-leading mobile voice and data services to a base of over 46.2 million active customers.

Zain believes effective corporate governance will in the long term improve its performance, benefiting all stakeholders and ultimately serving the public interest. Every mature corporation needs to develop a culture that defines the role of its people. Companies with a professional and positive commitment to corporate governance are typically stronger, with a greater record of achievement than those that do not. The benefits of good corporate governance are tangible, with rating agencies now looking at such practices, and lower borrowing costs being made available for

companies that comply. This benefit has been evident in Zain's case over the last decade with financial institutions providing the company with substantial financial facilities. A key part of Zain's vision is to instill and promote a culture of uncompromising integrity and the highest professional and ethical standards across its entire spectrum of companies Group operations. One component of corporate governance is to have an effective and independent Internal Audit Function. This function in Zain covers the entire group and is outsourced to Protiviti Member Firm (Middle East), a global risk consulting and internal audit firm. Another component of corporate governance is the issuance of financial results in a timely and transparent manner. As the largest publicly traded company on the KSE, Zain abides strictly by the standards required by the KSE and all regulatory authorities through the full transparency and the timely issuance of both quarterly reviews and annually audited financial statements that are reviewed by two external auditors, Deloitte & Touche, Al Fahad, Al Wazzan & Co and Baker Tilly Kuwait Dr. Saud Al-Humaidi & Partners.

As part of the corporate governance, Zain has adopted a set code of conduct, embracing the values of the organization and how it does business, whereby the company and all its stakeholders abide by it. Zain has adopted a system of corporate governance based on the principles endorsed by the Organization for Economic Cooperation and Development (OECD) that are extensive.

#### 4. Research method

This section aims to present the methodology adopted in the current study and the form of data analysis being undertaken to test the hypotheses developed earlier in this study. Since the objective of the study is to analyse the association between CORP of Zain Group and IC through 15 years from (1999 to 2013). Variables for both IC and CORP are identified in the following sub-section (4.1). Then, the association between these variables was examined by Canonical Correlation Analysis in sub-section (4.2).



#### 4.1 Variables of the study

Following a number of studies (Tsui et al. 2014; Tayles et al. 2007; Roos et al., 2005; Wall et al., 2004; Petty and Guthrie, 2000), the current study identified IC using three components (SC, HC, and SC). Measuring these components in the current study is based on the general knowledge of literature and the data of 15 consolidated financial reports of Zain Group from (1999- 2013). For the purpose of the current study, SC includes intellectual properties consisting of patents, licenses, trademarks, systems and structures. Thus, SC was measured from consolidated financial reports of Zain Group as the total intangible assets and total capital expenditures. Literature on CC refers to a firm's relationships with external parts. The market share percentage was used as a proxy of CC. It can be a sign of the relative competitiveness of the company's products or services. As the total market for a product or service grows, a company that is maintaining its market share is growing revenues at the same rate as the total market. A company that is growing its market share will be growing its revenues faster than its competitors. In the light of figures and facts that were presented in consolidated financial reports of Zain Group, HC was measured by total expenses related to human resources (board of directors and employees). These expenses include salaries of board members, remuneration, allowances and dividends, salaries of employees, employees' dividends, training and education program for employees and employee pension plan.

On the other hand, there are several proxies of CORP used in prior research (Lu et al. 2014; Gogan, 2014; Chen et al, 2005), including return on asset, return on ownership, growth in net sales return on equity, total sales, growth revenue turnover, market capitalization, net income before tax, earning per share. Literature does not provide criterion to choose among these proxies. In the current study two proxies of CORP are used. Firstly; net profit (Nprofit) while the other one is earnings before interest, tax, depreciation and amortization (EBITDA), and is a measurement of a company's operating profitability. Because EBITDA excludes depreciation and amortization, it can provide an investor with a cleaner view of a company's core profitability.

#### 4.2 Canonical Correlation Analysis (CCA)

CCA is the general procedure for investigating the relationships between two sets of variables. If we have two vectors of random variables, and there are correlations among the variables, then CCA will find linear combinations of them and which have maximum correlation with each other. Canonical correlation is the appropriate technique for identifying relationships between two sets of variables. In general, the number of canonical dimensions is equal to the number of variables in the smaller set; however, the number of significant dimensions may be even smaller (see, Anderson, 1984; Sharma, 1996 Borga, 1999; and Chaudhuri et al. 2009). In the current study, all the analysis was done using the package CCA in R-software (website: <http://cran.r-project.org/>).

**Table 1: The canonical correlation**

Dimension	Canonical Correlation	Canonical correlation square	Eigen	percent	Cumulative
1	0.9258	0.8571	5.9987	86.75	86.75
2	0.6914	0.4780	0.9158	13.25	100.00

Table 1 above shows that dimension 1 had a canonical correlation of 0.93 between the sets of variables and for dimension 2 had a canonical correlation 0.69. To test canonical dimensions,

Table 2 below presents the results of this test where the canonical correlation in the current row and all that follow are zero.

**Table 2: tests of canonical dimensions**

Dim	WilksL	F	Df1	Df2	P
[1,]	0.07458	4.1349	6	10	0.019079
[2,]	0.52197	0.3853	2	3	1

Table 2 shows that the first test of the canonical dimensions is significant at 0.05 and 0.10 (where  $0.019079 < (0.05, 0.10)$ ) and the next test for dimension 2 is not significant at the three level of significant 0.01, 0.05 and 0.10 ( $1 > 0.10$ ). Therefore, the value of the first canonical correlation is 0.93, and the p-value indicates that it is statistically significant at an alpha level of 0.05 and 0.10 while the value of the second canonical correlation is 0.69, and p-value indicates that it is not statistically significant. Hence, the correlation between the two sets of variables can be accounted for by just one pair of canonical variates at alpha 0.05 and 0.10.

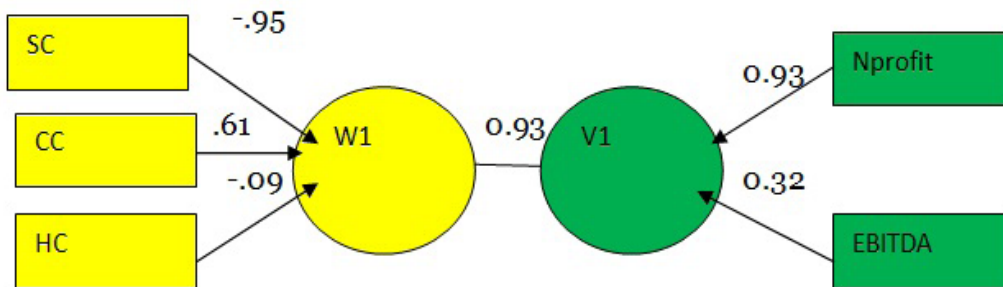
**Canonical variates**

Where the first canonical correlation is significant, we will work with it. Therefore the canonical variates for IC are

The canonical variates for CORP are the raw canonical coefficients which are interpreted in a manner analogous to interpreting regression coefficients i.e., for the variable HC, a one unit increase in HC leads to a 0.0009 increase in the first canonical variate of set 1 when all of the other variables are held constant.

**Loading**

These loadings are correlations between variables and the canonical variates. Figure 1 shows the correlation between the first canonical variates W1 and V1 and the two sets of variables IC (SC, CC, HC) and CORP (Nprofit, EBITDA). It can be seen from the graph the first canonical correlation accounts for the highest correlation (about 0.93) between the IC and CORP. Also the graph suggests that the variables, SC, CC and Nprofit, are more influential in forming the canonical variate.



**Figure 1: Correlation between the first canonical variate and the sets of variables**

**The standardized coefficients**

The standardized coefficients allow for easier comparisons among the variables. Next, we'll

compute the standardized canonical coefficients as shown in Table 3.

**Table 3: Standardized canonical coefficients for intellectual performance**

	IC			CORP	
	[,1]	[,2]		[,1]	[,2]
SC	-1.373	-.923	Nprofit	1.229	-0.411
CC	-0.480	-1.50	EBITDA	-0.464	1.209
HC	0.127	-0.482			

The standardized canonical coefficients are interpreted in a manner analogous to interpreting standardized regression coefficients. For example, consider the variable Nprofit, a one standard deviation increase in Nprofit leads to a 1.229 standard deviation increase in the score on the first canonical variate for CORP when the other variables in the model are held constant. The standardized canonical coefficients for the first two dimensions across both sets of variables show that for intellectual variables, the first canonical dimension is most strongly influenced by SC (-1.373) then CC (-0.480). For the performance, the first dimension was most influenced by Nprofit (1.229).

### 5. Empirical results and discussion

Canonical coefficients give the contribution of each variable in the presence of all other variables (Sharma, 1996; Borga, 1999; Chaudhuri et al. 2009). The findings of the study highlight the components of IC in Zain Group and their influence on CORP. The canonical analysis indicates an association between IC and CORP which can support the main hypothesis of the current study, and generally is consistent with the results of Lu et al. (2014), Cabrita and Bontis (2008) and also Cohen and Kaimenakis (2007). CCA results determine the relationship amongst the IC variables and CORP, thus recognizing its direction, as either positive or negative relationship. The overall correlation analysis results show that SC has a significant negative relationship with CORP variables (Nprofit and EBITDA); consistent with the results of Tayles et al. (2007), Lu et al. (2014) and Abdullah and Sofian (2012). On the other hand, CC has a positive correlation with Nprofit and EBITDA. Also, HC has a negative correlation with Nprofit and EBITDA. The more interesting finding of the current study is

SC is usually connected with high relationships with Nprofit (CORP variables). This finding shows that SC has the most important IC variables and has a strong impact on CORP followed by CC. This is in contrast contrast with Bontis et al. (2000) who provide evidence on HC as the strongest factor of IC related to CORP. It is also inconsistent with Sharabati et al (2013) who provide evidence on SC variable which has the lowest effect on the performance of JTCs, where (Beta=0.076 sig. =0.575).

Moreover, in Malaysia, the results of Abdullah and Sofian (2012) show that CC is the most influential component of IC that is related to a higher corporate performance which is inconsistent with the results of the current study. In general, the canonical analysis indicates a noticeable relationship between IC and CORP, in line with a number of studies as Sydlar et al. (2014), Cabrita and Bontis (2008) Cohen and Kaimenakis (2007). In conclusion, the above results suggest that both SC and CC have a significant impact on CORP when measured by Nprofit consequently, H1a and H1b can be accepted. In contrast, the results of the current study suggest that HC has no significant impact on CORP, thus H1c is rejected.

### 6. Conclusions

IC is an important intangible asset in today's business, particularly in current knowledge intensive economy which also relies heavily on technology such as the telecommunication industry. IC has been frequently recognized as invaluable intangible asset which is managed and utilized to stimulate innovativeness, creativity, competitive edge, value creation and boost CORP. The findings of the study highlight the components of IC on Zain Group and their impact on CORP. The canonical correlation analysis shows an association between IC, that





is most influenced by SC followed by CC, and CORP that is most influenced by Nprofit. In conclusion, the results suggest that both SC and CC have a significant impact on CORP when measured by Nprofit. In contrast, HC has no significant impact on CORP.

Since this study was directed towards telecommunication industry, Zain Group is one of a leading mobile telecommunications provider in the Middle East and North Africa. One limitation refers to specific industry which can be developed by other researchers in different environments to test the degree to which the findings can be generalized to other industries. Second, the study has adopted canonical correlation analysis therefore, other statistical techniques may have different findings. The current study holds several implications for future research. First, future research could investigate similar phenomena in countries with different political environments. Second it would also be interesting to conduct the study on other industries, which would reveal implications regarding differences across sectors and potentially increase the sample size. Third, it would be useful to conduct the study with considering other factors such as corporate disclosure, different types of risks and corporate governance characteristics.

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### References

- Abdullah, D. F and Sofian, S. (2012). The relationship between intellectual capital and corporate performance, *Procedia - Social and Behavioural Sciences*, Vol.40, pp. 537 – 541.
- Anderson, T. W. (1984) *An Introduction to Multivariate Statistical Analysis* (2nd edition). John Wiley and Sons.
- Bontis, N., Chua, W. C. K. and Richardson, S. (2000). Intellectual Capital and Business Performance in Malaysian Industries. *Journal of Intellectual Capital*, Vol.1, No.1, pp.85-100.
- Borga, M. (1999). Canonical correlation. Online tutorial. Available online at <http://www.imt.liu.se/magnus/cca/tutorial>.
- Bruggen, A., Vergauwen, P., and Dao, M. (2009). Determinants of intellectual capital disclosure: Evidence from Australia, *Management Decision*, Vol. 47, No. 2, pp. 233–245.
- Cabrita, M. R., & Bontis, N. (2008). Intellectual capital and business performance in the Portuguese banking industry, *International Journal of Technology Management*, Vol. 43, No. (1–3), pp. 212–237.
- Chaudhuri, K., Kakade, S. M., Livescu, K., and Sridha-ran, K. (2009) Multi-view clustering via canonical correlation analysis. In ICML.
- Chen, M., Cheng, S., & Hwang, y. (2005). An Empirical Investigation of the Relationship between Intellectual Capital and Firms Market Value and Financial Performance, *Journal of Intellectual Capital*, Vol.6, No.2, pp.159-177.
- Cohen, S., and Kaimenakis, N. (2007). Intellectual capital and corporate performance in knowledge intensive SMEs, *The Learning Organization*, Vol.14, No.3, pp.241–262.
- Draghici, A. (2013). A possible approach for generic model concerning intellectual capital evaluation. Annual session of scientific papers IMT, Vol. 12, pp. 267-273.
- Edvinsson, L., and Malone, M. (1997). *Intellectual capital: Realising your company's true value by finding its hidden brainpower*. New York: Harper Collins.
- Gogan M. L. (2014). An innovative model for measuring intellectual capital, *Procedia - Social and Behavioural Sciences*, No. 124, pp. 194 – 199.
- Edvinsson, L. (1997). Developing intellectual capital at Skandia, *Long Range Planning*, Vol. 30, No.3, pp.366–373.
- Herman, A. (2010). Intellectual Capital and Its Measurements. *Economics & Business Administration Journal*, Vol. 2, pp. 7-16.



- Huang, Y. C., and Wu, Y. C. J. (2010). Intellectual capital and knowledge productivity: The Taiwan biotech industry, *Management Decision*, Vol. 48, No. 4, pp. 580–599.
- Lu, W., Wang, W. and Kweh, Q. (2014). Intellectual capital and performance in the Chinese life insurance industry, *Omega*, Vol. 42, pp.65–74.
- Lynn, B. (1998). Intellectual capital: Key to value-added success in the next millennium, *CMA Magazine*, Vol. 72, No. 1, pp.10–15.
- Lynn, L. K. L., Christopher, C. A., and Chan, P. D. (2009). Perceptions of human capital measures: From corporate executives and investors, *Journal of Business Psychology*, Vol. 25, pp. 673–688.
- Maeques, D. P., Simon, F. J., and Caranana, C. D. (2006). The effect of innovation on intellectual capital: An empirical evaluation in the biotechnology and telecommunication industries. *International Journal of Innovation Management*, Vol. 10, No. 1, pp.89–112.
- Marr, B., Gray, D., and Neely, A. (2003). Why Do Firms Measure Their Intellectual Capital? *Journal of Intellectual Capital*, Vol. 4, No. 4, pp. 441–454.
- Marr, B. (2005). *Perspectives on intellectual capital*. USA: Elsevier Inc.
- Marr, B. (2008). *Intangible Asset Measurement. Accountants Today*. Kuala Lumpur, Malaysia.
- Mehralian, G, Rasekh, H. R, Akhavan, P. and Ghatari, A. R. (2013) Prioritization of intellectual capital indicators in knowledge-based industries: Evidence from pharmaceutical industry, *International Journal of Information Management*, Vol. 33, pp.209–216.
- Roos J, Roos G, Dragonetti NC, Edvinsson L.(1997). *Intellectual capital: navigating the new business landscape*. London: Macmillan Press.
- Petty, R., Guthrie, J., (2000). Intellectual capital literature review: measurement, reporting and management, *Journal of Intellectual Capital*, Vol. 1, No. 2, pp.155–176.
- Roos, G., Pike, S. & Fernström, L. (2005). *Managing Intellectual Capital in Practice*, Oxford: Butterworth-Heinemann.
- Sharabatia, A. A, Nourb, A. I and Shamari, N. S (2013). The Impact of Intellectual Capital on Jordanian Telecommunication Companies' Business Performance, *American Academic & Scholarly Research Journal*, Vol. 5, No. 3, Special Issue, pp.32-46.
- Sharabati, A. A. A., Jawad, S. N., & Bontis, N. (2010). Intellectual capital and business performance in the pharmaceutical sector of Jordan, *Management Decision*, Vol. 48, No. 1, pp.105–131.
- Sharma S. (1996). *Applied multivariate techniques*, John Wiley & Sons.
- Sullivan, P. H. (1999). Profiting from Intellectual Capital, *Journal of Knowledge Management*, Vol.3, No. 2, pp. 132-142.
- Sveiby KE. (1997). *The new organizational wealth: managing and measuring knowledge based assets*. San Francisco: Berrett Koehler.
- Sydler, R. Haefliger, S. and Pruksa, R. (2014). Measuring intellectual capital with financial figures: Can we predict firm profitability? *European Management Journal*, Vol. 32, pp.244–259
- Tayles, M., Pike, R. H. and Sofian, S. (2007). Intellectual Capital, Management Accounting Practices and Corporate Performance: Perceptions of Managers, *Accounting, Auditing & Accountability Journal*, Vol.20, No. 4, pp. 522-548.
- Tsui, E, Wang, W, Cai, Cheung, L. and Lee, W (2014). Knowledge-based extraction of intellectual capital-related information from unstructured data, *Expert Systems with Applications*, Vol. 41, pp.1315–1325.
- Wu, W., Chang, M., & Chen, C. (2008). *Promoting innovation through the accumulation*



of intellectual capital, social capital, and entrepreneurial orientation, *R & D Management*, Vol. 38, No. 3, pp. 265–277.

Vargo, S. L., and Lusch, R. F. (2004). Evolving to a new dominant logic for marketing, *Journal of Marketing*, Vol. 68(January), pp.1–17.

Wall, A., Kirk, R. and Martin, G. (2004). *Intellectual Capital: Measuring the Immeasurable?* CIMA Publishing: Elsevier.

Wexler MN. (2002). Organizational memory and intellectual capital, *Journal of Intellectual Capital*, Vol. 3, No. 4, pp.393–414.