Extended Value-Added Intellectual Coefficient and Financial Reporting Quality: Moderating Role of Global Financial Crisis

Dr. Muhammad Irfan
Assistant Professor, Institute of Banking & Finance, Bahauddin Zakariya University, Multan, Pakistan

Memoona Kausar*
Bahauddin Zakariya University, Multan, Pakistan

Dr. Muhammad Shaukat Malik
Professor, Institute of Banking & Finance, Bahauddin Zakariya University, Multan, Pakistan

Abstract
Besides traditional approaches, this study aimed to construct and validate the new model of intellectual capital and financial reporting quality and created a deeper and better understanding through the use of rigorous secondary data. It adopted new formula of intellectual capital instead of traditional primary measures and explored the role of financial reporting quality in financial success of firms. Study is helpful for decision makers, especially from the manufacturing sector, to mould their practices accordingly and they will also realize the importance of high financial reporting quality. The study used Three-stage least squares regression analysis to investigate the relationship between variables. Extended Value-Added Intellectual Coefficient method is used to measure intellectual capital and discretionary revenues method is used to measure financial reporting quality. Panel data was collected from 50 firms, included in fortune global 500 companies list from 2007 to 2017. Findings disclosed that intellectual capital and process capital has a significant impact on financial performance. Human capital and relational capital negatively influence however, innovation capital and financial reporting quality positively influence financial performance. Global Financial Crisis positively moderates the effect of intellectual capital on financial performance but it doesn't moderate the effect of financial reporting quality on financial performance.
Keywords: Financial Reporting Quality, Intellectual Capital, Global Financial Crisis, Financial Performance, Three-stage least squares regression
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Introduction
This study is predominant as the issue of intellectual capital was of great attention for scholars from last ten years (Hamdan, 2018). The purpose of financial reporting is to make available financial facts about the organizations that are useful to lenders, potential and existing investors, and other creditors in making decisions about investing resources to the firms. So, aim of the paper is to test the effect of financial reporting quality (FRQ) and intellectual capital (IC) on financial performance and moderating effect of global financial crisis (GFC) between financial reporting quality, intellectual capital and financial performance of fortune 500 companies. Fortune 500 companies list is ranking of top 500 companies which earned the highest revenue. Companies have many resources and advanced technology. The list is published in Fortune magazine every year. IC is knowledge-intensive intangible assets that included in a corporation that consist of intellectual competencies, intellectual property and intellectual resources (Chen *et al.,* 2014). IC has three main elements; these are structural capital, relational capital and human capital (Jardon & Dasilva, 2017). Biddle *et al.* (2009) explained FRQ as accuracy's level in managing information relevant to cash flows of corporations. Low profit corporations do not make fair financial reports and prepare it difficult for financiers to understand the real picture (Lin *et al.*, 2014). Some organizations do not present R&D expenditures separately in their annual reports and it is frequently part of the human resource development or investment (Phusavat *et al.,* 2011). Inkinen (2015) presented publication frequency of IC's components through the graph and mentioned that innovation capital is the most scarcely discussed element and even process capital is not included in the list. Martinez-Ferrero (2014) examined association of FRQ and firm performance measured by dividing market and book which is a market measure so scholar recommended that accounting measures are required to measure the firm performance. So, test of association of FRQ on financial performance is needed. By literature it is clear that GFC 2007-09 badly disturb financial position of organizations and countries' economy. Financiers can alter their priorities and pattern of resources allocation.

Literature review and Hypotheses Development
Ding (2010) explored that firstly, John Kenneth Galbraith presented the term of intellectual capital (IC) in 1969. In the definition of IC, Stewart (1997) incorporated information, intellectual property, expertise, education, knowledge and experience. In the perspective of Western European, IC is a vibrant source for the generation of

firms' value (Sardo & Serrasqueiro, 2017). Influence of IC on organizational performance is stronger in the knowledge-based firms than the traditional firms in India (Maji & Goswami, 2016). But Morariu (2014) insisted that IC has an inverse relationship with market value and has an insignificant link with return on equity of Romanian firms. Ozkan *et al.* (2017) insisted that there is a strong association between financial performance (Return on Assets) and IC of Turkish Banks. IC has a positive effect on organizational performance (Pucci *et al.*, 2015; Khalique *et al.*, 2015). Nevertheless, Study derived that the IC has no influence on firm performance (Earnings per Share, Tobin's Q) of listed Tehran Stock Exchange firms (Vazifehdoust *et al.*, 2014). Moreover, IC has a positive influence on corporate return and profitability (Jordão & Almeida, 2017). In addition to, IC has a positive relationship with accounting measures (return on assets). However; IC has not correlated to the market performance of corporations in Bahrain and Saudi Arabia (Hamdan, 2018). IC has a strong effect on financial performance (return on assets, return on equity) of banks (Al-Musali & Ismail, 2016). But, Celenza and Rossi (2014) investigated that there is no positive association between IC, return on investment, market to value, return on equity and return on sales within Italian firms. IC has a strong positive influence on financial performance and market value of non-financial firms of Western Europe (Sardo & Serrasqueiro, 2017). Similarly, IC has a significant influence on firm's performance of technology industry (Nimtrakoon, 2015), pharmaceutical in India (Sriranga & Vijay, 2014) and SMEs of Portugal (Ferreira & Franco, 2017).

H₁: Intellectual capital has a significant effect on financial performance.

Human capital (HC) is a main element for value generation in this knowledge-based era. Human assets consist of expertise, managerial skills, creativity, entrepreneurial, leadership and competence of problem-solving having by the personnal of the organizations (Brooking, 1996). Creative ideas, professional skills, work experience and knowledge increased operational and financial performance of the corporations (Wang *et al.*, 2014). HC positively influence the performance of Russian firms (Andreeva & Garanina, 2016). Similarly, HC has positive influence on the financial performance of banks of Turkey (Ozkan *et al.*, 2017). But, Chu *et al.* (2011) described that there is no link of HC with assets turnover of listed firms of Hong Kong. Higher the level of HC, the higher is level of organizational performance of Iranian listed firms (Asiaei & Jusoh, 2015). But, the association between HC and firm performance is insignificant in Malaysian firms (Hashim *et al.*, 2015). Wang *et al.* (2014) found a strong positive association between the financial performance and HC of technology firms in China. Moreover, HC has a strong positive influence on the bank's performance in Luxembourg and Belgium (Mention & Bontis, 2013). HC has significant positive relationship on firm performance of steel and engineering firms in India (Maji & Goswami, 2016), Iranian chemical and pharmaceutical industry (Salehi et al., 2014), Malaysian Listed Companies (Abdullah & Sofian, 2012), Greek firms from different industries (Maditinos *et al.*, 2011).

H₁ₐ: Human capital has a significant effect on financial performance.

Structural Capital (SC) is the knowledge that kept with the organiztion when human resource goes home (Roos *et al.,* 1998). SC has a significant effect on performance of firm (Khalique *et al.*, 2015; Gogan *et al.*, 2016; Sriranga & Vijay, 2014; Cabrita & Bontis, 2008). SC is divided into relational capital and organizational capital. Organizational capital is divided into innovation capital and process capital (Su *et al.*, 2013; Sumedrea, 2013; Bontis, 2001; Cohen & Kaimenakis, 2007; Namvar *et al.*, 2012).

Relational capital (RC) described as ability of a firm to work together with stakeholders of outside organization e.g. suppliers, competitors, industry associations, customers and trade (Edvinsson & Malone, 1997). By developing RC, firms may found various better ways of business operating by getting knowledge from other people experiences and can be more innovative (Cousins *et al.*, 2006). RC by using measurements of agencies, agencies' skills and market share has a strong positive impact on organization efficiency of Iranian insurance companies (Zakery & Afrazeh, 2015). On the contrary, RC has not positive significant influence on the financial performance of the technology industry of five stock exchanges (Nimtrakoon, 2015). RC increases operational and financial performance of technology corporations (Wang *et al.*, 2014). RC has a significant influence on business performance of Romanian drinking water firms (Gogan *et al.*, 2016), non-financial firms of Western Europe (Sardo & Serrasqueiro, 2017), Iranian chemical and pharmaceutical industry (Salehi *et al.*, 2014), Malaysian Listed Companies (Abdullah & Sofian, 2012), Portuguese financial services Sector (Cabrita & Bontis, 2008), Iranian public listed firms (Asiaei & Jusoh, 2015). However, Andreeva and Garanina (2016) demonstrated that RC has not positive effect on the organizational performance of Russian manufacturing companies, as in Russia RC is so extraordinary that it doesn't present as a competitive advantage.

H₁ᵦ: Relational Capital has significant effect on financial performance.

Innovation capital (InC) described as the capability of the corporation to use current knowledge to produce knowledge, new products, ideas and technologies (Maditinos *et al.*, 2010). Nowadays innovation is a requirement for each organization because of the fast growth of technology, globalization and market competition. Innovation can influence the organization's long-term success (Naranjo-Valencia *et al.*, 2016). A corporation can decrease the production cost with technological innovation and gain more profit with product innovation (Chen *et al.*, 2004). Process and product innovation have significant positive whereas marketing and organizational innovation has non-significant effect on corporate performance (Atalay *et al.*, 2013). HC significantly influences InC (Namvar *et*

al., 2012). InC has a positive association with performance (return on assets, profitability and return on investments) of Taiwan's IT/electronic industry (Chiou & Chen, 2012). On the contrary, InC has no impact on market value (Ferraro & Veltri, 2011). Moreover, Maditinos *et al.* (2010) mentioned that InC has a positive relation on SC. But, Jiang *et al.* (2013) discussed that there is an inverse association between innovation performance and partnering with other corporations via alliances. InC has insignificant impact on return on equity, employee productivity and return on assets; on the contrary there is a positive inflence on revenue growth of Thailand firms (Phusavat *et al.*, 2011). Expenses of R&D has strong linked with the future performance of Chinese corporations (Ruiqi *et al.,* 2017).

H$_{1c}$: Innovation capital has significant effect on financial performance.

Process capital (PrC) is related to procedures, formulas, work instructions, standards, charts, guidelines and techniques that increase the efficiency of transfer of services and goods to customers (Laitinen, 2009). PrC is the procedures, techniques and systems which a corporation adopts to attain process quality and operational efficiency (Scafarto *et al.*, 2016). PrC can influence firm performance by increasing customer performance and minimizing the cost of operations (Cheng *et al.*, 2010). Moreover, Indicators of national IC, i.e. InC, market capital, PrC and HC has a strong positive effect on GDP per capita (Phusavat *et al.*, 2012). Moreover, IC with elements of InC, HC, PrC and customer capital has positive association with innovation, knowledge management, learning organization and self-directed learning (Phusavat *et al.*, 2013). PrC is the main element of IC that affects Taiwan's Public Accountants firms in holding high operating performance (Lee & Lin, 2018). Similarly, Namvar *et al.* (2012) indicated that HC significantly effect PrC in Iranian IT companies. However, PrC has non-significant impact on the market value of Italian listed firms (Ferraro & Veltri, 2011). Small power distance, individualism and Weak uncertainty avoidance are helpful to the generation of PrC (Lee *et al.*, 2017).

H1$_d$: Process capital has significant effect on financial performance.

Financial reports are information resources available to capital markets and it plays an effective role in investment development (Iatridis, 2010). Peek *et al.* (2010) mentioned that nonpublic organizations involved in short informative financial transparency than public listed firms. Financial disclosure's quality has non-significant association with stock return of corporation (Salehi *et al.*, 2018). FRQ has a positive significant effect on investment efficiency (Mohammadi, 2014; Chen *et al.*, 2011). Practices of corporate governance have a strong positive effect on transparency of information of non-financial listed firms (Kachouri & Jarboui, 2017). But, larger firms and ownership concentration have an inverse impact on FRQ (Yasser *et al.*, 2017). In addition to, audit committees play a key role in regulating low FRQ and bring back the user's confidence in financial reports (Salehi & Shirazi, 2016). FRQ has a strong positive influence on corporate dividend policy (Koo *et al.*, 2017). Nevertheless, FRQ has an inverse association with the family firm's investment behavior and when a member of family acted as the CEO, there is insignificant impact of FRQ on investment decision (Lin *et al.*, 2016). The internal control system's Implementation, internal accountant's competence and commitments of internal managers to the company has a strong effect on the FRQ (Setiyawati, 2013). On the contrary, corporate governance has no significant association with FRQ (Honu & Gajevszky, 2014). By high FRQ, information asymmetry may be reduced between SMEs and their creditors (Bauwhede *et al.*, 2015). In addition to, there is an inverse influence between FRQ and innovation (Lobo *et al.*, 2018). Kardan *et al.* (2016) mentioned that FRQ on the basis of qualitative characteristics has a positive influence and on basis of Dechow and Dichev (2002) model, FRQ has an inverse influence on debt financing. Moreover, FRQ has a negative influence on equity financing. After the adoption of IFRS, there is positive association between board governance and accounting information's quality (Krismiaji *et al.*, 2016).

H$_2$: Financial reporting quality has a significant effect on financial performance.

Global financial crisis (GFC) started in 2007's fourth quarter and continued to disorder the financial system until 2009's second quarter. Dwyer and Lothian (2012) claimed that GFC was in the retrieval stage by 2011. After depression of the 1930s, GFC 2007–08 is called the worst crisis (Reinhart & Rogoff, 2013). The growth of corporations was affected by HC and SC and new concepts and ways for operating firms were emerged and developed during GFC (Sumedrea, 2013). GFC has no link with disclosures of IC in corporations of Portugal (Rodrigues *et al.*, 2017). Market structure and GFC have a significant effect on IC in UAE (El-Bannany, 2012). Because of GFC, countries face long time period unemployment and reduction in consumer's spending, housing foreclosures and business investment (Reinhart & Rogoff, 2009). Social capital has a positive impact on a firm's stock returns during GFC (Lins *et al.*, 2017). Mostly Thai corporations kept safe from GFC because they don't deleverage and liquidate their assets (Vithessonthi and Tongurai, 2015). Despite independent boards and high institutional ownership, organizations got lower returns of stock during GFC (Erkens *et al.*, 2012). Capital markets progressed in harmonization and stock's prices in world reduce by thirty percent or more during GFC (Bartram and Bondar, 2009). When the crisis increases, banking sector was the most affected sector (Cecchetti, 2009). Leverage has a strong impact on the performance of small enterprises but, there is a negative influence of Leverage on the performance of large corporations during GFC in Thailand (Vithessonthi & Tongurai, 2015). Kehelwalatenna (2016) explained that there is a worsening of the IC's reputation during the GFC in banks of New

York.

H₃: Global Financial Crisis has moderating effect between intellectual capital and financial performance.

H₄: Global Financial Crisis has moderating effect between financial reporting quality on financial performance.
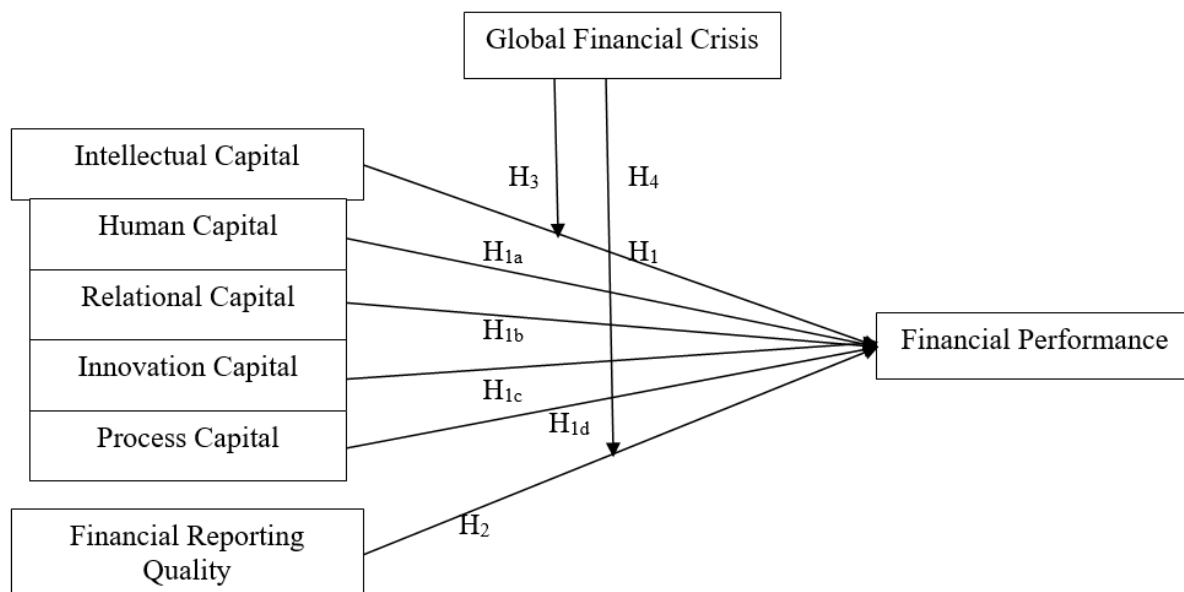

Figure 1: The Research Model

Research Methodology

This study employed a rigorous research methodology. It is a quantitative research using panel data. For regression analysis of panel data, EViews is used. Research hypotheses are tested using Three-stage least squares regression analysis. For this causal study, 50 companies are selected, of which 17 are from pharmaceutical industry, 16 are from electronics industry and 17 are from chemical industry. Selected companies earned highest revenue during 2016 to 2018. Data is collected of last eleven years i.e. from 2007 to 2017. The financial data is composed from annual financial reports and annual reports are available on firm' official websites. According to law, these financial reports should use standard accounting principles and practices and should be audited. That's why we are assuming that our data is reliable and our results should be verifiable. To measure the intellectual capital efficiency, Pulic (1998) presented a method with parts of financial capital, value added and intellectual capital. This method is named as Value-Added Intellectual Coefficient (VAIC). Many researchers have used VAIC method (Sriranga and Vijay, 2014; Sardo & Serrasqueiro, 2017; Ozkan *et al.*, 2017; Salehi *et al.*, 2014; Maji & Goswami, 2016; Singh *et al.*, 2016; Maditinos *et al.*, 2011; Mondal and Ghosh, 2012). So, this method is most reliable method.

VAIC = (Value Added/Human Capital + Structural Capital/ Value Added) + Value Added /Capital Employed

Nazari and Herremans (2007) extended the pulic's VAIC method and integrated innovation, process and relational capital into VAIC model. So, this study used an extended Value-Added Intellectual Coefficient method (eVAIC).

eVAIC = {Value Added /Human Capital + (Relational Capital/Value Added + Innovation Capital/Value Added + Process Capital/Value Added)} + Value Added/Capital Employed

Discretionary revenues method is used to measure financial reporting quality (Yasser *et al.*, 2016; Stubben, 2010). GFC is a dummy variable. GFC is codded 1 during the period of GFC 2008-09 and otherwise 0 (El-Bannany, 2012; Al-Musali and Ismail, 2016).

To measure financial performance, Dividend payout ratio (DPR), Firm growth rate (FGR), Return on capital employed (ROCE) and Employee productivity (EP) is used. The dividend payout ratio is computed by dividing dividend per share to earnings per share (Enekwe *et al.*, 2015). Firm Growth Rate is computed by subtracting logarithm of the total sale of last year from the logarithm of the total sale of the current year (Colombelli, 2015). Return on capital employed is computed by dividing earnings before interest and tax to capital employed (Bhatt & Bhattacharya, 2015). Employee productivity is computed by dividing profit before tax to a total number of employees (Clarke *et al.*, 2011). Control variables are Firm leverage (FL), firm size (FS) and firm age (FA) in this study. Firm Leverage is computed by the dividing total debt and total assets (Shiu, 2006; Clarke *et al.*, 2011). Firm Age is computed by a number of years since the firm's startup date (Díaz-Fernandez *et al.*, 2015; Hamdan, 2018). Firm size is computed by the natural logarithm of the book value of total assets (Alipour, 2012).

Following regression models are developed in study:

Table 1: Regression Models

Model	Regression Equation
1	$FGR = \beta_0 + \beta_1 (FRQ_{i,t}) + \beta_2 (eVAIC_{i,t}) + \beta_3 (FS_{i,t}) + \beta_4 (FL_{i,t}) + \beta_5 (FA_{i,t}) + \varepsilon_{i,t}$
2	$DPR = \beta_0 + \beta_1 (FRQ_{i,t}) + \beta_2 (eVAIC_{i,t}) + \beta_3 (FS_{i,t}) + \beta_4 (FL_{i,t}) + \beta_5 (FA_{i,t}) + \varepsilon_{i,t}$
3	$EP = \beta_0 + \beta_1 (FRQ_{i,t}) + \beta_2 (eVAIC_{i,t}) + \beta_3 (FS_{i,t}) + \beta_4 (FL_{i,t}) + \beta_5 (FA_{i,t}) + \varepsilon_{i,t}$
4	$ROCE = \beta_0 + \beta_1 (FRQ_{i,t}) + \beta_2 (eVAIC_{i,t}) + \beta_3 (FS_{i,t}) + \beta_4 (FL_{i,t}) + \beta_5 (FA_{i,t}) + \varepsilon_{i,t}$
5	$FGR = \beta_0 + \beta_1 (FRQ_{i,t}) + \beta_2 (HC_{i,t}) + \beta_3 (RC_{i,t}) + \beta_4 (InC_{i,t}) + \beta_5 (PrC_{i,t}) + \beta_6 (FS_{i,t}) + \beta_7 (FL_{i,t}) + \beta_8 (FA_{i,t}) + \varepsilon_{i,t}$
6	$DPR = \beta_0 + \beta_1 (FRQ_{i,t}) + \beta_2 (HC_{i,t}) + \beta_3 (RC_{i,t}) + \beta_4 (InC_{i,t}) + \beta_5 (PrC_{i,t}) + \beta_6 (FS_{i,t}) + \beta_7 (FL_{i,t}) + \beta_8 (FA_{i,t}) + \varepsilon_{i,t}$
7	$EP = \beta_0 + \beta_1 (FRQ_{i,t}) + \beta_2 (HC_{i,t}) + \beta_3 (RC_{i,t}) + \beta_4 (InC_{i,t}) + \beta_5 (PrC_{i,t}) + \beta_6 (FS_{i,t}) + \beta_7 (FL_{i,t}) + \beta_8 (FA_{i,t}) + \varepsilon_{i,t}$
8	$ROCE = \beta_0 + \beta_1 (FRQ_{i,t}) + \beta_2 (HC_{i,t}) + \beta_3 (RC_{i,t}) + \beta_4 (InC_{i,t}) + \beta_5 (PrC_{i,t}) + \beta_6 (FS_{i,t}) + \beta_7 (FL_{i,t}) + \beta_8 (FA_{i,t}) + \varepsilon_{i,t}$

Note: Model 1, 2, 3 and 4 examine the relationships between IC and financial performance. The last four models (Models 5, 6, 7 and 8) are used to analyze each of the four components of IC on the dependent variable.

Results and Discussion
This paramount study undertook normality, unit root, heteroscedacity, multicollinearity, outliers, autocorrelation and endogeneity tests to ensure the quality of data and variables.

Table 2: Descriptive Statistics

Variables	N	Mean	Median	Maximum	Minimum	Std.Dev.	Skewness	Kurtosis
eVAIC	547	1.5344	1.3494	3.6721	0.3471	0.6287	0.8381	3.3681
HC	550	0.0856	0.0801	0.3275	0.0022	0.0657	0.6882	2.6755
RC	550	0.1284	0.1174	0.4745	0.0074	0.0757	0.9384	4.6196
InC	550	-3.3881	-3.2441	-1.6550	-6.3288	0.8658	-0.7988	3.3852
PrC	550	1.3484	1.3155	3.6398	-0.4243	0.6801	0.0739	3.8552
FRQ	550	-4.6822	-4.5427	-0.9606	-11.205	1.4215	-0.7395	4.7242
GFC	550	0.1818	0	1	0	0.3860	1.6499	3.7222
FGR	550	0.0199	0.0182	0.4715	-0.3095	0.0676	0.6765	10.543
DPR	497	3.6888	3.6956	9.4173	-0.5596	0.8575	0.2942	9.8706
EP	525	4.5571	4.2899	11.215	-1.6094	1.7199	1.1126	5.5888
ROCE	539	-2.1865	-2.1562	0.0048	-6.2619	0.8040	-0.9933	6.7777
FS	550	2.8927	2.8662	3.1996	2.7203	0.1105	1.2531	3.9583
FA	550	86.28	95.5	215	2	51.030	0.1142	2.1847
FL	550	0.6031	0.6190	1.3186	0.2412	0.1361	0.0756	4.6149

Note: As some values of skewness was not lied within recommended range of skewness so adopted log transformation method for extended Value-Added Intellectual Coefficient, innovation capital, process capital, financial reporting quality, dividend payout ratio, employee productivity, return on capital employed and firm size.

Table 2 exhibited the descriptive statistics of the data. The recommended range of skewness is between -1 and +1 (Hair *et al.*, 2006). It is evident from table 2 that values of skewness are between -1 and +1 so after checking normality test, data can be viewed as perfect normal distribution. Charbaji (2011) argues that ratio variables increase skewness in the data so one should log-transform the data for better statistical analysis so, used log transformation where it was needed.

Table 3: Unit Root Test

Variables	Statistics	Prob.
eVAIC	198.491	0.0000*
Human Capital	175.324	0.0000*
Relational Capital	150.706	0.0008*
Innovation Capital	152.998	0.0003*
Process Capital	163.757	0.0001*
Financial Reporting Quality	171.213	0.0000*
Global Financial Crisis	203.008	0.0000*
Firm Growth Rate	217.115	0.0000*
Dividend Payout Ratio	145.288	0.0014*
Employee Productivity	177.670	0.0000*
Return on Capital Employed	210.681	0.0000*
Firm Size	134.948	0.0114**
Firm Leverage	169.057	0.0000*
Firm Age	381.711	0.0000*

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

This study applied ADF - Fisher Chi-square to check problem of unit root in panel data and in table 3, findings

disclosed that data has no unit root problem (Maddala & Wu, 1999). Breusch pagan test proved that there is no heteroscedacity problem in the data. Endogeneity test revealed that all variables are exogenous.

Table 4: Correlation Analysis

Variables	eVAIC	FRQ	Firm Size	Firm Leverage	Firm Age
eVAIC	1				
FRQ	0.01613**	1			
Firm Size	-0.04295**	-0.02673**	1		
Firm Leverage	-0.02594**	0.08155***	-0.04215**	1	
Firm Age	-0.07697***	-0.06312***	-0.19554	0.01920**	1

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

Correlation analysis gives assistance to identify the existence of multicollinearity between variables. Multicollinearity should be considered a serious concern only if the correlation among variables exceeds 0.8 (Kennedy, 1985). From Table 4, it is evident that correlation coefficients range from a low of -0.196 to a high of 0.081.

Table 5: Regression Analysis for Model 1, Model 2, Model 3 and Model 4

	FGR				DPR				EP				ROCE			
Variables	B	Std. Error	t-Statistic	p	β	Std. Error	t-Statistic	p	β	Std. Error	t-Statistic	p	β	Std. Error	t-Statistic	P
Constant	0.528	1.687	0.313	0.755	5.174	1.152	4.492	0.000*	-25.69	1.329	-19.33	0.000*	4.722	0.911	5.184	0.000*
eVAIC	0.061	0.093	0.653	0.514	-0.168	0.062	-2.715	0.007*	0.813	0.073	11.13	0.000*	0.248	0.051	4.816	0.000*
FRQ	0.263	0.043	6.076	0.000*	-0.048	0.027	-1.810	0.071	0.098	0.032	3.044	0.002*	0.007	0.023	0.326	0.744
FS	-0.956	0.549	-1.742	0.082	-0.678	0.378	-1.795	0.073	10.65	0.434	24.51	0.000*	-2.299	0.299	-7.678	0.000*
FL	-0.050	0.241	-0.206	0.837	0.700	0.291	2.400	0.017*	-0.636	0.188	-3.383	0.001*	-0.806	0.239	-3.367	0.001*
FA	-0.049	0.068	-0.731	0.465	0.001	0.001	1.203	0.230	-0.400	0.052	-7.705	0.000*	-0.001	0.001	-2.209	0.028*
R²			0.100440				0.045645				0.633726				0.152917	
Adjusted R²			0.087981				0.035927				0.630198				0.144970	
S.E. of regression			1.104291				0.842035				1.045950				0.743483	

From Table 5, it is demonstrated that there is no significantly association of eVAIC with firm growth rate (β=0.061, P=0.514) but eVAIC is significantly (P=0.007) and negatively (β=-0.168) related to the dividend payout ratio. It shows positive relationship with EP (β=0.813, P=0.000) and return on capital employed (β=0.248, P=0.000). So, null hypothesis H₁ is rejected. Findings proved the significance of IC in the achievement of firms. In this age, intangible assets are also required to gain competitive advantage and to attain highest profits. Nevertheless increase in investment on IC can minimize the dividend payout ratio. FRQ has a strong positive effect on firm growth rate (β=0.263, P=0.000) and employee productivity (β=0.098, P=0.002). However, it has an insignificant effect on dividend payout ratio (β=-0.048, P=0.071) and return on capital employed (β=0.007, P=0.744).

Table 6: Regression Analysis for Model 5, Model 6, Model 7 and Model 8

	FGR				DPR				EP				ROCE			
Variables	β	Std. Error	t-Statistic	p	β	Std. Error	t-Statistic	p	β	Std. Error	t-Statistic	p	β	Std. Error	t-Statistic	p
Constant	-0.047	1.723	-0.027	0.978	6.227	1.244	5.005	0.000*	-22.64	1.465	-15.45	0.000*	5.938	0.948	6.260	0.000*
HC	-0.001	0.068	-0.017	0.986	1.220	0.717	1.702	0.089	-0.204	0.057	-3.598	0.000*	1.169	0.606	1.929	0.054
RC	-0.112	0.104	-1.081	0.281	-1.822	0.617	-2.953	0.003*	-0.145	0.087	-1.656	0.098	0.127	0.515	0.246	0.806
InC	-0.136	0.085	-1.600	0.110	0.183	0.051	3.590	0.000*	0.217	0.073	2.959	0.003*	0.126	0.043	2.905	0.004*
PrC	0.094	0.099	0.947	0.344	-0.144	0.062	-2.318	0.021*	-0.321	0.082	-3.929	0.000*	0.147	0.052	2.810	0.005*
FRQ	0.252	0.043	5.872	0.000*	-0.031	0.027	-1.145	0.253	0.115	0.034	3.330	0.001*	0.012	0.022	0.554	0.580
FS	-1.021	0.560	-1.823	0.069	-0.828	0.388	-2.135	0.033*	10.17	0.477	21.30	0.000*	-2.512	0.300	-8.383	0.000*
FL	-0.087	0.251	-0.347	0.729	0.966	0.299	3.231	0.001*	-0.411	0.213	-1.928	0.054*	-0.891	0.243	-3.671	0.000*
FA	-0.063	0.069	-0.910	0.363	0.001	0.001	1.093	0.275	-0.388	0.057	-6.813	0.000*	-0.002	0.001	-2.837	0.005*
R²			0.121718				0.073983				0.585472				0.192509	
Adjusted R²			0.102254				0.058803				0.579046				0.180321	
S.E. of regression			1.101511				0.831984				1.115948				0.727952	

From Table 6, it is manifested that human capital is an insignificant predictor for firm growth rate (β=-0.001, P=0.986), dividend payout ratio (β=1.220, P=0.089) and return on capital employed (β=1.169, P=0.054) but it has negative (β=-0.204) and significant (P=0.000) effect on employee productivity. So, null hypothesis H$_{1a}$ is rejected. Qualified and Skilled labor is reflected as an asset for corporations. But if firms expensed heavily on employees or increase the number of employees and don't use human resource effectively then it can reduce our net profits and ultimately minimize employee productivity. Because it's not enough to have skilled personnel only, they should also be committed and motivated to contributing to their firms (Andreeva & Garanina, 2016). Relational capital has no association with FGR (β=-0.112, P=0.281), employee productivity (β=-0.145, P=0.098) and returns on capital employed (β=0.127, P=0.806) but results showed relational capital has negative association with dividend payout ratio (β=-1.822, P=0.003). So, we null hypothesis H$_{1b}$ is rejected. For receiving high relational capital, an organization raises marketing, distribution and selling expenditures. By growing expenses, profits will be reduced so EPS and DPR will also be minimized. Moreover, there is no relationship between innovation capital and firm growth rate (β=-0.136, P=0.110) nevertheless, innovation capital is positively linked with the dividend payout ratio (β=0.183, P=0.000), employee productivity (β=0.217, P=0.003) and return on capital employed (β=0.126, P=0.004). So, null hypothesis H$_{1c}$ is rejected. R&D activities are necessary to bring innovation in services and products of corporations. Innovation increases operating profit and the net profit of manufacturing firms. Process capital seems to have no significant influence on firm growth rate (β=0.094, P=0.344) and it has a strong negative effect on dividend payout ratio (β=-0.144, P=0.021) and employee productivity (β=-0.321, P=0.000). However, it has positive (β=0.147) and significant (P=0.005) effect on ROCE. So, null hypothesis H$_{1d}$ is rejected. If the firms have best processes, programs and techniques then organization generates high operating profit. if we expensed more in process capital then profit will reduce and eventually DPR will also minimize. In addition to, FRQ has significantly positive impact on FGR (β=0.252, P=0.000) and employee productivity (β=0.115, P=0.001). On the contrary, it has no association with DPR (β=-0.031, P=0.253) and the return on capital employed (β=0.012, P=0.580). So, null hypothesis H$_2$ is rejected. Accuracy, fairness and transparency of figures and facts in financial statements are also the reason for higher financial performance. Firm age, firm leverage and firm size have no significant effect on FGR. Firm size negatively and firm leverage positively influences dividend payout ratio. Firm age has no significant effect on the DPR. Firm size positively and firm leverage and firm age negatively influence employee productivity. Firm age, firm leverage and firm size negatively influence return on capital employed.

Table 7: Moderation Analysis

	Coefficient	Std. Error	t-Statistic	p
Firm Growth Rate				
eVAIC × GFC	-0.001	0.002	-0.437	0.662
FRQ × GFC	0.034	0.283	0.122	0.903
Dividend Payout Ratio				
eVAIC × GFC	2.561	14.17	0.181	0.857
FRQ × GFC	9.122	2291.3	0.004	0.997
Employee productivity				
eVAIC × GFC	53.49	153.3	0.349	0.727
FRQ × GFC	10788.6	24698.8	0.437	0.662
Return on Capital Employed				
eVAIC × GFC	0.887	0.128	6.916	0.000*
FRQ × GFC	-32.54	21.66	-1.503	0.133

Note: GFC = Global Financial Crisis 2007-09, Interaction Term eVAIC = eVAIC × GFC, Interaction Term FRQ = FRQ × GFC, *p < 0.05

Table 7 indicated that Global Financial Crisis positively moderates the relationship of eVAIC on return on capital employed (β=0.887, P=0.000). However, it does not moderate the relationship of eVAIC on firm growth rate (β=-0.001, P=0.662), dividend payout ratio (β=2.561, P=0.857) and employee productivity (β=53.49, P=0.727). So, null hypothesis H$_3$ is rejected. Global Financial Crisis does not moderate the relationship of FRQ on firm growth rate (β=0.034, P=0.903), dividend payout ratio (β=9.122, P=0.997), employee productivity (β=10788.6, P=0.662) and return on capital employed (β=-32.54, P=0.133). So, null hypothesis H$_4$ is accepted.

Conclusion and future direction

This is the empirical study to examine the effect of financial reporting quality, intellectual capital and components of intellectual capital on the financial performance of fortune 500 companies. Elements of intellectual capital are relational capital, human capital, process capital and innovation capital. Results proved that intellectual capital has a significant effect on financial performance. Findings are consistent with previous studies (Khalique *et al.*, 2015; Ferreira & Franco, 2017). Human capital has a significant and negative effect on financial performance. Relational capital has a significant negative effect on financial performance. Finding is consistent with a study of Russia (Andreeva & Garanina, 2016). Process capital and innovation capital has a significant effect on financial

performance. These results enhance prior studies (Naranjo-Valencia *et al.*, 2016; Phusavat *et al.*, 2013; Lee & Lin, 2018). Financial Reporting Quality has a significant positive effect on financial performance. Result enhances prior research (Martinez-Ferrero, 2014; Salehi *et al.*, 2018). Global Financial Crisis 2007-09 positively moderates the effect of intellectual capital on financial performance but it does not the moderate the effect of financial reporting quality on financial performance. Scholar can also consider financial distress as moderating variable. All remaining industries from fortune 500 companies list should be tested for this research model.

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