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MODELLING THE IMPACT OF CORPORATE RISK MANAGEMENT ON FIRMS FINANCIAL PERFORMANCE AND SUSTAINABLE GROWTH: EVIDENCE GROUNDED ON EMERGING AND DEVELOPED COUNTRIES

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ABSTRACT

Growing complexities in the indigence and global business environment the demand of Corporate Risk Management (CRM) has fostered gigantically. Equally, Financial Performance (FP) and Sustainable Growth Rate (SGR) are believed to be the vital parameters for assessing the success of any organization. Both FP and SGR are get affected by different risks. Therefore, to the best of knowledge, this paper is first endeavor meant to empirically shed light on Impact of CRM on firm's (FP) and (SGR). By taking sample of 160 listed non-financial firms from emerging as well as developed Countries stocks markets, on the bases of market capitalization, covering period of 12 years (2007-2018). The CRM index has been constructed by using Principal Component Analysis (PCA) technique. Panel data fixed-effect Model applied on base of Hausman. The results articulated that CRM has significant and positive impact on ROE and SGR in context both cases whereas Inflation has negative relation with both scenarios, but size and Gross Domestic Product (GDP) have positive and significant relationship with ROE and SGR. However, in case of Pakistan, Size and GDP have articulated adverse effect on ROE and SGR.

1. INTRODUCTION

The most conspicuous expression of William Gibs among the corporate world is that "We have no future because our present is too volatile''. We have only risk management'' (Saeidi et al., 2020) Corporate Risk Management (CRM) is most antagonistic and multidimensional conception. (Iswajuni, Manasikana, & Soetedjo, 2018) the value and enormity of effective corporate Risk management cannot be watered down as (ECRM) provides important information to firms one way and enabling them to take effective financial decision other way around. (Fard, Alizadeh, & Ghalmagh, 2014) a good measurement of CR is decisive in evaluating FP and SGR of non-financial sectors like financial. In line with, (Ben Selma, Abdelghani, & Rajhi, 2013) stated in recent era of fast-moving economic landscape, CRM has become a typical standard area of almost all businesses regardless of their size, nature and temperament. Corresponding to these arguments, from the last couple of decades; FRM has experienced explosive development due to volatile economic environment and economic melt- down or turmoil. (Kanani, Moradi, & Valipour, 2013; Singhal, Agarwal, & Mittal, 2011) the understanding of corresponding impact of CRM on non-financial FP is of vital. (Raei & Saeidi, 2010) as in today's fierce competition, the growing complexities in indigence and global business environment have fostered the demand of corporate risk management (CRM) gigantically. According to (Mukherjee & Sen, 2018) (FP) and SGR are believed to be the vital yardsticks for assessing the success of any organization. In contemporary dynamic era of globalization and competitive business environment, CRM is equally important for developed and emerging markets (EM).

Internal as well as external risk factors for firms are dynamic and uncertain. (Aebi, Sabato, & Schmid, 2012) argued that the geographical areas (e.g., emerging and European countries) are gaining momentum predominantly, just because the ever-increasing internationalization inclination in CRM domain. Therefore, there is a sheer need to look into its impact on maximization of wealth through yearly Financial as well as (SGR). (Manab, Kassim, & Hussin, 2010) stated that most of the companies' failures, corporate scandals and frauds are caused by poor risk management. Moreover, (Quon, Zeghal, & Maingot, 2012; Saeidi et al., 2020) advocate that from the last couple of decades, CRM is considered to be one of the sizzling research concerns around the globe especially after financial crunch 2007-2008 and it has attained an unprecedented focus. In continuity with above trail of arguments, (Muriungi, Waithaka, Were, & Muriuki, 2017; Saeidi et al., 2020) CRM theory implies that effective RM benefits encompasses of improved FP, sound-foundation for strategy formulation, better-quality in-service deliverance, more efficient utilization of available resources and to reduce corporate scandals and frauds to the larger extent.

(Muriungi et al., 2017) ERM can produce influential and far far-reaching benefits for almost all organization. CRM theory links to the current study as non-financial firms can achieve superior FP and stable SGR through identifying and managing the business as well as financial risks effectively. Interestingly, (Jafari, Chadegani, & Biglari, 2011) labelled a few studies on peripheral effects and applications of risk management have been done so far and there is no well- thought out and integrated framework. Above and beyond, (Roberts, 2016) stated from the last two decades, firms at global front have been confronting a tremendous pressure to demonstrate high-quality corporate governance more than ever, to manage risk in an appropriate manner. (Mukherjee & Sen, 2018) argued that FP is thought to be the vital yardsticks for assessing the success of any organization. Besides, the next imperative parameter to measure performance is SGR. (Mukherjee & Sen, 2018) Stated that SGR is one of the paramount important gears for analysing company growth and long term or strategic financial planning.

To this addition, the SGR is express as the maximum growth rate (GR) a company can have whereas all of its financial parameters are constant. What is more, according to (Subhani & Osman, 2011) argued that in Pakistan mainstreams of corporations are lagging behind in adopting ERM practices and Pakistan scored is lowest among the rest of the economies of the world who adopt CRM Tools and techniques in the markets. Although, research studies have been carried out on RM and FP in context of CRM, but there is no direct study in perspective of where Pakistan, China, USA and Canada is found in single study after detail literature review (Jafari et al., 2011; Staikouras & Wood, 2004). Besides, previous studies have investigated the impact of CRM on firms FP (Iswajuni et al., 2018; Khan & Ali, 2017; Rahim, 2017; Razek, 2014; Wisdom, Isiaka, & Ogunlowere, 2018) in their research provides a new direction for future researchers and recommend in other financial and non-financial such as mortgage banks, industrial banks. (Roberts, 2016) reported that majority of pervious research work on risk at the firm level and it has been done in context of US firms therefore, it would be interesting to conduct research in another market like UK where a large number of listed companies as compared to rest of the European markets.

He performed analysis in (Crisis period) and his study could not be generalized. In order to strengthen the results present study brings together set of an extended period data by considering stable environment. This is the first study specifically focalizes on modelling the impact of CRM on FP and SGR in case of emerging as well as to developed countries non-financial firms as existing studies are inclusive to get better insights into it by using PCA method CRM index to capture the effect of CRM on FP and SGR. With these episodes in the investment and business world in mind, this study contributes to the CRM literature in several ways. Firstly as (Iswajuni et al., 2018; Kravet & Muslu, 2011; Roberts, 2016) contributed by identifying the impact of CRM on firms FP and SGR by performing Cross Country empirical Analysis. Secondly, findings would be useful insights for management. Last of all, evidence from developed and emerging helps us to better to understand the underlying effect of CSR on FP and SGR. On the foundation of above trajectory of debate, it can be conferred that the CRM is one of the paramount important agendas of emerging research avenues which in turn serve as motivating factor in carrying out this study.

2. LITERATURE REVIEW

2.1 Theoretical settings, empirical Review and Risk Theories

Turning toward specific focus agenda it would have been interesting to begin with historical origin of risk management along with the recent advances in practice. RM has long history. In academic literature ‘’ risk ‘’ is associated with negative outcomes. (Black & Scholes, 1973; Rejda, 2011) stated ‘’ “It is the expression of the likelihood and impact of an event with the potential to affect the achievement of an organization's goals’’. According to (Kithinji, 2010; Tapiero, 2004) corporate risk management entails those practices and procedures that are used to safeguard organization from different risks and to create economic value. (Conti & Mauri, 2008) Likewise, general risk management, corporate FRM needs to recognizing its sources, gauging it and devised a well thought-out plan to address them. Keeping this fact in mind, that a lot of risks categorizations found in the literature pertaining to risk Management. Firstly, risk like financial risk is on the top of the list (Lombardi, Coluccia, Russo, & Solimene, 2016). Plenty of research have been steered on RM in developed nations of the world including UK United Kingdom (Abraham & Cox, 2007), Canada (Lajili & Zéghal, 2005), Italy (Beretta & Bozzolan, 2004) respectively. (Manab et al., 2010) stated that most of the companies’ failures, corporate scandals and frauds are caused by poor risk management. Likewise, (Quon et al., 2012; Sobel & Reding, 2004) the company performance is exceedingly reliant on the effective role of ECRM. Different research scholars have adopted different theories to explicate important of RM around the world. However, our underpinning was on most important theories due to their relevance to present research issues.

The risk management theory (RMT) was developed by (Davis, Schoorman, & Donaldson, 1997) to find out why risk management is required more so by emphasizing on market and credit risk. This theory identifies major sources of value loss of market risk as a change in net value of asset (Wu & Olson, 2010). Risk management is primarily concerned with reducing earnings volatility and avoiding huge losses(Inchausti, 1997; Nandi & Ghosh, 2013; Van Gestel & Baesens, 2009; Wang, O, & Claiborne, 2008). Jafari et al. (2011) conducted a research to find the ERM on firm’s performance and found positive association between total RM and performance by using behavioural as well as practical approach. (Asiri & Hameed, 2014) the study found BR has significant and positive impact on firm value. (Adi, Handayani, & Rahayu, 2013; Data, Alhabsji, Rahayu, & Handayani, 2017) demonstrated that the business risk has negative and statistically significant impact on FP. (Jang & Park, 2011) documented that increase in company growth leads increase in company profitability carried a research on the subject of company growth and firm’s profitability and argued that company growth has significant negative impact on firm’s profitability. To that respect, (Kouser, Bano, Azeem, & Ul Hassan, 2012) stated that company growth has positive and significant impact on firm’s profitability. (Ghalandari, 2013) documented positive association between firm’s value and firm growth. (Alshubiri, 2015) carried out a research in case of Oman industrial sectors and found significant impact of financial and business risk on FP. (Akram, 2014) investigated the impact of liquidity risk on returns in context of Pakistan and found negative implication between the variables.

(Khidmat & Rehman, 2014) probed the effect of liquidity and solvency on the profitability chemical sectors firms in context of Pakistan and found positive liaison. (Fard et al., 2014) studied the effect of risk management on sustainable growth and internal growth rate in perspective of Tehran stock exchange found negative and statistical significant influence by employing regression techniques. (Anderson & Nyborg, 2011) stated Leverage would have negative bearing on FP and SGR. (Stephen A. Ross, 1977) found positive relation between leverage and Growth Ross results are supported by signal impact theory. (Rahim, 2017) probed there is a positive and statistically significant liaison between debt DT, equity total assets turnover and size respectively with SGR. The sample size was 226 companies from all sectors accept financial y covering a period of 2005-2015. The FP and SGR depends on the interrelationship of Risk and Macro-Economic and firms specific indicators. CRM has taken as Independent variable in their studies (Dey, Hossain, & Rezaee, 2018). Business, Operational as well as used by (Kubota & Takehara, 2010). Furthermore, to measure Business risk two measure i.e. Earnings variability (EV) Risk (Alshubiri, 2015; Thomas Sumarsan & Arthur, 2018) and Earnings growth (EG) Risk and Financial Risk studied by (Lombardi et al., 2016). Interest Rate Risk used by (Alshubiri, 2015; Délèze & Korkeamäki, 2018; Mukanzi, Mukanzi, & Maniagi, 2016; Razek, 2014). Liquidity financial Risk Disclosure employed by (Alshubiri, 2015; Mukanzi et al., 2016; Razek, 2014). In the line with strand of literature following are results of major research Studies carried out by (Kravet & Muslu, 2011) captured positive association between FRM and firms performance or profitability by employing Correlation, Regression OLS, logistic regression methods in different countries i.e. UK Malaysia likewise Abraham and (Abraham & Cox, 2007; Iswajuni et al., 2018; Kamal Hassan, 2009; Onoja & Agada, 2015) in context UK Dutch, Nigerian, UK, China, Indonesian buy employing Regression test found mixed results to that respect , (Akram, 2014; Iswajuni et al., 2018) in perspective of Pakistan and Indonesian, 2 phase Regression observed Negative liaison.

(Mukherjee & Sen, 2018) FP are thought to be the vital yardsticks for assessing the success of any organization. (Kanani et al., 2013) stated that firm's growth and risk are paramount important factors in firm's financial information because investment guidance and decision making process are greatly influenced by financials information. (Akhavi, 2015) argued that the company's earning directly affected by different risks. (Jafari et al., 2011) lack of ERM may lead to imposition of unwanted extra costs on investee and investor as well. Poor CRM can lead serious consequences which in turn performance of business can be trickled down. Besides, the next imperative parameter to measure performance is SGR. (Mukherjee & Sen, 2018) SGR is one of the paramount important gears used to analyze a company growth and long term or strategic financial planning. In addition, the SGR is express as the maximum growth rate (GR) a company can have whereas all of its financial parameters are constant. FP is attempted as general measure in order to gauge financial health of a business in monetary term over a specific point in time typically one year (Abor, 2005). Whereas, (SGR) is the rate that a business can use to enhance its income without borrowing money from money lenders or investors is known to be sustainable growth rate SGR (Firer, 1995). Or issue new shares as issuing new securities insert negative signal in the market (S. A. Ross, Westerfield, & Jordan, 2018). High SGR is positive sign and represents that a company is growing (Ross and Jordan 2018). SGR based upon a cash flow models (Higgins, 1977) proposed a (SGR) approach that determines the maximum rate of growth in company sales that would avoid depleting financial resources. He focused on companies during their growth phase when financial needs are most pressing. (Higgins, 1977) assumed that the company sells no new equity, wants to maintain its capital structure, and has a target dividend policy. In this case, retained earnings generate additional equity and the firm borrows sufficient funds to maintain its capital structure.

2.2 Theoretical /Conceptual Framework

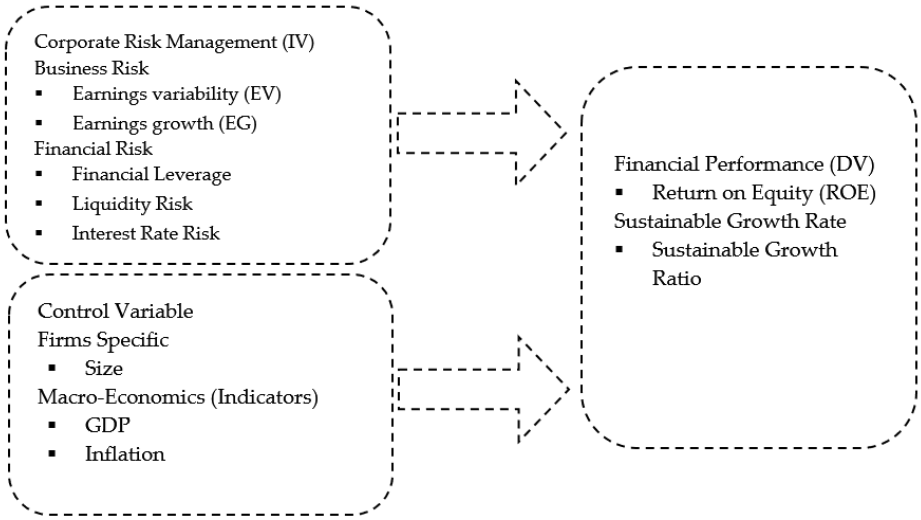

Fig.1. Research Model

In nutshell, a well-thought-out research problem is at the heart of every quality research. The main shortcomings of the earlier studies are found in the research way that these studies have used various types of RM proxy variables in order to gauge the impact of RM on FP. But there is no single measure found to capture the complete effect of RM on FP. Mainstream

of the studies have been conducted on RM and FP but SGR is yet to be explored , (Henkel, 2009), (Andersen, 2008; Fama & French, 1992) respectively. (Roberts, 2016) the notable shortcoming in the most of the previous research models only include single and inappropriate measures of risk. By summing up, it is cleared from the aforementioned facts provided by scholars around the globe that there is a drought in the literature and there is a need of study to fill two gaps by taking non-financial sectors limited focused areas. Simple, this paper investigates the impact of CRM on SGR rate along with FP in non-financial sectors it would be unique endeavor.

2.3 Research Hypothesis

In the light of risk management theory, (Muriungi et al., 2017) stated that the ERM benefits encompasses of improved FP, sound-foundation for strategy formulation, better-quality in service deliverance, more efficient utilization of available resources and to reduce corporate scandals and frauds to the large extent. On the base of above thread of literature, review following hypothesis are derived. The hypotheses are as fellows,

H1: There is a significant impact of (CRM) on firms performance listed on New York Stock Exchange USA.

H2: There is a significant impact of (CRM) on firms SGR firms listed on New York Stock Exchange USA.

H3: There is a significant impact of (CRM) on firms FP listed on Toronto Stock Exchange Canada.

H4: There is a significant impact of (CRM) on firms FP listed on Toronto Stock Exchange Canada.

H5: There is a significant impact of (CRM) on FP listed on Shanghai Stock Exchange (SSE) China.

H6: There is a significant impact of (CRM) on firms SGR listed on Shanghai Stock Exchange (SSE) China.

H7: There is a significant impact of (CRM) on firms SGR on listed on Pakistan stock exchange (PSX).

H8: There is a significant impact of (CRM) on firms SGR on listed on Pakistan stock exchange (PSX).

3. RESEARCH METHODOLOGY

3.1 Research Design, Population, Sampling Technique and Data Collection

The study was structured into two stages. In the first stage, principal components of corporate risk management have been identified on the basis of several financial risk proxies. After that, during second stage different statistical tests were run in order to check the impact and testing hypothesis. A Positivism research philosophy was adopted. (Kothari, 2004) were of the views a positivism research is supported by underlying principle. Targeted Population was consists of non- financial listed firms on SSX (China), NYSE (USA), TSX (Tranto Canada) and PSX grounded on market capitalization. The sample size was 40*4=160 manufacturing firms 40 from each selected stock markets. Twelve years Annual audited financial reports data (2007-2018) was analyzed. Secondary data on Macro-Economic and Firm Specific Indicators (Control Variables), Firm Specific factors (Firm Size), IV main explanatory CRM Index and IV are collected from World Development Indicators (WDI) published by world Bank, Official website of the State Bank of Pakistan (Balance sheet analysis), Open doors for all.com, Annual Reports of the selected non-financial firm listed on TSX, PSX, SSX and NYSX. Moreover, taxonomy used to single out Emerging & Developed Stocks Markets was based on HDI and GDP presented in table 1.

Table 1: Human Development Index (HDI)

Country Name	2018 HDI	2018 World Rank (Status)
China	2018 Rankings 0.752	2018 World Rank Status 86
Canada	2018 Rankings 0.926	2018 World (Rank Status) 12
United State	2018 Rankings .922	2018 World (Rank Status) 14
Pakistan	2018 Rankings 0.562	2018 (World Rank Status) 150

3.2 Measurements of Variables

Table 2: Measurement of Variables

Variables	Notation	Measurement and References
Dependent Variable		
Financial Performance	ROE	ROE =Net Income divided by Shareholders equity
Sustainable Growth Rate	(SGR)	SGR=Retention Ratio minus ROE
Independent Variable		
CRM (IV)	Business Risk	EV=Standard deviation of price earring ratio P/E Ratio=
Index (Constructed PCA-Principal	Earning Variability	MV Per share / (EPS).
Component Analysis)	Earnings Growth	EG Risk=Current Year NP minus Previous Year NP/
	Financial /Leverage/Capital	Previous Year NP
	Structure Risk	FL=Debt /Equity , LR=Current Assets /Current Liabilities
	Liquidity Risk	ICR (Coverage Ratio)=EBIT/Interest Expenses
	Interest Risk	
Control Variable		
Firm Specific	Size	S = Logarithm of Total Assets
Macro-Economic Indicators	GDP	GDP=Annual GDP
	Inflation	Inflation=Annual Inflation Rate

3.3 Statistical Tools and Data Processing

According (Lenka, 2015; Roberts, 2016) PCA is a statistical method attempted to reduce the dimensions by creating a new variable named as PC (Principal components) as linear combination by considering different proxy variables in the multivariate set. Moreover, this is much relevance since none of the out of five CRM proxies can exclusively serve as an adequate proxy for Corporate Risk Management CRM. PCA enabled to take out much of information regarding CRM proxies and simultaneously avoiding the probable multicollinaerity problem of adding more than one indicator in the equation. As PCA technique helps to trim down the number of proxy variables by combining the original variables into smaller set of set of new composite variable. Moreover, in this study the transformation into principal components (practical Significance) is performed very carefully in order to capture the maximum variance on account of first PC from the available data set. Each subsequent component in PCA has the maximum possible variance considering constrain that it is uncorrelated with the earlier components of PCA.

Equation 1: Fj=Wj1X1+ Wj2X2……+ WjpXp

Where; Fj (CRM Index) =Estimate of jth Factor, Wj=Weight on Factor Score Coefficient/ Weight to be determined from the data. Whereas p=Number of variables, Xi or Xp are subset of p Variables under study. The above equitation has been used to perform PCA as used by(Lenka, 2015).

Equation 2: Fj (CRM Index) =Wj_1X_1BR+ Wj_2X_2FR

Equation 3: Fj (CRM Index) =Wj1X1 P/E + Wj1X2EG+ Wj3X3FL + Wj4X4LR + Wj5X5IR

Simply, by employing PCA approach CRM index has been constructed. For this purpose five proxy indicators of CRM were used. PCA enabled to take out much of information regarding CRM proxies and simultaneously avoiding the probable multicollinearity problem of adding more than one indicator in the equation. Before performing regression analysis descriptive analysis was done to portray the statistical behaviours of the collected quantitative data. Hausman test was used to select FE-Mode/ RE-Model. According to (Gujarati, 2009) the decision regarding which model to use fixed/random Hausman test (1978) should be performed by hypothesized that the individual effect is uncorrelated with the explanatory variables. After performing descriptive statistic Hausman test was applied in each case. Diagnostic Tests i.e. Wooldridge Test for autocorrelation test (Gujarati, 2009; Wooldridge, 2002) was applied for first all panels FEM in order to check the serial-correlation. Finally, testing of hypotheses was done with the help of β Coef- and t-Test (*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$) for respective model.

3.4 Econometrics Model (Model Building) and Panel Data Estimation Technique

We used balanced panel dataset for analysis because the same years are used for each selected countries. (Gujarati, 2009) In financial econometrics and basics statistics Panel data also known as longitudinal /pooled data are multidimensional data (Multiple economic Units and over Multiple time periods for the same company/ firm or individual) involving measurements over time. (Park, 2011) it is a composition of cross-section as well as time series data for instance GNP of all Asian countries over 10 years. Panel data are generally analyzed by employing regressions frame work i.e. fixed or random effect model. Panel data regression model is stated as Equation 1 Yit = αi+ βΣXit +εiWhere, i and t denotes sections /country and period respectively whereas Y and X represents variables ε represent error term and α stands for fixed term (Gujarati, 2009; Wooldridge, 2002). Although, the purpose of the research was to utilize the FEM and Random effect Model. In panel data analysis, primarily it should be evaluated whether the difference between fixed effect parameter estimator and random effect estimators are meaningful or not and choosing one method from fixed or random model. Hausman test can be utilized / implemented for selection of the method (Wooldridge, 2002). Similarly, Econometrics Models are as follows;

Equation 4: Yit = αi+ βΣXit +εit, Based on above generalized equation following precise equations were formulated.
Equation 5: "ROEit = αi + β1CRM Index + β2GDPd+ β3IRd+ β4FSit +εit"
Equation 2: "SGRit = αi + β1CRM Index + β2GDPd+ β3IRd+ β4FSit +εit"
Equation 3: "ROEit = αi + β1CRM Index + β2GDPd+ β3IRd+ β4FSit +εit"
Equation 4: "SGRit = αi + β1CRM Index + β2GDPd+ β3IRd+ β4FSit +εit"
Equation 5: "ROEit = αi + β1CRM Index + β2GDPd+ β3IRd+ β4FSit +εit"
Equation 6: "SGRit = αi + β1CRM Index + β2GDPd+ β3IRd+ β4FSit +εit"
Equation 11: "ROEit = αi + β1CRM Index + β2GDPd+ β3IRd+ β4FSit +εit"
Equation 12: "SGRit = αi + β1CRM Index + β2GDPd+ β3IRd+ β4FSit +εit"

Where, The model encapsulates the contribution of IVs and CVs on DVs. CRM was used as IV. CRM has been measured with the help CRM Index Business Risk (DV) (Earnings Variability and Earnings growth Risk Financial /Capital Structure, Leverage and Interest rate and Liquidity risk). Financial Performance (DV) Proxy of FP i.e. ROE= Return on Equity SGR =Sustainable Growth Rate (DV). Firm Specific Control variable, S = Size (Control Variable) as well as Macro-Economic Indicators (Control Variables), IR=Inflation Rate, GDP=Per Capita.

4. EMPIRICAL RESULTS AND DISCUSSION

4.1 Baseline Results-Principal Component Analysis (PCA)

CRM PCA index (Earning Variability, Earning Growth, Leverage/Capital Structure, Liquidity and Interest Risk) is reported below.

Table 3: PCA Index (CRM) for USA Non-Financial firms (2007-2018)

Component	Eigen value	Difference	Proportion	Cumulative
Comp 1 |	1.30477	.190093	0.2610	0.2610
Comp 2 |	1.11467	.084351	0.2229	0.4839
Comp 3 |	1.03032	.214411	0.2061	0.6900
Comp 4 |	.815913	.081593	0.1632	0.8531
Comp 5 |	.73432	.0000	0.1469	1.0000

Referring to table 3 the first Principal component in case of USA firms explains more than 26% of the standardized variance. Thus, the first (PC) in case of USA firms are more relevant measure of CRM. Here, study consider first three Eigen values (26.10%, 22.29 %and 20.61%) cumulative score respectively by basing Kaiser (KMO) Criterion that suggests retain those factors explains standardized variance in the generating PCA index having Eigen values equal or higher than one. USA firm's data is suitable for PCA to construct CRM composite index. In the 3rd column explains difference between one Eigen value or variability in the PCA data and the next and so on, in the last column cumulative scores n+(n-1) are reported.

Table 4: PCA Index (CRM) for Canadian Non-Financial firms (2007-2018)

Component	Eigen value	Difference	Proportion	Cumulative
Comp 1 |	1.18465	.017679	0.2369	0.2369
Comp 2 |	1.16697	.172581	0.2334	0.4703
Comp 3 |	.994388	.1511	0.1989	0.6692
Comp 4 |	.843288	.032581	0.1687	0.8379
Comp 5 |	.810706	.0000	0.1621	1.0000

Apropos to the table 4 the first PC in case of Canadian firms accounts for more than 26% of the standardized variance. Thus, the first (PC) in case of Canadian firms are more relevant measure CRM. Here, study considers first three Eigen values (23.69%, 23.34%and 19.89%) total 66.92% respectively which is sufficient for PCA to construct Composite index.

Table 5: PCA Index (CRM) for Chinese Non-Financial Firms (2007-2018)

Component	Eigen value	Difference	Proportion	Cumulative
Comp 1 |	1.35799	.306252	0.2716	0.2716
Comp 2 |	1.05174	.047193	0.2103	0.4819
Comp 3 |	1.00455	.109585	0.2009	0.6829
Comp 4 |	.894963	.204213	0.1790	0.8618
Comp 5 |	.690751	.000000	0.1382	1.0000

Table 5 illustrate that 1st PC in case of Chinese firms explains more than 26% of the standardized variance. Thus, the first PC in perspective of Chinese firms is more appropriate factor. 1stthree factors having Eigen values one or more than one are booked.

Table 6: PCA Index (CRM) for Pakistani Non-Financial Firms (2007-2018)

Component	Eigen value	Difference	Proportion	Cumulative
Comp 1 |	1.20561	.182965	0.2411	0.2411
Comp 2 |	1.02264	.0480684	0.2045	0.4456
Comp 3 |	.99657	.0109141	0.1973	0.6430
Comp 4 |	.96565	.16614	0.1951	0.8381
Comp 5 |	.809519	.0000	0.1619	1.0000

Table 6 indicates that the 1st PC explains more than 24% of the standardized variance in case of Pakistani firms. Here, study considers first three Eigen values correspondingly retained on the base of Eigen value. Referring to table 6 Pakistani firms' data is suitable for factory analysis.

4.2 Descriptive Statistics

Before performing regression analysis descriptive analysis are done to describe the statistical behaviour of the data to be tested. Table 7,8,9 and 10 presents (mean S.D, Min and Max) i.e. scattering of data and central tendency.

Table 7: Descriptive Statistics (USA)

Variable	Obs	Mean	Std.Dev.	Min	Max
Return on equity	480	.155	.248	-.6250	1.730
Sustainable Growth Rate	480	.358	.804	-7.049	4.666
CRM Index	480	0.01	1.00	-3.908	6.366
Inflation	480	.021	.010	.0010	.0380
GDP	480	.026	.018	-.0260	.0500
Size	480	3.779	.720	2.318	5.446

Table 8: Descriptive Statistics (TSX Canada)

Variable	Obs	Mean	Std.Dev.	Min	Max
Return on equity	480	.158	1.58	-10.877	22.431
Sustainable Growth Rate	480	.423	2.058	-4.133	9.803
CRM Index	348	0.21	1	-.676	8.54
Inflation	480	.016	.005	.000	.025
GDP	480	.017	.016	-.029	.031

Table 9: Descriptive Statistics (SSX China)

Variable	Obs	Mean	Std.Dev.	Min	Max
Return on equity	480	8.759	9.498	-68.98	49.474
Sustainable Growth Rate	480	3.461	4.788	-28.288	54.186
CRM Index	480	.052	1.152	-3.434	5.39
Inflation	480	2.75	1.784	-.7000	5.90
GDP	480	8.617	2.136	6.600	14.2
Size	480	10.488	.695	8.477	13.21

Table 10: Descriptive Statistics (PSX Pakistan)

Variable	Obs	Mean	Std.Dev.	Min	Max
Return on equity	480	13.061	13.942	-33.8	58.77
Sustainable Growth Rate	480	9.28	9.006	-1.71	36.24
CRM Index	480	-.05	.807	-1.029	2.337
Inflation	480	8.303	3.69	2.9	13.70
GDP	480	4.192	.921	2.58	5.54
Size	480	5.459	1.551	2.786	9.50

In the first column, the mean vales of ROE, SGR, CRM and inflation, GDP and size with standard deviation in the second column, and the minimum as well as maximum values respectively in the last column. The average value of ROA is .155 or 15.5% while maximum and minimum values are -.625 and 1.73 respectively.

4.3 Robustness Tests (ROE)

According to (Gujarati, 2009) the decision apropos to which model use fixed/random Hausman test (1978) should be performed by hypothesized that the individual effect is uncorrelated with the explanatory variables. If the P-value engendered from Hausman test is lower than (0.05) /p<0.05 the null hypothesis should be rejected and FEM should be used and if the (p>0.05) alternative hypothesis should be accepted and random effect should be employed. Referring to Husman test given in table 11 null hypothesis is rejected and decide that the FEE is efficient in case of emerging and developed countries for ROE,s all models.

Table 11: Hausman Test [2007-2010] (Emerging and Developed Countries)

Model ROE	USA- A1	Canada- B1	China-V	Pakistan- D1
Hausman Test	Chi2(30) = 12.79	Chi2(30) = 18.34	Chi2(30) = 19.05	Chi2(30) = 11.23
	Prob>Chi2 = 0.00	Prob>Chi2 = 0.010	Prob>Chi2 = 0.020	Prob>Chi2 = 0.003

4.4 Fixed Effect Regression Model (ROE)

Table 12 FEMs i.e. (A1, B1, C1, and D1) to dissect balanced panel data were stated together. Referring to table 12 indicates FEM A1 in case of USA firm's β coefficient value of CRM Index is (0.081) that validates CRM index has positive impact on ROE which is practically significant. Similarly, coefficient values of inflation is (-.076) which is in negative direction that indicating inflation has adverse effects on ROE. It means that (1) % increase /decrease in the inflation in case of USA results (-.076) % decrease in ROE while other thing remaining the same. Besides, GDP and Size (0.050 and 0.025) correspondingly capture positive and statistically significant impact on ROE. Simply, the empirical findings indicated that CRM index and Control variables are statistically logical behaviour with ROE in case of USA for the period of 2007-2018. The F

statics test value designates the model (A1, B1, C1, and D1) are significant. The regression results indicate that the R-Square value is (55.2) % which implies that panel data FEM A1 R-Square explained (53.0) % systematic variations. The error term in the FEM is 44.8 % which is unresolved /unexplained variation or explained by other variables outside the model used. The t and P value represents that whether the values in the model is statistically significant (logical) or not. The study results are in coherent with (Alshubiri, 2015; Asiri & Hameed, 2014; Ghalandari, 2013; Jafari et al., 2011; Rahim, 2017; Roberts, 2016) respectively. FEM B1 β value of CRM Index is (0.024) that outlines significant impact. On the contrary, β values of inflation (-0.040) has negative trend that indicating inflation has adverse effects on ROE. In addition, GDP and Size (0.047 and 0.076) in turn captured positive and statistically significant impact on ROE.

The R-Square value is (49.1) % which infers that panel data FEM B R-Square explained (47.1) % systematic variations. Results are in line with (Alshubiri, 2015; Jafari et al., 2011; Rahim, 2017). FEM Panel C1βvalue of CRM Index is (.070) which establishes significant effect on ROE. Dissimilarly, β value of inflation is (-.017) which is in negative inclination that means inflation has adverse effects on ROE. In addition, GDP and Size (0.036 and 0.035) correspondingly capture positive and statistically significant impact on ROE. Results are in conformity with (Alshubiri, 2015; Jafari et al., 2011; Rahim, 2017). Referring to, Panel D1 FEM β value of CRM Index is (0.043) CRM index positive significant impact on ROE. On the contrary, β values of inflation, GDP and Size (-.047, -039 and -.057) correspondingly are in negative direction that indicating inflation, GDP and size have adverse effects on ROE.

Table 12: Estimation Results Regression Fixed Effect

Country	FE-Model	USA	Canada	China	Pakistan
		Panel (A1)	Panel (B1)	Panel (C1)	Panel (D1)
Variables		ROE	ROE	ROE	ROE
CRM Index	Coef.	0.081***	0.024**	.070***	.043**
	Std.Err.	0.001	0.013	0.041	0.050
		(3.390)	(4.260)	(4.930)	(2.370)
Inflation	Coef.	-.076***	-.040**	-0.017***	-0.047***
	Std.Err.	0.070	0.056	0.031	0.060
		(2.030)	(1.990)	(2.940)	(3.130)
GDP	Coef.	.050**	0.047**	0.036***	-0.039**
	Std.Err.	0.010	0.010	0.034	0.510
		(4.060)	(2.08)	(3.800)	(2.9)
Size	Coef.	0.025***	0.076**	0.035***	-0.057**
	Std.Err.	0s.410	0.121	0.036	(0.230)
		(2.200)	(3.98)	(4.400)	(2.260)
Constant	Coef.	.075***	.0792**	.067**	.099***
	Std.Err.	0.130	0.341	0.452	0.510
		(3.370)	(3.230)	(4.340)	(15.55)
Observations		480.000	480.000	480.000	480.000
Number of firm's_id		40.000	40.000	40.000	40.000
R-squared		0.552	0.491	0.445	0.381
r2_a		0.530	0.471	0.423	0.342
F –statistic		17.910	20.326	38.610	11.870
P		0.000	0.002	0.000	0.000
t-statistics in parentheses					
*** p<0.01, ** p<0.05, * p<0.1					

Source: Results output from Stata, DV Return on Equity (ROE)

The regression results indicate that the R-Square value is (38.1) % which implies that panel data FEM. The study results are similar to (Alshubiri, 2015; Jafari et al., 2011; Rahim, 2017).

4.5 4Robustness Tests (SGR)

Table 13: Wooldridge test for autocorrelation (Panel Data)

Wooldridge test for autocorrelation (Panel data)			
DV = ROE	DV = ROE	DV = ROE	DV = ROE
H0: No first-order autocorrelation			
USA -A1	Canada -B1	China- C1	Pakistan -D1
F(1, 30) = 3.531	F(1, 30) = 9.809	F(1, 30) = 1.057	F(1, 30) = .169
Prob > F = 0.1703	Prob >F = 0.3121	Prob > F = 0.3104	Prob > F = 0.2886

The Wooldridge Test for autocorrelation test applied for first four panels FEM A1, B1 C1 and D1.

Table 14: Hausman Test [2007-2010] (Emerging and Developed Countries)

Model SGRs	USA- A2	Canada- B2	China- C2	Pakistan- D2
Hausman Test	Chi2(30) =11.230	Chi2(30) =14.330	Chi2(30) =14.110	Chi2(30) =12.010
	Prob>Chi2=0.00	Prob>Chi2=0.00	Prob>Chi2=0.00	Prob>Chi2=0.00

The results in the table 13 No serial correlation found in the data and we are fail to reject the Null hypothesis and conclude that that data does not have first order autocorrelation in case of emerging as well as developed countries. Hausman test results presented in table 14 fixed effect model was found suitable for SGR for Emerging and Developed Countries Non-Financial Firms for the period of 2007-2018.

4.6 Fixed Effect Regression Model Results (SGR)

Table 15 reports the results of Four Panel FEMs (A2, B2, C2 and D2).

Table 15: Estimation Results Regression Fixed Effect Model

Country	FE-Model	USA	Canada	China	Pakistan
		Panel (A2)	Panel (B2)	Panel (C2)	Panel (D2)
Variables		SGR	SGR	SGR	SGR
CRM Index	Coef.	0.079***	0.093***	.055***	0.027**
	Std.Err.	0.002	0.211	0.041	0.015
		(8.620)	(7.720)	(8.310)	(1.990)
Inflation	Coef.	-.083***	-.091***	-.096***	-.090**
	Std.Err.	0.403	0.053	0.431	0.314
			(3.18)	(5.95)	(4.55)
GDP	Coef.	-.040***	-.055**	-.016**	-.062**
	Std.Err.	0.002	0.052	0.084	0.290
		(6.060)	(9.509)	(7.930)	(4.416)
Size	Coef.	-.023***	-.056***	-.065**	-0.054**
	Std.Err.	0.041	0.101	0.036	0.203
		(8.06)	(7.59)	(7.930)	(5.406)
Constant	Coef.	0.439***	8.858***	13.315***	2.858***
	Std.Err.	0.013	0.335	0.351	0.502
		(2.290)	(2.850)	(3.47)	(3.450)
Observations		480.000	480.000	480.000	480.000
Number of firm's_id		40.000	40.000	40.000	40.000
R-squared		0.491	0.512	0.531	0.321
r2_a		0.472	0.491	0.509	0.301
F –statistic		18.310	16.327	22.602	12.021
P		0.000	0.000	0.000	0.000
t-statistics in parentheses					
*** p<0.01, ** p<0.05, * p<0.1					

Source: Results output from Stata, DV Sustainable Growth Rate (SGR)

Table 15 β value of CRM Index is (0.079) which means CRM has positive and significant impact on SGR. Incompatibly, β values of all controls variables, with negative signal means unfavourable effects on SGR. The F statics test value indicates the model is significant. The R-Square value is (49.1) %. Table 4.12 CRM β value is (0.093) % that exhibits CRM index has positive and significant association with SGR. Unalike, β values all CVs are (-.091, -.055 and -.056) which is negative indication means all CVs have inauspicious bearing on SGR. The F statics test value indicates the model A2, B2, C2 and D2 are significant. The regression results indicate that the R-Square value is (49.1) %. The β coefficient Value panel B We accept 4th Hypothesis i.e. which is in consonant with (Ahmad et al. 2017). Table 15 CRM β value is (0.055) that demonstrates CRM index insert positive and significant bearing on SGR. Quite the reverse, β values of all CVs are (-.096, -.016 and -.065) which is negative indication means all CV's have inauspicious bearing on SGR. The R-Square value is (53.1) % which implies that panel data FEM C2 R-Square explained (53.1) % systematic variations. The β value CRM is (0.027) means CRM index has positive and significant impact on SGR. In contrast β values of all CVs are (-.090, -.064 and -.054) % which are in negative drift means All CVs have unfavourable belongings with SGR. Referring to table 4.14 no serial correlation found in the FEM data and we are not be up to snuff to reject the Null hypothesis and conclude that that data does not have first order autocorrelation in case of emerging as well as developed countries.

Table 16: Wooldridge test

Wooldridge test for autocorrelation (Panel data)			
H0: no first-order autocorrelation			
DV = SGR	DV = SGR	DV = SGR	DV = SGR
USA- A2	Canada- B2	China- C2	Pakistan- D2
F(1, 30) = 3 .531	F(1, 30) = 10.809	F(1, 30) = 1.057	F(1, 30) = 1.169
Prob > F = 0.3113	Prob > F = 0.1186	Prob > F= 0.1424	Prob > F = 0.6737

Steered by the rising curiosity of CRM in non-financial sector like financial sector, the findings signify CRM has a significant and positive influence on FP and SGR and contribute to literature by adding new and most recent evidence from emerging and developed countries non-financial markets.

Table 17: Summarized Hypothesis Testing

Country	Hypothesis	β	t-estimation	P(Sig.)	Status
US	H1 CRM &FP	0.081***	3.39	✓	Accepted
	H2 CRM & SGR	0.079***	8.62	✓	Accepted
Canada	H3 CRM &FP	0.024**	4.26	✓	Accepted
	H4 CRM & SGR	0.093***	7.72	✓	Accepted
China	H5 CRM &FP	.070***	4.93	✓	Accepted
	H6 CRM & SGR	.055***	8.31	✓	Accepted
Pakistan	H7 CRM &FP	.043**	2.37	✓	Accepted
	H8 CRM & SGR	0.027**	1.99	✓	Accepted

Table 18: Modified Wald Test for GroupWise Heteroscedasticity (R0E)

Modified Wald Test For GroupWise Heteroscedasticity			
DV = ROE	DV = ROE	DV = ROE	DV = ROE
H0: sigma(i)^2 = sigma^2 for all i			
USA	Canada	China	Pakistan
Prob>chi2 = 0.1351	Prob>chi2 = 0.1601	Prob>chi2 = 0.1910	Prob>chi2 = 0.1760

Table 9: Modified Wald Test for GroupWise Heteroscedasticity (SGR)

Modified Wald Test For GroupWise Heteroscedasticity			
DV = SGR	DV = SGR	DV = SGR	DV = SGR
H0: sigma(i)^2 = sigma^2 for all			
USA	Canada	China	Pakistan
Prob>chi2 = 0.1020	Prob>chi2 = 0.1090	Prob>chi2 = 0.1067	Prob>chi2 = 0.1410

5. CONCLUSION, RECOMMENDATIONS AND FUTURE DIRECTIONS

This paper was meant to empirically shed light on Impact of CRM on firm's (FP) and (SGR). By taking sample of 160 listed Non-Financial firms from emerging as well as developed Countries, covering period of 12 years (2007-2018). The CRM index was constructed by using (PCA) technique, besides, based on Hausman Tests Panel data fixed-effect Model was applied. The results revealed that CRM has significant and positive impact on ROE and SGR in context both cases whereas Inflation has negative relation with both scenarios but size and GDP have positive and significant relationship with ROE and SGR. However, in case of Pakistan, Size and GDP have articulated adverse effect on ROE and SGR. The results are in consistent with literature. CRM theory links to the current study as non-financial firms can achieve superior FP and SGR through identifying and managing the impact of CRM (Business as well as financial risk on SGR and FP. The study established that the CRM is important for attaining SGR and enhancing FP of emerging and developed countries non-financial markets. Based on study results it is argued that emerging ad developed countries no-financial firms should pay special attention on different kinds of risk as in this it has been validated that risk management has significant bearing on firms long term as well as short term performance.

However, this study contributes in the thread of existing literature by articulating the impact of CRM on FP and SGR in case of non-financial sectors of both emerging and developed countries. The study offers implications and significance for multifarious demeanour especially who operates in indigence as well as international settings. Firstly, it is recommended that the risk factors should be considered in decision making because Risk management has significant impact on firms FP and SGR). Secondly, employees should be trained to identify the business, financial risk and they need to develop the strategies to handle such kind risks in order to perk up the FP and growth rate for long run survival. This paper recommends that management of both the emerging as well as developed markets should implement quality risk management system in order to manage different risks effectively. This paper was confined to investigate the impact of some of the risks factors on SGR and FP. Besides this, in future the issue should be tested by considering wider aspects and more risk factors such as cybercrime, corporate governance, operational, political, foreign exchange, and supply chain during Covid 19, value at risk and other risk to construct robust CRM Index, in other Emerging and growth leading and developed economies for getting more excited empirical findings. Finally, mixed methodology should be incorporated because the measurement of some kinds of risks are staggering and cannot be quantified to shed novel findings on this sizzling research concern.

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