The Impact of Human Capital, Structural Capital and Relational Capital on Corporate Performance in Pakistan

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Abstract
Intellectual capital is a term frequently used to describe intangible assets (INTC). This study intends to examine the impact of three components of intellectual capital, that is, human capital, structural capital, and relational capital, on corporate performance (CP) of non-financial listed on the Pakistan Stock Exchange (PSX). This study uses quantitative secondary data spanning from 2012 to 2019, collected from annual published reports of the companies. The quantitative data analysis has been done by using the Fixed Effects Model (FEM). This research shows that each of the INTC dimensions studied has a significant positive relationship with corporate performance in Pakistan. This study will assist non-financial firms in their policy formulation related to capital structuring, which will assist them to enhance their performance. The management of non-financial firms will also benefit from this study as they can take corrective actions on their existing policies and procedures and make them competent.

Keywords: *Intellectual Capital, Relational Capital, Human Capital, Structural Capital, Corporate Performance, Fixed Effects Model*

1. Introduction

Intellectual capital (INTC) is a widely emerging concept as all profit and non-profit organizations are striving to capture high market share and best utilize their available resources in order to achieve distinction over their competitors. This competition motivates organizations to properly use their resources in order to improve their performance, which ultimately leads to the economic development and growth of a country (Muhammad & Ismail, 2009). In the recent past, researchers have started to study and explore this topic and comprehend the importance of INTC not only in a firm's performance but also in its ability and usage in creating and maintaining competitive advantage. INTC is described differently by different researchers (Ederer, 2006; Firer

& Williams, 2003). In general, INTC are essentially intangible assets that, unlike tangible assets, are not represented on a company's balance sheet but are extremely important to the process by which the company creates value (Marr et al., 2005). According to Hashim et al. (2018), many nations are making an effort to develop INTC, specifically human capital, in order to improve the intellectual capacity of their people. Although INTC is very important for a firm's performance, there is no universally accepted definition of INTC (Caibano et al., 2000). All entities such as technology, experience, knowledge, relationships of the firm with its stakeholders, and professional skills and talent are occupied by its employees (Edvinsson & Malone, 1998).

The three main components of INTC—Human Capital (HC), Structural Capital (SC), and Relational Capital (RC)—are the source of the company's value (Bontis et al., 2015; Sydler et al., 2014). HC is considered as one of the core dimensions of INTC and is defined as a means of strategic renewal of firms, creativity, innovation capacity, and sustainable competitive advantage (Chi et al., 2016; Edvinsson, 1997; Seleim et al., 2007). Existing literature states that HC consists of various factors, including experience, knowledge, ability to work in teams, loyalty, competence, talent, and motivation (Ghosh & Mondal, 2009; Janosevic & Dzenopoljac, 2012). However, some researchers propose that HC remains in the ownership of the firm only until employees stay in the organization (Ilyin, 2014; Scafarto et al., 2016; Tsakalerou, 2015). Hence, it is important for firms to focus on human resource practices as it is very crucial to retain talented and experienced employees in the organization (Saeed et al., 2016). SC remains with the firm even after employees leave, so the value of SC is undeniable (Cabrita & Bontis, 2008; Curado, 2008). Therefore, SC is explicit in nature and generally independent of employees (Chen et al., 2006; Sydler et al., 2014). According to existing research literature, organizational management, processes, strategies, brands, patents, copyrights, and information systems are included in SC (Meles et al., 2016; Tsakalerou, 2015). RC, which is defined as firms' ability to create and maintain relationships with external stakeholders and generate value from these relationships (Meles et al., 2016; Tsakalerou, 2015). The major external stakeholders of a firm are customers, suppliers, partners, creditors, competitors, distributors, shareholders, and government bodies (Bontis et al., 2015; Nassari& Nasab, 2014). RC is the most difficult to develop for firms as compared to HC and SC because it is outside of firms' control to some extent (Scafarto et al., 2016).

Generally, corporate performance (CP) is referred to as the overall health and well-being of firms and is measured by an increase in sales, assets, profits, and value (Goh, 2005). According to Riahi-Belkaoui (2003), a firm is only considered an organization when it takes resources from its stakeholders to produce goods and services for its customers. Moreover, organizational resources are a mixture of tangible and intangible assets (Skinner, 2008). Additionally, CP is associated with its business performance, including processes of business, employees' competence, and its ability to accept customer demand. In various earlier studies, the connection between INTC and company performance has been examined. Using information from 75 South African publicly traded companies, Firer and Williams (2003) examined the effect of INTC on CP. They came to the conclusion that there was a poor correlation between INTC and CP. Using data from all listed companies on the Hong Kong Stock Exchange, Chan (2009) found a favorable correlation between INTC and CP. Using data from Greek firms, Maditinos et al. (2011) suggested that there is a positive correlation between INTC and CP. Pucci et al. (2015) also suggested, based on data

from 45 Italian companies, that INTC has a favorable effect on business performance. Tsakalerou (2015) found that, after accounting for 77 Malaysian electric enterprises, INTC has a favorable effect on CP.

In addition, INTC and knowledge resources are considered crucial factors in gaining and maintaining a sustainable competitive advantage. As discussed earlier, INTC is one of the major contributors to the organization's performance, but despite its importance and contribution to the firm's performance, it has long been ignored due to conventional accounting standards such as Financial Reporting Standards (FRS) that restrict the disclosure of all intangible assets except goodwill on the firm's balance sheets (Bontis et al., 2005; Gigante, 2013; Shiu, 2006). Lipunga (2014) proposed that the 21st century is dominated by a knowledge economy, and there are numerous firms that are shifting from using physical capital towards IC. Therefore, despite being the focal point of many businesses and government organizations and a clear source of achieving competitive advantage, IC is not widely explored and studied specifically in emerging and developing economies (Pedrini, 2007). Therefore, the current study intends to investigate the impact of INTC on corporate performance among non-listed firms in Pakistan.

1.1 Resource Based Theory

The resource-based theory, proposed by Barney (1991), is considered a pioneer theory that emphasizes and explains the significance of intangible assets for firms. The basic argument proposed by this theory is that modern firms can achieve and maintain competitive advantage through the effective use of tangible as well as intangible assets. Additionally, a firm is a mixture of tangible and intangible assets where the performance of tangible and intangible assets depends on each other. For a long time, it has been believed that both tangible and intangible assets are considered strategic resources for a firm, but the attention of study has been mainly shifted towards intangible assets (Reed et al., 2006). These researchers proposed that in gaining a sustainable competitive advantage for a firm, intangible assets or INTC contribute more as compared to tangible assets. They further argued that physical assets such as plant machinery and financial assets can be replaced or substituted by a firm at any time.

Youndt et al. (2004) supported this argument by concluding that INTC is the only factor that significantly contributes and plays an important role in gaining and maintaining sustainable competitive advantage as well as firm value creation. Furthermore, Kolachi and Shah (2013) supported the resource-based theory by concluding that INTC is very important for small, middle, and large firms, especially in developing countries. On the basis of this theory, we can propose that INTC contributes significantly to the firms' overall performance. This argument is consistent with Zeghal and Maaloul (2010), who proposed that by effectively utilizing INTC, firms can earn extra returns and achieve competitive advantage as well. The remainder of this paper is structured as follows. We evaluate the available literature and develop some hypotheses in Section 2. A thorough methodology is described in section 3. We covered the analysis' findings in Section 4 of the paper. In section 5, we wrap up this work and discuss its ramifications and suggestions.

2. Literature Review

The role of intangible assets has been ignored in the past due to the supreme importance of tangible assets in value creation and their presence on the balance sheet (Jhunjhunwala, 2009).

However, Itami and Roehl (1991) stated that now the effective use of intangible assets contributes greatly to firms' success. With the fast changes in information technology, knowledge replaced most of the tangible assets and factors of production by becoming a great source of firms' competitive advantage (Edvinsson, 1997). Therefore, a significant change has been observed in the resource structure of firms since the late 1990s, as firms are now more dependent on intangible assets as compared to physical assets (Moeller, 2009). In the 21st century, intangible assets such as knowledge, innovation, and investment in research and development are considered vital components in the determination of organizations' wealth, whereas tangible assets were considered the only source that could decide the wealth of organizations in the 20th century (Garcia Parra et al., 2009). The very first study on intangible assets was conducted by Colley and Volkan (1988). They concluded that goodwill can be explained in two different ways. First, the ability of a firm to earn an abnormal profit is referred to as goodwill. Second, those assets that are not recorded on a balance sheet are known as intangible assets. Diefenbach (2006) stated that intangible assets are considered as ideas in mind rather than on paper. Additionally, they are self-renewable and their capacity is increased while being used. For instance, knowledge increases when shared with others.

Maditinos et al. (2011) conducted research in Greece related to INTC and CP and concluded that there exists a significant positive relationship between INTC and CP. They further comprehend that the role of HC is more dominant in deciding a firm's success as compared to other components of INTC. Latif et al. (2012) examine the effect of INTC on market value determination of the firm. In this study, VAIC was used to measure patterns of INTC in which HC, SC, and RC were used to measure INTC. Results exhibit that all INTC components have a significant positive impact on the market value of firms. Lerro et al. (2014) utilized Romanian firms to investigate the relationship between INTC and CP. They used the VAICTM model to analyze the said relationship and concluded there was a negative relationship between the components of INTC and the performance of the firm. They further argued that poor utilization of INTC in organizational setup is the reason for the negative linkage between said relationships. Ghosh and Mondal (2009) considered the pharmaceutical sector of India to explore the impact of INTC on market value and profitability of the firms. Results of the study conclude that INTC does influence the profitability of the pharmaceutical sector, but no significant relationship was found between INTC and the market value of any firm in the pharmaceutical sector.

Lu et al. (2021) employed a modified VAIC model to assess the effect of INTC on company performance in China by using four components; HC, SC, RC, and innovation capital. Between 2014 and 2018, listed Chinese companies provided the data. The study used the Generalized Method of Moments and a pooled OLS model (GMMs). The study's conclusions showed that INTC and its parts can enhance Chinese company performance. In their study of the impact of INTC on business performance, Wang et al. (2021) took the mediating roles of innovation speed and quality into account. On the basis of the INTC perspective and innovation literature, the study constructed a research model. Structural equation modelling was utilized in the study to analyze data gathered from 328 Chinese high-tech companies. The findings demonstrated a favorable relationship between the three INTC components; HC, SC, RC, and innovation speed and quality, which in turn helps a firm perform better operationally and financially. Ge and Xu's (2021) goal is to methodically examine the connection between INTC and business performance as shown by

earnings, profitability, corporate return, sales growth, productivity, and market value. In order to calculate INTC, one uses the Modified Value Added Intellectual Coefficient (MVAIC). With data taken from a sample of 204 Chinese pharmaceutical listed businesses between 2013 and 2018, multiple regression models are used. The results indicate that enterprises' earnings, profitability, corporate return, and productivity are positively impacted by the total INTC. Ryu et al. (2021) investigated the moderating role of alliance proactiveness in the relationship between relational capital and technological innovation capability on international performance. By using hierarchical regression analysis on data gathered from 175 SMEs, the research study hypotheses were put to the test. According to the main research findings, relationship capital and alliance proactiveness are the most important elements of international performance since they enhance the capacity for technological innovation.

Vishnu and Gupta (2014) carried out a study to explore the impact of INTC on the CP of the pharmaceutical sector by taking structural and HC to measure INTC. Findings of the study reveal that it is HC that effects profitability, whereas SC has no significant contribution towards a firm's success and profitability. Phusavat et al. (2011) investigated the relationship between INTC and the CP of manufacturing sector firms in Thailand. Results of their research reveal that INTC significantly impacts the overall performance of the firms, including ROA, profitability, employee productivity, etc. Rahman (2012) investigated the impact of INTC on a firm's performance by taking into account 100 UK companies from three industries that are listed on the London stock exchange by utilising VAICTM. The findings indicate that INTC and the firm's performance are positively related. Joshi et al. (2013) carried out research related to INTC and performance in the context of the Australian service sector by using structural, human, and RC as components of INTC. Empirical findings of the research demonstrate that HC is the main contributor in order to enhance the performance of an organization. Saruchi et al. (2019) examined the relationship between INTC and CP with reference to Islamic banks. They concluded that HC was the main and sole contributor to the firm's success. They further extend their analysis by proposing that the majority of studies show that HC is a major performance enhancer in the context of the financial sector. Innayah et al. (2020) investigated the impact of INTC on CP by using a sample of ASEAN countries, namely Indonesia, Philippines, Malaysia, Singapore, and Thailand, over the time span of 2012–2016. Their findings demonstrate that there exists a direct relationship between INTC and CP. They further explained that by using INTC more efficiently, firms can achieve higher performance. Existing literature demonstrates mixed findings related to INTC and CP, but the relationship is significant in previous studies. Hence, the proposed hypothesis of this study is as follows:

H1: There is a significant positive relationship between relational capital and CP in Pakistan.
H2: There is a significant positive relationship between human capital and CP in Pakistan.
H3: There is a significant positive relationship between structural capital and CP in Pakistan.

3. Methodology

3.1. Research Framework

In order to measure and value INTC, numerous measurement models have evolved over time and disciplines (Andriessen, 2004; Bontis, 2001; Bontis et al., 2007; Janosevic&Dzenopoljac, 2012). This study used VAICTM, which is considered the most important, latest, and frequently used

model for measuring the INTC. SC, HC, and RC are components of VAICTM. This study used EPS as a performance indicator of non-financial firms in Pakistan. Numerous research studies used VAICTM to measure INTC, such as (Ahangar, 2011; Haji, 2016; Poh et al., 2018; Scafarto et al., 2016; Zeghal& Maaloul, 2010).

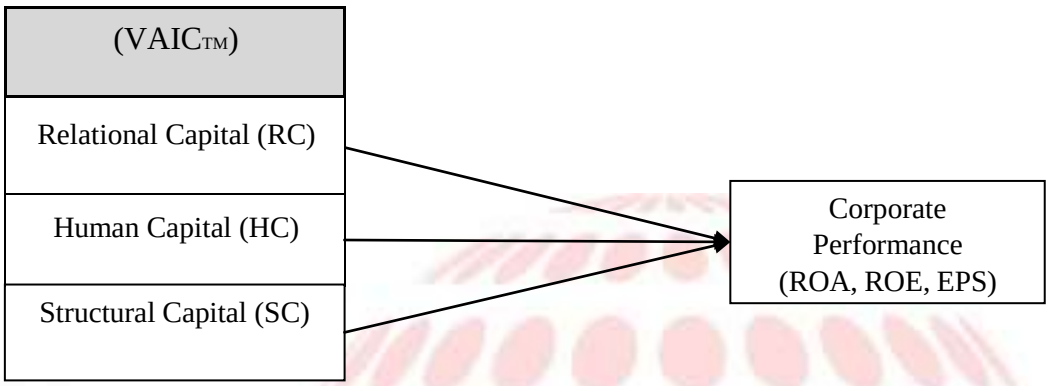

Figure 3.1: Proposed Research Framework

3.2. Research Population, Sampling and Data Analysis Technique

The non-financial firms of PSX make up the study's population, while the non-financial firms listed on PSX's KSE-100 index make up the study's sample. The KSE-100 index is used as a representative sample since it has the largest market capitalization and includes the best-performing stocks across all industries. The secondary data used in this study was gathered from the annual reports of non-financial companies listed on the KSE-100 index between 2012 and 2019. Moreover, firms that are de-listed by the KSE-100 index and firms that have incomplete or no information are eliminated from the sample of the study. Baltagi (2008) stated that the FEM and the REM are the two most commonly and frequently used panel data estimation techniques. In the FEM, the intercept may change across individuals, but it remains the same over time. Random variation among some model parameters represents the random effects model (Gujarati, 2009). The equation is as follows:

$$CP = \beta 0 + \beta 1RCEit + \beta 2HCEit + \beta 3SCEit + \mathcal{E}t \quad (1)$$

Where;
CP is yearly corporate performance
β0is the fixed intercept
RCE is capital employed efficiency
HCE is Human Capital efficiency
SCE is Structural Capital efficiency
Ɛ is the error term

3.3. Dependent Variables

Corporate performance, the study's dependent variable, is the extent to which organizations successfully achieve their deliberated aims and objectives (Mia & Clarke, 1999). EPS is used in

this study as a gauge of business performance. This variable is frequently used in research to gauge business performance. EPS essentially calculates the profit per share (EPS) of a corporation.
Earnings per Share = Net Income after Tax/ Total Outstanding Shares

3.4. Independent Variables

Despite the fact that many models have been created to measure INTC, the current study used VAICTM, which was created by Pulic (2004). Additionally, the impact of each variable on the performance of non-financial enterprises listed on the KSE-100 index of PSX is investigated using the VAICTM components SC, HC, and RC. This research made use of Pulic's VAICTM technology (1998). It is the most popular and commonly used model to measure INTC, claim Firer and Williams (2003). The association between INTC and company performance has also been studied in a number of well-known research using the VAICTM model (Dadashinasab& Sofian, 2014; Poh et al., 2018; Razak et al., 2016). This study utilizes SC, HC, and RC as components of VAICTM. The following equation algebraically formalizes the VAICTM relationship:

VAICTM = SCE + HCE + RCE

Where;
VAICTM = Value Added IC of non-listed firms
RCE = RC Efficiency of non-financial firms
HCE = HC Efficiency of non-financial firms
SCE = SC Efficiency of non-financial firms

3.4.1. Relational Capital Efficiency

RCE refers especially to the expertise connected to customer relationships based on brand value and customer service (Bontis, 1998, 2001; Hormiga et al., 2011; Ismail, 2005; Roos et al., 1997). RCE is calculated as a ratio of total VA divided by total capital employed (CA), where CA is the book value of the firm's assets, according to Pulic (1998). In algebra, RCE is denoted by:

RCE = VA/CE

Where;
VA = Value Added of non-financial firms
CE = Book value of net assets of non-financial firms

3.4.2. Human Capital Efficiency

"A component of INTC that comprises of skills, experience, and knowledge acquired by employees and that travels with them" is how HCE is described (Bontis, 1998; Mojtahedi, 2013). Total VA divided by the sum of all salaries and wages paid out by the company to its employees is used to compute HCE. Below is a display of the HCE computation.

HCE = VA/HC

Where;
VA = Value Added of the non-financial firms
HC= Total Salaries and Wages expense of the firm

3.4.3. Structural Capital Efficiency

Described as "all the unique processes that a corporation can attain and hold via research and development and protect these processes with the aid of patents and copyrights," this is an intangible asset that remains in the control of the company (Khalique, 2012; Mojtahedi, 2013; Nadeem, 2016). The firm's SC must first be determined in order to compute SCE. SC was defined by Pulic (1998) as the discrepancy between a firm's total VA and HC. Which is:

SC = VA – HC

Where;

VA = Value of the non-financial firms

HC = Total Salaries and Wages expense of the firm

4. Data Analysis and Findings

4.1. Descriptive Statistics

Descriptive statistics are used to exhibit quantitative descriptions in manageable form. Descriptive statistics provide help in the simplification of large amounts of data in a sensible manner. In simple words, descriptive statistics present basic features of the data by reducing larger datasets into simple summaries (Fisher & Marshall, 2009). Descriptive statistics of variables under study for non-financial sectors of the KSE-100 index are presented in table 4.1 to better understand the behavior of variables.

Table 4: Descriptive Statistics

	CP	RCE	HCE	SCE
Mean	1.120	0.120	0.778	-0.135
Median	1.180	0.153	0.676	-0.099
Maximum	2.509	0.300	2.681	0.311
Minimum	-2.397	-1.135	-0.019	-2.155
Std. Dev.	0.630	0.177	0.826	0.179
Skewness	-0.264	-0.539	-0.207	-0.940
Kurtosis	0.412	0.885	0.242	0.555
Observations	456	456	456	456

Table 4.1 exhibits the descriptive statistics results of the non-financial sector of the KSE 100 index. All these variables show 456 annual observations. The results for CP data over a period of time exhibit a mean of 1.120, which represents the average value, and a median of 1.180, which shows the middle value after sorting the data. The range of the CP data shows minimum and maximum values, which are -2.397 and 2.509, respectively. The data set shows that the standard deviation is 0.630, which shows a deviation from the mean of the sample. The value of skewness for CP is-0.264 while the value of kurtosis is 0.412, which represents the normal distribution of data. RCE shows a mean of 0.120, a minimum value of -1.135, a maximum of 0.300, and a standard deviation of 0.177, respectively. The series of HCE shows a mean value of 0.778, a maximum value observed in this series is 2.681, and a minimum value of -0.019, along with a standard deviation of 0.826, respectively. The series of SCE represents a mean of -0.135, which represents the average annual value of SCE over a sample period. The maximum and minimum values are 0.311 and -2.155, respectively. The standard deviation is 0.179, which shows deviation from the sample mean.

4.2. Unit Root Test

In this study, the ADF (Dickey & Fuller, 1979) and PP (Phillips & Perron, 1988) tests are employed to examine the stationarity of the data. Table 4.2, which summarizes the results of the unit root test, demonstrates that all the variables are stationary and prepared for further investigation.

Table 4.2: Unit Root Test

Variables	Statistic Values		Probability	Conclusion
CP	ADF	-8.736	0.0000	I(0)
	PP	10.310	0.0000	I(0)
RCE	ADF	-7.698	0.0000	I(0)
	PP	-8.335	0.0000	I(0)
HCE	ADF	-7.264	0.0000	I(0)
	PP	-9.635	0.0000	I(0)
SCE	ADF	-7.137	0.0000	I(0)
	PP	-9.813	0.0000	I(0)

4.3. Hausman Test

Between the FEM and the REM Hausman test is used to determine which model is more appropriate.Table 4.3 presents the Hausman test results. According to the findings, the FEM is appropriate for regression analysis of KSE-100 index companies in the non-financial sector.

Table 4.3:Hausman Test

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-Section Random	12.210	3	0.0002

4.4. Fixed Effects Model

The current study used a FEM for regression analysis and the results are reported below in table 4.4 for non-financial firms of the KSE-100 index.

Table 4.4: Fixed Effect Model

Variable	Coefficient	t-Statistic	Prob.
Constant	0.392	4.653	0.000
RCE	0.226	2.677	0.045**
HCE	0.951	10.792	0.000*
SCE	0.978	3.270	0.001*
R-squared		0.882	
F-statistic		39.32*	
No. observations		456	

* and** indicates significance at 1% and 5% level, respectively

Table 4.4 presents the findings of the regression analysis for businesses in the non-financial sector. As a measure of INTC, the current study used RCE, HCE, and SCE as independent variables and CP as a dependent variable. The model has 456 annual observations for the eight-year period from 2012 to 2019. The direction of the link between the underlined variable and the dependent variable is shown by the sign of the coefficient. Because of this, a positive coefficient

sign denotes a positive association and vice versa. As indicated in the table, RCE, HCE, and SCE all have positive coefficient signs in relation to CP, as indicated in the table, indicating that they are positively associated with CP at significance levels of 5% and 1%, respectively. The variation of the dependent variable that is explained by the independent variable is represented by the R squared value. R squared in this situation is 88.2%, which is a high figure. The F-value statistic's and significance reflect how well explanatory factors can account for the outcome variable. The F-statistic score in this instance is 39.32, which at a 1% level of significance is statistically significant.

5. Conclusion and Implication

INTC is considered the focal point of many businesses and government organisations and a clear source of achieving competitive advantage, but it is not widely explored and studied specifically in emerging and developing economies. The findings of the current study show that INTC has a strong and significant association with the CP of the non-financial sector of the KSE-100 index. The underline relationship exists because, in this recent era of innovation, knowledge is considered one of the most significant features that contribute to firms' value creation process.
The current study extends the literature in the domain of an important research area for a developing country like Pakistan, where insufficient knowledge and related evidence exists. This study practically contributes to understanding and managing human resource management development and its implications. The underlining relationship will not only comprehend the importance of human resources in value creation for organisations but also guide practitioners and human resource managers about managing and retaining human resources as they are a valuable source for an organization. This study will also assist non-financial firms in their policy formulation and procedures related to capital structuring, which will assist them to enhance their firms' performance.

The current study extends the literature in the domain of an important research area for a developing country like Pakistan, where insufficient knowledge and related evidence exists. The management of non-financial firms will also benefit from this study as they can take corrective actions on their existing policies and procedures and make them competent. Moreover, managers and investors analysed the contribution of each component of INTC (structural, human, and relational) in the firms' performance. That shows which INTC is fruitful and how much investment should be made in each component. This study concluded that HCE significantly impacts CP, so regulatory bodies such as the Securities and Exchange Commission of Pakistan (SECP) should encourage the establishment of standards for identification and measurement of human resources. This will increase human capital valuation and allow more reliable comparison of human capital values. SECP and other government regulatory bodies can use the findings of this study in order to evaluate the efficiency of IC as an integral part of a firm's performance, which helps in regulating or listing-delisting of firms.

The study focused on non-financial firms that are listed in the KSE-100 of PSX. However, future research can be carried out by taking financial sector firms as well as a comparison of financial and non-financial firms. Moreover, all listed firms of PSX could be used despite only having the KSE-100 index in order to get more generalised results. The current study utilised secondary data in order to obtain a quantitative measurement of INTC. Therefore, the usage of primary data is an

improvement in research as this will improve the reliability of statistical tests and give a better understanding of the impact of INTC on CP. The current study was carried out in the context of PSX. Therefore, the findings of this study may be applicable to similar emerging markets but not generalised to other stock markets in the world. Hence, an extension would be carried out by exploring differences and similarities with other emerging stock markets.

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