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COMPETITION AND RISK TAKING BEHAVIOR OF BANKS: NEW EVIDENCE FROM MARKET POWER AND CAPITAL REQUIREMENTS

Abdur Rahman Aleemi, Dr. Imam Uddin and Dr. Muhammad Kashif

Abstract

The relationship between competition and banking stability has resulted in two opposing paradigms; competition-fragility view suggests that increased competition erodes market power and encourages banks to take excessive risks. In contrast, the competition-stability view suggests that, low competition results in more market power which may encourage the banks to charge higher loan rates adversely affecting borrowers by risk shifting mechanisms. Given these opposing predictions in the literature, this study aims to test the two views, considering the effects of market power and capital requirements on the riskiness of Pakistani banks. Utilizing annual data for 30 banks over the period of 2004 to 2017, in a dynamic two step system GMM. We construct Lerner index as a direct measure of market power for the banking industry. Our findings support the competition stability paradigm in the case of Pakistan. We also find that the theoretical link between capitalization ratio and market power is sufficiently strong and should be encouraged as greater capital buffers reduce risk exposure.

Keywords: Banking Stability, Capital Adequacy, Competition, Lerner Index, Market Power.

JEL Classification: G210, G320

Introduction

Given the context of banks’ safety and soundness, the relationship between competition and stability has long been debated. Several studies have shed light on the said nexus, however the evidence is largely contentious and inconclusive. There are two predominant and contrasting hypotheses which view the relationship between competition and stability in different ways (Berger et al., 2009; Cihák et al., 2006). One is the competition-stability and the other is competition-fragility view.
The competition-stability view mainly draws from Boyd and De Nicolo (2005), who suggested a tradeoff between risk and incentive mechanisms of banks. Less competitive markets, allow banks to exercise market power enabling them to charge higher rates and earn more as their markets become concentrated, which in turn may become difficult for the borrowers to pay off. Thus making it riskier. To supplement higher rates, borrowers tend to undertake risky projects, resulting in increased defaults. More borrowers’ defaults affect banks’ solvency through risk shifting mechanisms (Stiglitz & Weiss, 1981) and adds on to the fragility of the entire financial system.

In contrast, the competition-fragility view, advocates that due to higher level of competition banks’ margins and market power are eaten away, which in turn induce the banks to take on risky projects thus adding into fragility (Keeley, 1990; Marcus, 1984; Matutes & Vives, 2000). Following the seminal work of Keeley (1990), several studies indicate that higher competition results in enhanced moral hazard in banking system and thus it is suggested that less competitive and relatively more concentrated banking conditions are expected to be relatively stable (Martinez-Miera & Repullo, 2010; Jiménez et al., 2013).

In short, the literature largely provides mixed evidence that whether competition and stability are positively or negatively linked. However, it’s worth noting that, the said relationship is largely investigated for advanced economies, and very little attention has been paid towards developing and emerging economies. Kasman and Kasman (2015) argues that financial liberalization, deregulation and large scale restructuring across markets have changed the competitive landscape in banking, both in developed and developing economies; forcing the banks to operate on low profit margins and eroding market power. Similarly, Sarkar and Sensarma (2016) argues that since, emerging economies are rapidly undergoing drastic structural changes, it has become extremely challenging for the policy makers to maintain stability. Hence it is imperative to understand the wide ramifications of competition-stability and or fragility nexus as any such aggravation can pose systemic risk.

To fill that gap, our study contributes in several ways. First, we investigate the competitive conditions for banks in Pakistan. Second, we apply a structural neo-organizational approach for the first time in a country specific settings by estimating Lerner Index as a direct measure of market power by following Berger et al. (2009) and Forssbaeck and Shehzad (2015).

The construction of the Lerner index for Pakistani banks in itself is a contribution as to the best of our knowledge, to date, no such attempt has been made except that of World Bank (2011). The only closely relevant study is that of Mirza et al. (2016) who measures the degree of competition for Pakistani banking sector with Hall-Roeger indicator, Panzer-Rosse’s H-statistics, the Boone’s indictor and Bresnahan-Lau procedure over 2004 to 2012. Similarly, Khan and Riazuddin (2009) assessed the degree of competition for the banking industry of Pakistan using only the Panzer-Rosse H-Statistic. Similarly, another effort by Afzal and Mirza (2010) measures market power in terms of banks’ market
share. However, they still fall short to construct Lerner index as a direct measure of market power. In short this is a major gap and is intended to be traversed in the current study. Third, we use two different sets stability measures to have a comprehensive understanding of competition stability and or fragility nexus for Pakistani banks. Fourth, we introduce the capital adequacy as a policy framework in the competition-risk framework for Pakistani banks.

**Literature Review**

The extant literature on competition stability and or competition fragility is comprised of both theoretical and empirical studies and by large produces inconclusive and contrasting evidence.

*Competition Fragility Hypothesis:* A broader interest in the competition-stability and or fragility nexus has been introduced by the seminal work of (Keeley, 1990), who was the first to address the issue both theoretically and empirically under the auspices of the *charter value hypothesis*, which posits that greater competition erodes market power by reducing charter value which in turn may induce banks to take excessive risks, exacerbating moral hazard and adverse selection and resultantly increases the probability of banks’ failures. However, if banks have certain degree of market power and hence positive charter value, they may not have higher incentives for excessive risks. Hence bankers will be more prudent in this way (Beck, 2008; Kasman & Kasman, 2015). Similarly, Edwards and Mishkin (1995) links excessive risk taking by US banks during 1980s to the erosion of their profit margins due to high competition which suppressed their cost advantage in acquiring deposits with undermined position in loan markets (Carletti & Hartmann, 2002). Moreover, Boot and Greenbaum (1995) argues that highly competitive banking markets restricts banks’ informational rents resulting from their relationships with borrowers. This bank-depositors’ relationship framework has been extensively explored by (Besanko & Thakor, 1995) and show that increased competition leads to the selection of riskier portfolios. The same idea has also been echoed by (Allen & Gale, 2000, 2004), who supports the charter value hypothesis by adopting an agent based model and concludes that less concentrated banking systems are more likely vulnerable to financial crises.

Similarly, Beck (2008) sheds light on the positive link between market power and stability that in highly competitive markets, banks face greater pressure to maintain their profits as compared to systems where entry is restricted with relatively low competition resulting in better profit opportunities. Thus making risk taking relatively unattractive since banks have fewer incentives to gain, therefore affecting financial stability positively. In this way, to preserve financial system’s stability, higher competition has to be restrained. Arguably, the theoretical literature in this realm has been supported by other numerous theoretical studies including (Caminal & Matutes, 2002; Carletti et al., 2007) among others.

*Competition Stability Hypothesis:* Despite the fact that the charter value hypothesis has got significant support, yet existing theoretical studies by and large produce mixed results. Boyd and De
Nicolo (2005) were among the first to question the competition fragility hypothesis and proposed the competition stability hypothesis. They argue in favor of a positive relationship between competition and stability and take that low competition in banking provides opportunities for banks to exercise market power and to charge higher loan rates. These higher loan rates may increase default probability by inducing borrowers to assume higher risks due to moral hazard and adverse selection issues, leading to a more fragile banking system.

However, Boyd et al. (2009) does not confirm their previous findings by assuming that banks also hold a risk free asset. Moreover, they further suggest that borrowers’ default is highly correlated with bank failure. Similarly, (Martinez-Miera & Repullo, 2010) argue that since competition negatively affects interest income thus higher correlation between borrowers’ default and bank failure may not necessarily be true. More recently, Arping (2014) presents a puzzling condition by setting a model where banks are shown as relatively more reluctant towards excessive risk in competitive conditions. They show that during greater competition, banks face high risk of failures as their profit margins decline. In such conditions banks tend to reduce their risk taking yet at the same time their risk profile worsens as a result of the direct destabilizing effects of reduced margins. This situation further erodes their capital buffers which leads to contrary implications that the competition effects on risk taking and on risk of failure may move in opposite directions. They conclude that heightened market power spur more aggressive risk taking by increasing the banks’ risk appetite. Making the effect of market power, thus more ambiguous and puzzling.

In the context of developing economies, (Ariss, 2010) models to examine how different degrees of market power affect banks’ efficiency and stability and reports that greater degree of market power not only enhances banks’ stability but also enhances profit efficiency. Similarly, (Yaldiz & Bazzana, 2010) provides support in favor of competition stability for the Turkish banking system by investigating the role of market power on loan risk and overall bank risk. However, another recent evidence for Turkish economy comes from (Kasman & Kasman, 2015) who took into account the effects of concentration and competition on financial stability using the Boone indicator and an efficiency adjusted Lerner index for market power while proxying Z-index and NPL as stability measures. They also allow for non linearities and produce evidence in favor of competition fragility.

Though emerging economies have had very little attention in the literature, however, still a number of contributions are documented. For instance, (Soedarmono et al., 2013) accounts for the effects of Asian crisis for emerging economies in Asia and finds association between holding higher levels of capital and greater degree of market power and higher insolvency ratios. They further suggest that during the crisis periods, market power had stabilizing effects on Asian banks. A similar context was also reported by (Soedarmono et al., 2011) taking into consideration the question of moral hazard for Asian banks. However, they find that greater market power is associated with greater instability albeit the fact that banks are relatively better capitalized in less competitive conditions yet their default risk is higher. More recently, Apergis (2015) takes the effects of the recent global finan-
cial crisis for a panel of emerging economies by utilizing the (Panzar & Rosse, 1987) H-Statistic, and provide support for monopolistic competition. Moreover, Zhang et al., (2013) examines the relationship between concentration, stability and performance for BRICS countries.

For the Indian banks, recently Sarkar and Sensarma (2016) tests the validity of the charter value paradigm and the Boyd & De-Nicolo framework and found that the relationship is relatively more subtle than straightforward. On the one hand they report concentration positively affecting, default, and asset and market risk but on the other, concentration is also positively affecting capital buffers, suggesting that increased competition may deteriorate capital buffers as safety cushion for Indian banks.

From the perspective of Pakistan, the only closely relevant study is that of (Mirza et al., 2016) who investigated the competitive condition for the banking industry of Pakistan with a variety of structural and non-structural measures like the (Panzar & Rosse), (Bresnan & Lau), (Hall & Roege) and the Boone’s indicator. They suggest that Pakistani banking industry is quiet competitive. However, they only account for the prevailing competitive conditions in Pakistani banking industry and do not take into account the risk taking behavior and or stability/fragility notion in the case of Pakistan.

Though in the light of the most of the literature, it is still hard to draw any strong and conclusive deduction. In summary, both the theoretical and empirical literature appears to be divided into two distinct paradigms. One can easily narrow down these dimensions to one that covers the negative relationship under the auspices of charter value paradigm with high competition and low market power. Whereas the other, that comes with the notion that less competition and more market power may undermine stability under the risk shifting paradigm. A possible reason for such extensive heterogeneity in the literature is that the market power-stability-fragility nexus is extremely complex and highly case dependent. Which warrants further investigations to bring into light the opaquer issues in conjunction to market structure and financial stability. There is apparently no clear consensus and neither any compelling theoretical nor any robust empirical evidence to conclude that whether competition leads to fragility or promotes stability.

Tools and Methods

Dependent Variables: Risk Measures

Liquidity Risk: As per the Theory of Financial Intermediation, banks are considered as financial intermediaries, pooling deposits and lending these to create loans (Werner, 2016). Under this theory, banks are also responsible for the creation of liquidity. In the words of (Dewatripont et al., 2010), liquidity is created (by banks) by borrowing short and lending long. This mismatch of maturity timings sometimes creates a potential problem of liquidity risk, which arises when a firm is unable to
meet its liabilities upon becoming due. Furthermore with the implementation of Basel III accord, liquidity risk in particular has received much interest, due to its importance during periods of crises alluded to the fact that banking activity is largely characterized by this key risk (Tanda, 2015). Given this, we adopt the ratio of liquid assets to total assets, where higher ratio indicates lower liquidity risk and vice versa (Bourkhis & Nabi, 2011; Demirgüç-Kunt & Huizinga, 2004; Hussein, 2010; Sarkar & Sensarma, 2016).

\[ \text{Liquidity Risk} = \frac{\text{Liquid Assets}}{\text{Total Assets}} \]  

**Default Risk:** Also known as solvency risk, is widely captured in the banking literature by Z-Scores. Unlike liquidity risk, Z-Score indicates the overall bank risk (Abedifar et al., 2013; Bakkar et al., 2016; Cabrera, 2016; Čihák & Hesse, 2010; Kasman & Kasman, 2015). Z-scores are calculated taking accounting based asset returns and equity’s volatility as given below;

\[ Z_{it} = \frac{\text{ROA}_{it} + \left( \frac{E}{TA} \right)_{it}}{\sigma \text{ROA}_{it}} \]  

Where \( \text{ROA} \) is the accounting measure of return on assets and \( E/TA \) is the equity ratio for bank \( i \) at time \( t \). Whereas \( \sigma (\text{ROA}) \) is the standard deviation of \( \text{ROA} \). The scores combine profitability, leverage and volatility in returns given by its \( \text{ROA}, E/TA \) and \( \sigma (\text{ROA}) \) respectively and indicates the distance in terms of the number of standard deviation of return on assets a bank is far from solvency and the likelihood of failure (Boyd & Runkle, 1993; De-Nicolò, & Jalal, 2006). A higher Z-score suggests greater stability and lower probability of insolvency and vice versa.

**Explanatory Variables**

**Measuring Market Power:** Market power is a reflection of a firm’s ability to set prices above its marginal cost (Williams, 2012). A common practice to measure market power in the banking industry is the Lerner index which is been extensively used in the banking literature and indicates the relative price difference between marginal cost scaled by the price of a firm’s output and is therefore inversely related to competition (Forrsbaec & Shehzad, 2015). The Lerner index has got several advantages over its peers such as the Panzer and Rosse H-Statistic and the Boone indictor that it measures market power at the bank year level. Furthermore, (Iveta, 2012; Rojas, 2011) indicates that Lerner index illustrates the behavioral departure point for imperfectly competitive markets from the benchmark of perfect competition. The index ranges from 0 to 1, with 0 means perfect competition and 1 indicating monopoly representing the conjectural variations of elasticity of the total banking output in terms of the output by Bank \( i \) (Soedarmono & Tarazi, 2014). It is expressed as inverse of the

\[ \text{Lerner} = \frac{\text{Price} - \text{Marginal Cost}}{\text{Price}} \]
price elasticity such as;

\[ Lener = \frac{(P_{it} - MC_{it})}{P_{it}} \] ..........................(3)

Where \( P_{it} \) indicates output prices, proxied by the ratio of total earning assets to total assets and \( MC_{it} \) are marginal costs for bank \( i \) at time \( t \) respectively. The marginal costs is derived from a translog cost function using a system of equations with respect to one output (the ratio of earning assets over total assets) and three inputs (prices for capital, funding and labor) by following (Degl’Innocenti et al., 2017; Demirgüç-Kunt & Martinez Pería, 2010; Forssbaeck & Shehzad, 2015; Williams, 2012) as;

\[ \ln(TC) = \alpha + \sum_{k=1}^{3} \beta_k \ln(Y_{kit}) + \sum_{h=1}^{3} \beta_h \ln(W_{hit}) \]
\[ + \sum_{h=1}^{3} \sum_{m=1}^{3} \frac{1}{2} \gamma_{hm} \ln(W_{hit}) \ln(W_{mit}) + \sum_{k=1}^{1} \delta_k \] ..........................(4)

The above specification indicates total cost (\( TC \)) as a function one output (\( Y_k \)) with three inputs of capital, labor and funding presented by \((W_h)\), a time trend \((T)\) representing technological and technical change. A set of bank level specific control variables are presented by the vector \((X_p)\) which in our case is equity. We follow the stochastic frontier approach and estimate the above system as constrained linear regression with restrictions of linearity and homogeneity (Degl’Innocenti et al., 2017; Koetter, Kolari, & Spierdijk, 2012). Finally, to construct the Lerner index, the marginal costs are then derived by differentiating as given by;

\[ MC_{Lit} = \frac{\partial TC_{it}}{\partial \ln Y_t} = \left[ \beta_L + \beta_{I1} \ln Y_t \right] \frac{TC_{it}}{Y_t} \] ..........................(5)

**Capital Adequacy Ratio**

Capital adequacy ratio is a measure of banks’ capital buffer against contingent losses (Afzal, 2015). Banks having higher capital buffer are considered less risky as higher capitalization provides with a safety cushion and makes the banks less vulnerable to negative shocks. We consider capital adequacy ratio as a measure of regulatory framework, as every bank is required to maintain a healthy CAR (minimum 11.3% as of December 2017 in the case of Pakistan) as per regulatory mandatory minimum capital requirements under the auspices of Basel Committee for Banking Supervision.
(BCBS) and Basel accords. The association between risk taking and capitalization ratio is well documented in literature (for instance see (Haq et al., 2016;) and (Tanda, 2015) for a comprehensive review). Moreover, we consider banks’ CAR for its potential effects on bank lending behavior and as a potential indicator of capital crunch issues (Soedarmono & Tarazi, 2014). Following the BCBS guidelines we estimate CAR as follows;

\[
CAR_{it} = \frac{\ln(CapitalBase)_{it}}{\ln(RWA)_{it}} \tag{6}
\]

Whereas the capital base indicates the sum of Tier-I and Tier-II capital while RWA indicates risk weighted assets.

**Control Variables:** To control for different bank specific characteristics, we include natural log of total assets to control for size and possible heterogeneity arising from economies of scale. Similarly, heterogeneity arising from profitability is controlled for by return on assets (ROA). Whereas a macroeconomic control variable in the form of real GDP growth rate is also included to control for business cycle variations. As we believe that risk related measures of banks are pro-cyclical, thus a macroeconomic control variable is necessary and important. 2.3

**Empirical Research Design and Econometric Specifications**

In order to test the relationship between market power, riskiness of Pakistani banks and capital requirements, we set up a general model to specify the relationship as follows;

\[
Risk_{it} = \alpha_{it} + \beta_1 MP_{it} + \beta_2 CAR_{it} + \sum_{i=1}^{k} \beta_{3+i}(BankSpecificControl)_{kit}
+ \sum_{j=1}^{m} \beta_{3+m}(Macro - LevelControl)_{mit} + \epsilon_{it}, \tag{7}
\]

Where, MP presents the measures for market power, i.e. the Lerner index, CAR indicates the capitalization ratio. Bank specific control include, bank size and ROA whereas macroeconomic control include business cycle proxied by real GDP growth rate as in (Kasman & Kasman, 2015). Finally, risk indicates distress indicators for liquidity and default risk. Whereas the \( \epsilon_{it} \) is the stochastic disturbance term that is believed to be white noise and is expressed under the assumptions as;

\[
\epsilon_{it} \sim IID(0, \sigma^2) \tag{8}
\]

Equation (10) summarizes that \( \epsilon_{it} \) should be independently and identically distributed.
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*Estimation Methodology:* We employ dynamic panel data methods to cater for several issues such as simultaneity, endogeneity and unobserved biases from bank level heterogeneity. Further, dynamic panel models are also appropriate to cope with the issues of reverse causality that may arise between dependent and explanatory variables. To cope with these and other such potential issues such as elimination of serial correlation, several studies adopt dynamic models such as Dynamic Ordinary Least Squares (DOLS), Instrumental Variables Regression and Two-Stage Least Squares (2SLS) methods with instrumental variables. However, (Hall, 2005) has shown that these techniques are not that much robust as they do not account for heteroscedasticity. (Baum et al., 2003) calls it an omnipresent issue in empirical research and suggests taking advantage of the GMM’s orthogonality conditions to cater for heteroscedasticity of unknown form. Thus in this study we follow the procedures outlined by (Arellano & Bover, 1995) and (Blundell & Bond, 1998) and employ a two-step system Generalized Method of Moments (GMM) technique.

The System GMM is an extension of the standard GMM approach proposed by (Arellano & Bond, 1991). Furthermore, (Hall, 2005) argues that system GMM is more efficient than 2SLS as it accounts for heteroscedasticity and is free of the requirements for distributional assumptions about the error term, which in many cases could be a huge advantage. Moreover, the system GMM is shown by (Baltagi, 2008) to produce more precise and efficient estimates compared to the standard GMM and helps to reduce biases and precision issues by way of differencing variables.

The system GMM is first estimated in levels and then in differences by including lagged explanatory variables as instruments. The right hand side variables in a system GMM are considered as endogenous variables and are allowed to orthogonally adopt their first differenced lags as instruments. Following (Kasman & Kasman, 2015) we include a lagged explanatory variable for bank stability measures. As a relatively unstable bank is likely to exhibit distress in the following period which is an indication of the persistency in bank risk taking behavior.

Finally, to test the stability and goodness of fit of our estimated models, we apply the Hansen-J Test and AR (2) test to check for the over identifying restrictions and second order correlation respectively. When both the Hansen-J test and the AR(2) tests are insignificant at a given level of confidence interval, show the validity that the identifying restrictions are valid and that second order correlation among first-differenced errors do not exist respectively.

*Sampling and Data*

Our sample period comprises of the post reforms era and spans from 2004 to most recent 2017 whereby the regulatory, supervisory and disciplinary requirements of Basel II accord was adopted in Pakistan. Data is collected from the official annual financial statements for 30 scheduled banks.
Findings

Lerner Index

The mean annual Lerner index are reported in Table 1 and their evolution through the sampled period is depicted in Figure 1. A great advantage of Lerner over other measures of competition and market power is that it provides a direct measure of pricing power per year at bank level.

Table 1: Lerner Index over the sampled period

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<tr>
<td>2004</td>
<td>0.434</td>
</tr>
<tr>
<td>2005</td>
<td>0.531</td>
</tr>
<tr>
<td>2006</td>
<td>0.515</td>
</tr>
<tr>
<td>2007</td>
<td>0.549</td>
</tr>
<tr>
<td>2008</td>
<td>0.613</td>
</tr>
<tr>
<td>2009</td>
<td>0.657</td>
</tr>
<tr>
<td>2010</td>
<td>0.632</td>
</tr>
<tr>
<td>2011</td>
<td>0.617</td>
</tr>
<tr>
<td>2012</td>
<td>0.623</td>
</tr>
<tr>
<td>2013</td>
<td>0.596</td>
</tr>
<tr>
<td>2014</td>
<td>0.556</td>
</tr>
<tr>
<td>2015</td>
<td>0.492</td>
</tr>
<tr>
<td>2016</td>
<td>0.414</td>
</tr>
<tr>
<td>2017</td>
<td>0.381</td>
</tr>
</tbody>
</table>

Consistent with theory, the mean Lerner index indicate competitive conditions in Pakistani banking industry. Overall, the industry witnessed slight to moderate improvement in terms of market power (from 0.434 in 2004 to 0.381 in 2017). On average, the industry remained to be monopolistically competitive during the entire sampled period that could be alluded to the higher level of concentration and amalgamations and stringent monitoring of SBP. The intuition of this line of reasoning is consistent with that of (Beck et al., 2006; Beck, 2007). Moreover, increased consolidation can potentially lead to collusion among larger banks as corroborated by (Bos et al., 2013).
Furthermore, our results are in line with (Bikker et al., 2007; Claessens & Laeven, 2004; Hassan, 2009; Khan & Riazuddin, 2009). In addition, the downward bias of competition levels despite multilevel deregulations and liberalization reforms, are also in line with recent empirical literature such as (2008; Bos et al., 2013; Degl’Innocenti et al., 2017; Koetter et al., 2012; Stiroh & Strahan, 2003) among others. However, these findings are in contrast with (Hanif, 2017; Mirza et al., 2016) who reports perfect competition through estimation of Panzer and Rosse H-statistic for Pakistan, to which, our results are difficult to compare if not comparable at all.

**Impact of Market Power and Capital Requirements on Banking Stability**

Table 3 reports findings estimated through two step dynamic system GMM, suggesting significantly positive influence of market power in case of liquidity risk whereas negative influence in terms of default risk. Indicating that increased competition results in decrease in riskiness of banks. This line of reasoning is consistent with the competition stability view.

Focusing on the liquidity risk, reveals that market power positively influences liquid assets and hence decreasing liquidity risk in the case of Pakistan. The estimated coefficients are statistically significant and consistent across specifications. These findings are in line with (Sarkar & Sensarma, 2016) who reported similar findings for Indian banks. Moreover, profitability measure is positively influencing liquidity ratio suggesting that those banks who are generating higher profits will tend to have lower liquidity problems. However, the coefficient is statistically insignificant. Similarly, coeffi-
cient for size and cycle are significantly positive indicating that large banks are having slightly higher levels of liquid assets and that these large banks may not have difficulties in meeting their obligations. Similarly, higher level of economic activity is also associated with holding slightly higher levels of liquid assets in the case of Pakistan. These findings are consistent with (Sarkar & Sensarma, 2016).

Similarly, in line with the competition stability view, market power is negatively affecting default risk. This finding is in contrast with (Forssbaeck & Shehzad, 2015) and suggests that increased competition is negatively associated with default risk. Similarly, ROA, size and cycle are negatively associated with default risk suggesting that increased profitability, enhanced economic activity and larger bank size will result in lower default risk in the case of Pakistan.

Table 2
Descriptive Statistics and Pairwise Correlations

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Maximum</th>
<th>Minimum</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>LR</td>
<td>0.472</td>
<td>0.127</td>
<td>0.819</td>
<td>0.074</td>
<td>385</td>
</tr>
<tr>
<td>DR</td>
<td>2.126</td>
<td>3.684</td>
<td>28.190</td>
<td>-2.854</td>
<td>385</td>
</tr>
<tr>
<td>Lerner</td>
<td>0.706</td>
<td>0.197</td>
<td>0.867</td>
<td>-2.028</td>
<td>385</td>
</tr>
<tr>
<td>CAR</td>
<td>16.555</td>
<td>10.244</td>
<td>61.83</td>
<td>-4.62</td>
<td>385</td>
</tr>
<tr>
<td>ROA</td>
<td>0.378</td>
<td>1.943</td>
<td>6.430</td>
<td>-7.430</td>
<td>385</td>
</tr>
<tr>
<td>Size</td>
<td>18.890</td>
<td>1.375</td>
<td>21.710</td>
<td>15.207</td>
<td>385</td>
</tr>
<tr>
<td>Cycle</td>
<td>3.821</td>
<td>1.401</td>
<td>6.18</td>
<td>1.61</td>
<td>385</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>LR</th>
<th>DR</th>
<th>Lerner</th>
<th>CAR</th>
<th>ROA</th>
<th>Size</th>
<th>Cycle</th>
</tr>
</thead>
<tbody>
<tr>
<td>LR</td>
<td>1</td>
<td>0.278</td>
<td>0.087</td>
<td>0.358</td>
<td>0.305</td>
<td>0.232</td>
<td>0.204</td>
</tr>
<tr>
<td>DR</td>
<td></td>
<td>1</td>
<td>0.152</td>
<td>0.137</td>
<td>0.676</td>
<td>0.315</td>
<td>0.139</td>
</tr>
<tr>
<td>Lerner</td>
<td></td>
<td></td>
<td>1</td>
<td>0.181</td>
<td>0.287</td>
<td>0.306</td>
<td>0.217</td>
</tr>
<tr>
<td>CAR</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>0.399</td>
<td>0.078</td>
<td>0.085</td>
</tr>
<tr>
<td>ROA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>0.445</td>
<td>0.220</td>
</tr>
<tr>
<td>Size</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0102</td>
<td>1</td>
</tr>
<tr>
<td>Cycle</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

Focusing on the restraining effects of capitalization requirements on stability indicators, we postulate that risk exposure of banks will be reduced with higher capital buffers. Our results support this view suggesting that holding higher capital will significantly reduce bank’s risk exposure in terms of liquidity as well as default risk. These findings are consistent with most of the relevant literature.
Moreover, for robustness purposes, we also report bank level fixed effects for both models. Where it can be clearly observed that our results largely remain unchanged and are robust across specifications with only a few exceptions. However, we prefer and go by the results of two step system GMM for its dynamic nature and properties.

Table 3
Regression Results

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Liquidity Risk</th>
<th>Default Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>GMM FE</td>
<td>GMM FE</td>
</tr>
<tr>
<td>Constant</td>
<td>-0.839 (0.198)*</td>
<td>2.789 (1.817)***</td>
</tr>
<tr>
<td>Lerner</td>
<td>0.077 (0.054)***</td>
<td>-2.569 (0.803)***</td>
</tr>
<tr>
<td>CAR</td>
<td>0.037 (0.001)**</td>
<td>-0.035 (0.014)*</td>
</tr>
<tr>
<td>ROA</td>
<td>0.012 (0.009)*</td>
<td>-0.598 (0.014)***</td>
</tr>
<tr>
<td>Size</td>
<td>0.064 (0.009)***</td>
<td>-0.024 (0.138)**</td>
</tr>
<tr>
<td>Cycle</td>
<td>0.066 (0.004)***</td>
<td>-0.188 (0.053)***</td>
</tr>
<tr>
<td>F-Stat</td>
<td>24.96*</td>
<td>97.18*</td>
</tr>
</tbody>
</table>

| R² Within          | 0.426          | 0.608         |
| Between            | 0.742          | 0.868         |
| Overall            | 0.561          | 0.704         |
| AR2 Test           | -0.33 (0.742)  | -0.17 (0.85)  |
| Hansen J Test      | 19.28 (0.38)   | 21.22 (0.19)  |

* ** and *** indicates statistical significance at 1, 5 and 10% levels respectively. Robust standard errors are reported in parenthesis

Finally, the estimated specifications exhibit strong goodness of fit as all of the estimated F-statistics are highly significant. Similarly, AR2 test indicates that second order correlations among first differenced errors do not exist in our estimated models. Similarly, the Hansen J-statistics is also found to be insignificant indicating that the identifying restrictions are valid.
Discussion

Given the unique services provided by the banks, soundness and stability concerns were always at the center of banking policy debates (Danisman & Demirel, 2018). In the banking literature, the tradeoff between competition and stability has resulted in two opposing views. The one advanced by (Keeley, 1990) is commonly known as the competition fragility view, which has drawn major support in the literature. On the other hand, a relatively new body of literature supports the competition stability view advanced by (Boyd & De Nicolo, 2005).

Given these opposing predictions, in this study, we tested the two views for Pakistani banking industry. Using a relatively recent annual data set (2004 to most recent 2017, a period characterized by extensive and sweeping regulatory changes, consolidations and other market pressures that could potentially alter the competitive landscape and condition banks’ behavior), for an unbalanced panel of 30 banks, we used dynamic panel data analysis techniques of two step system GMM. Our findings could be summarized as follows.

The Lerner index for market power reveals that monopolistic conditions prevail in Pakistani banking industry. These dynamics could be attributed to the increased concentration and recent wave of amalgamations in the industry commensurate with the too big to fail sentiment and can have profound implications as it can potentially lead to collusive practices among others (Bos et al., 2013). These findings are in contrast to (Khan & Hanif, 2017a, 2017b, 2017c; Mirza et al., 2016) who found perfect competition in the case of Pakistan utilizing various measures of competition. However, our findings are consistent with (Bikker et al., 2007; Claessens & Laeven, 2004; Khan & Riazuddin, 2009).

Subsequently, we tried to find out the effects of market power on risk measures including liquidity and default risk indicators. Our findings render support towards the competition stability paradigm of (Boyd & De Nicolo, 2005) in both cases. Suggesting that infusing further competition will lead to enhanced stability in the banking industry. These findings are consistent with (Demsetz et al., 1996; Salas & Saurina, 2003; Bofondi & Gobbi, 2003; Beck et al., 2006; Berger et al., 2009; Agoraki et al., 2011; Forssbaeck & Shehzad, 2015) among others.

Finally, we introduced capital requirements as a determinant of risk and find evidence in favor that higher capital buffers make the banks more risk averse (Keeley, 1990; Allen & Gale, 2000; Hellmann et al., 2000; Ghosh, 2009; Sarkar et al., 2016). This further imply that higher capitalization ratios should be encouraged.

4 Recently the central bank of Pakistan designated three domestic banks to be systemically important.
Conclusion

Given that, competition stability nexus has been established in the case of Pakistan. This essentially implies that at policy level, infusing greater competition may break the monopoly power and may lead to higher stability. Our results support this view to improve the competitive conditions of banking industry by and large. In addition, we suggest to mediate the tradeoff between competition stability and or fragility with regulatory tools such as capital requirements which is found to be strongly associated with risk exposure of banks. This essentially imply that as banks will have greater capital buffer, there will be lesser stability concerns.

Limitations

Just like any other study, this study too has certain limitations. For instance we largely rely on accounting based data and ignores market based instruments for risk measures. Moreover, we did not study the underlying causes that resulted in changes in competitive conditions in the banking system. In addition, we relied on a single measure of competition only, which could be a major binding factor in terms of alternative implications. Finally we introduce all the banks into our analytical framework controlling only for size and profitability and did not differentiate between different types of banks such as Islamic and conventional banks or public, private and local and foreign banks. Similarly, we ignored Islamic banking window operations of several conventional banks which could reveal an entirely different story.

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ROLE OF COMMUNICATION AND PARTICIPATION IN PROMOTING EMPLOYEES OPENNESS TO CHANGE: MEDIATING ROLE OF TRUST IN SUPERVISOR

Ayesha Nazish Butt¹, Dr. Sumaira Rehman² and Khadija Mushtaq³

Abstract

This paper is based on exploring how managers’ communication with employees and employees’ participation in decision making plays its role for promoting their openness towards change through a mediator i.e. trust in supervisor. This research is conducted within the context of public sector schools working in Punjab province of Pakistan. Structured questionnaire was used as a source of data collection. 397 questionnaires were distributed randomly among teachers of public schools in Pakistan. Hypotheses were tested by using SEM. Findings supported that all the variables (managerial communication, employee participation, and trust on supervisor) showed significant impact upon openness of organizational workforce towards change process. Moreover, the influence of employee participation and managerial communication on employee’s openness towards accepting change is partially mediated via ‘trust in supervisor’. This study provide insight to leaders or supervisors who are more close to workers that which factors (such as employee participation and managerial communication) play significant role for overcoming resistance from employees in the era of change.

Keywords: Employee Participation, Managerial Communication, Trust in Supervisor, Openness to Chang, Education.

JEL Classification: Z000

Introduction

Organizations are facing intense changes in their external environments over the past decades. So due to an indication of such large-scale and insightful changes in the global environment, change and alteration cannot be dealt as an option; it is now vital for achieving the enduring accomplishments and success of global businesses (Myrtle et al., 2008).

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For meeting the competitive environment of this global era education is one of the most suitable options. It was mentioned by Kazmi (2004) that development of human beings can be done through educating them. Memon (2007) also identified that there exists a close relation between education and relative development but the developmental signs in Pakistan, after more than five decades, are not showing affirmative and positive results. To deal this problem, article 25-A from the “Constitution of Pakistan” make the government responsible for providing high quality education, free of cost to all children who fall in age category of 5-16 years (Ali, 2015). So, government is playing critical and vital role in making quality education affordable and accessible through interventions in public sector of education. Change is promoted in public sector by delivering quality, affordability and sustainability in education for the masses of Pakistan (Change in Education, 2013).

Marvelous and wonderful efforts are made which are aimed at improving access to education for this, incentives are provided including provision of free textbooks, missing infrastructure and stipends are provided to the girl students to increase their enrolments (Punjab Education Sector Reform Programme). Furthermore, government of Pakistan has taken the initiative to start a ‘4-year literacy’ program through which free education will be provided to approximately three million children, who have very poor family background along with special focus on girls to make education accessible for them (Farooq, 2014). Public schools of province Punjab are targeted for this research because public sector schools have been performing poorly in comparison with the private schools from the past many years. In the recent years, government intervention has taken place and government has promoted changes in order to make education available to even the lowest class.

Moreover, the basic phenomenon understudy in this research paper is the role of managerial communication (MC) and employee’s participation (EP) in promoting their openness towards change through the mediating role of supervisory trust in public schools of Punjab, Pakistan. The issue under consideration is important mainly because trust in supervisor, is an important issue in an organization to bring change, and without giving employees empowerment to make decision and informing them about changes going to take place in organization, change is unlikely to take place. According to Asgari, Ahmadi, and Jamali (2015) mutual interconnectedness and trust worthiness between individuals working together in a particular work process, develop a very motivating culture of the organization, which in turn enhances total performance, consequently resulting in a steady excellence of an organization. As indicated by Magner et al. (2011) that an organization can build its employees trust on their supervisors by allowing them to participate give suggestions while making any decision, as well as, the perceived effectiveness of communication between management & employees and trust were significantly related to each other (Zeffane et al., 2011). To bring openness to change among employees, ensuring participation of employees in decision making process (Wanberg & Banas, 2000), communication with management (Lautner, 1999) and trust in supervisor (Devos & Buelens, 2006) are key ingredients.
Problem Statement

A study conducted in 2009 highlighted problems that public sector schools were facing including large number of students, poor results, poor performance of heads in respect of decision making and leading, inappropriate behavior and motivation of teachers, poor capability to enhance creativity among students, lack of computer labs and old curriculum (Imran, 2011). Currently the issues such as communication with management, managerial trust and commitment are getting importance yet studies examining the interaction between all of these three variables are lacking (Zeffane et al., 2011). So the problem statement is formulated as:

How communication from the side of managers and participation form the side of employees helps in promoting workforce openness towards accepting change through the mediating role of supervisory trust in public schools of Pakistan?

Objective

Main aim of this research is: To examine the influence of communication from managers and participation from employees in promoting employee’s acceptance towards change through the mediating role of trust on supervisor in public schools of Pakistan.

Theoretical Background and Hypotheses

Employee Participation

The term employee participation was used as “a voice of the employees in decision making process” (Delaney, 1996). Whereas, it is also defined as “a process of employee involvement designed to provide employees with the opportunity to influence and where appropriate, take part in decision making on matters which affect them” (CIPD, 2009). In many countries the term participation looks as if it is grounded on a difference in the powers and roles of employers and with their workforce, each having their specific set of accountabilities and responsibilities (Arrigo & Casale, 2010). Participation is considered to be equally effective for both managers and lower level employees as well as there is no difference in manufacturing, service, and research firms, in term of taking advantage through the usefulness of participatory behaviour by their employees (Miller & Monge, 1986). Employee’s participation play self-effacing role for the acceptance of situation (Wagner & Gooding, 1987). According to Rodda (2007), the increased participation of employees and supervisory support are proved to be positive predictors of employee’s openness to change. Also, participation while making any decision is vital contributor in building the employees feeling of satisfaction with supervisor and with work (Schuler, 1980). Moreover, employee participation in the process of change brings positive effects for organization whereas the degree of employee participation is predicted by perceived participation opportunities, supervisory support and constructive change attitudes which
were integrated into one scale (Antoni, 2004). Therefore, it is expected that;

**H1:** Participatory behavior of employees has significant influence on employees’ openness towards accepting change.

**H2:** Participation from employees has significant influence on building trust in their supervisors.

![Proposed Research Model](image_url)

*Figure 1: Proposed Research Model*

**Managerial Communication**

The communication is considered important in the change process as it was indicated by Neves and Eisenberger (2012) that managerial communication with their employees have positive relationship with the temporal change in perceived organizational support (POS). Particularly the results of another study on human resource management (HRM) suggest that direct discussion and consultation between higher management and employees is important element in the major change processes (Morgan & Zeffane, 2003). Moreover, change-related communications are essential for creating readiness for change in an organization (McKay, 2012), as well as, communication and trust are the strongest associated variables (Zeffane et al., 2011). According to Kelloway and Chawla (2004) it is revealed that managerial communication can directly or indirectly influence openness to change. Therefore, it is expected that;

**H3:** Managerial communication has significant influence on openness of employees to accept change.

**H4:** Communication from managers has significant influence on employees’ trust in their supervisors.

**Trust in Supervisor and employees’ Openness towards Change**

Openness of workers towards accepting the change is an important component for bringing change. Armenakis and Bedeian (1999), state that openness to change (OTC) can be defined as “an individual’s adaptation to the dynamic and diverse global business environment”. Whereas, according to Shin (2012), employee openness to change is due to two factors: one is his/her own psychological resilience while inducements from organizations size also play a positive role.

Trust-in-supervisor can be defined in term of employee tendency to trust and supervisors
own attributes such as his ability, integrity and generosity (Poon, Rahid, & Othman, 2006). For building the trust of employees direct leaders or supervisors play particularly important role (Dirks & Ferrin, 2002). It is mainly because employees trust on their supervisors or leaders has been considered as a valuable tool behind the positive outcomes of an organization (Hassan et. al., 2012). Therefore, it is expected that;

\[ H5: \text{Employee’s trust in their supervisors has strong influence on employee’s openness towards accepting change.} \]

**Trust in Supervisor as a Mediator**

Openness of employees towards the change is derived from the context-specific variables such as information received about changes and involvement of workers in the PDM i.e. process of making decision regarding upcoming changes (Wanberg & Banas, 2000) and trust on supervisor and executive management (Devo & Buelens, 2003). It is suggested that management of organizations should encourage their employees to have a) active participation & involvement in organizational PDM, b) build confidence and c) communicate transparently about the need for change (Boohene & Williams, 2012).

Ariani and Ebrahim (2005) also suggest mangament that it is better to give employees opportunity to contribute in the process of making decisions and also revealed through survey results that employee participation and managerial communication have significant relation with trust in organization and these measures can also improve employees trust in leaders and top managers. Trust is an essential feature while developing the communication relationship (Wulandari & Burgess, 2010), as well as, the trust in supervisor play a role of mediator between communication provided by management and employees openness to accept change within organization (Ribbers, 2009). According to Mahajan et al. (2012) trust in top management play a role of mediator between managerial communication and OC i.e. organizational commitment act as a partial mediator between employee involvement and organizational commitment. Survey results of another study showed that trust on supervisor can fully mediate the effect of MC on workers’ openness to accept organizational change and it can partially mediate the relationship between openness to change (OTC) and employee participation (Ertürk, 2008). Therefore, it is hypothesized that;

\[ H6: \text{Trust on supervisor play mediatory role between participation of employees and their openness towards accepting change.} \]

\[ H7: \text{Trust on supervisor play mediatory role between communication from managers and workers openness towards accepting change.} \]
Methodology

Research Approach

For this research, assumption underlying in the positivism approach was followed because the main aim is to investigate those factors which play important role for promoting employees’ openness to change in education sector i.e. to investigate the role of MC and EP in promoting employees’ OTC through a mediator i.e. trust in supervisor in public schools of Pakistan. As, it was suggested by Creswell (2003) that “if the problem is to find out the factors that can influence outcome or to test theory or explanation, then positivism (quantitative approach) is most suitable”. Therefore, this research was carried out using survey method and source used was questionnaire (close ended questions) for data collection and statistical analysis for drawing results of this research (Creswell & Clark, 2011).

Sampling Design

Zikmund (2003) defined sampling as “The process of using a small number of items or parts of a larger population to make conclusions about the whole population”. Data for this study was collected from education sector (public schools) of Punjab, Pakistan which has undergone changes in terms of its affordability and availability. There are total 57418 public schools in Punjab, Pakistan which are divided as higher secondary, high, middle, MPS, primary and sMosque schools (School Education Department- Government of Punjab, 2015). Formula of Yamane (1967) was used, i.e. \( n = \frac{N}{1 + Ne^2} \), where \( n \) = sample size, \( N \) = Population (57418), \( e \) = margin of error (0.05), is applied to determine the sample size. After applying the formula, sample size was determined to be 397 schools. Total 397 questionnaires were distributed randomly among the schools mentioned above. Principle of the targeted school was requested to fill the questionnaire on behalf of school to represent the true system of the school. Total 325 questionnaires were filled and returned; out of which 300 (75.5 percent) was usable response.

Instrument for Data Collection

For this study questionnaire technique of field survey was used for collecting data from respondents.

Measures

The questionnaire of this research contains information regarding following measures.

- Background information
- Openness to change
- Managerial communication
• Employee participation
• Trust in supervisor

Managerial communication was measured with the help of three dimensions i.e. communication responsiveness, task and career communication. These dimensions were measured by adopting a scale developed by Penley and Hawkins (1985). Employees’ participation was measured by adopting a well calibrated scale developed by Ashford (1988). Supervisory trust was measured by adopting a scale which was developed by Nyhan and Marlowe (1997). Openness to change was measured by scale adapted from Desrosiers (2006). All of the scales used to measure the constructs understudy, were ‘Five Point Likert-type’ scales.

Data Analysis

Statistical Techniques

The multivariate statistics was used analyzed the data, which was collected through questionnaire. Reliability of the data collected in this research study was measured by using Cronbach’s Alpha. Following the Reliability analysis of the data, descriptive statistics (Frequency) was used to gain insight about data. After this, structure equation modeling technique was used in order to check the relationship among variables i.e. to verify hypothesis.

Reliability Test

Reliability of data collected via questionnaires was ensured through Cronbach’s Alpha technique. Cronbach’s Alpha was estimated for each individual construct as well as at collective level.

Table 1
Reliability Statistics

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Cronbach's Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Openness to Change</td>
<td>0.78</td>
</tr>
<tr>
<td>Trust in Supervisor</td>
<td>0.89</td>
</tr>
<tr>
<td>Employee Participation</td>
<td>0.85</td>
</tr>
<tr>
<td>Managerial Communication</td>
<td>0.82</td>
</tr>
<tr>
<td>Whole Questionnaire</td>
<td>0.94</td>
</tr>
</tbody>
</table>

Cronbach's Alpha for the all of variables is given in Table 1 which range between 0.89 - 0.78. These values are well above the cutoff point of Cronbach Alpha.
Descriptive Analysis

One hundred and eighty respondents (180) out of 300 were male (60%) and 222 respondents were married (74 percent). Nine respondents had Inter degree (3 percent), eighty-four respondents (28%) had Bachelor’s educational qualification and 205 respondents had Master’s degrees (68%).

Results

Structural model fitness was assessed by examining the variety of fit indices. For the hypothesized model of this research study, the value of (CMIN/DF) is 2.287, GFI and AGFI indices are 0.974 and 0.961 respectively. CFI value equals to 0.977 and RMSEA is 0.056. All indices met the criteria of their recommended values; therefore, hypothesized model (i.e. relationship of MC and EP with employees’ OTC through mediating variable, trust in supervisor) is acceptable.

Table 2
Criteria for goodness of Fi

| Criteria of Goodness for Structural Model |
|-----------------|-----------------|-----------------|-----------------|-----------------|
| CMIN            | DF              | P               | CMIN/DF         | GFI             |
| Model Values    | 466.531         | 204             | .000            | 2.287           |
| Recommended     | ≤3              | ≥0.9            | ≥0.9            | ≤0.05           |
| GFI             | 0.974           | 0.961           | 0.977           | 0.056           |
| AGFI            |                 |                 |                 |                 |
| CFI             |                 |                 |                 |                 |
| RMSEA           |                 |                 |                 |                 |

According to Table 2, criteria for measuring the goodness of fit stands within acceptable range. Hence this model is found fit for prediction due to its validity.

Hypothetical Analysis

Hypothetical analysis reveal that there is positive and significant relationship of employee participation with openness to change ($\beta = .327, \ t = 3.083, \ p < 0.05$) and with trust in supervisor ($\beta = .154, \ t = 2.051, \ p < 0.05$); thus, supporting the hypothesis H1 and H2 respectively. In H3 it was hypothesized that managerial communication influence employees’ openness to change. Results reveal support for this stated relationship ($\beta = .512, \ t = 3.975, \ p < 0.05$) and therefore H3 is accepted in this research. Findings also indicated that variation in employee’s trust in their supervisors is being explained by managerial communication ($\beta = .510, \ t = 5.852, \ p < 0.05$); thus supporting H4. Moreover, it is also found that variation in employee’s openness to organizational change is being caused by employee’s trust in their supervisors ($\beta = .484, \ t = 8.657, \ p < 0.05$); hence, proved H5 of this research. The path coefficients proposed relationships in the model of study are reported in the Table.
3 and Figure 2.

Table 3

Results Summary

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>DV</th>
<th>IV</th>
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<th>C.R</th>
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</tr>
</tbody>
</table>

Figure 2: Path coefficients Diagram
Note: OTC= Openness to Change; TIS= Trust in Supervisor; EP= Employee Participation; MC= Managerial Communication.

Mediation Analysis

H6 proposed that effect of participation on openness to change is mediated through their trust in supervisors. The effect of mediation is checked according the process outlines by Baron and Kenny (1986). Accordingly, it is said that mediation occurs through four conditions. First, the independent variable (employee participation) must affect the mediator (trust in supervisor) which is proved by H2; second, mediator must affect dependent variables (openness to change) while controlling for independent variable which is proved by H5; third the IV (employee participation) must affect the DV (openness to change) which is proved by H1; and fourth, the beta coefficient between the IV (EP) and DV (OTC) should either reliably reduce the effect or it can become non-significant when the mediator effect is included. β value without mediator was 0.703 but after including mediator i.e. trust in supervisor β value of employee participation was reduced to 0.667 indicating that mediation has occurred but the value has not reached zero showing that partial mediation has taken place.

In order to check the significance of mediation, Sobel test was applied. T-value of Sobel test was 2.549 and p-value was found to be 0.010<0.05 indicating a significant role of mediation. So H6 is supported. Similarly, H7 proposed that the effect of managerial communication on employees’ openness to organizational change is mediated through employee’s trust in their supervisors. This hypothesis is also proved according to the process outlines by Baron and Kenny (1986). The first three conditions of mediation as proposed by H7 are fulfilled above (i.e. can be seen in H3, H4 and H5) and to prove fourth condition, β value without mediator was 0.712 but after including mediator i.e. trust in supervisor β value for managerial communication was reduced to 0.672 indicating that partial mediation has taken place. In order to check the significance of mediation, Sobel test was applied. T-value of Sobel test was 3.074 and p-value was found to be 0.002<0.05 indicating a significant role of mediation. Hence, the results provide support for the H7. These findings clarify the relationships between communication, participation, employee’s trust on their supervisors and their openness to accept change. Moreover, these findings also provide insight about the mediating role of employees trust on their supervisor.

Discussion

Analytical finding of this research proposed that employees’ openness to change is function of several influences. Findings supported that communication; participation and trust appear to have a highly significant impact on OTC. Moreover, effect of MC and EP on their openness towards accepting change is partially mediated through trust on their supervisors. Consistent with the findings of Rodda (2007), it is proved that increased participation of employees is a significant predictor of employee’s OTC. Consistent to the studies of (Antoni, 2004), this study proves that employee partici-
participation is based on the supervisory support and trust. This study also proves that there is a positive association among MC and employee’s OTC as was proved by (Morgan & Zeffane, 2003). This study also supports a positive relationship between managerial communication and workers’ trust in their supervisors which is comparable to the study conducted by Zeffane et al. (2011). Consistent to the findings of (Hassan et al., 2012), it is proved that significant relationship exists between employee’s trust in their supervisors and positive outcomes of an organization (i.e., employee’s openness towards accepting change).

This study has proved that effect of EP on OTC is mediated through employee’s trust in their supervisors as proved by Wanberg and Banas (2000) and Devo and Buelens (2003). Consistent to the findings of Ertürk (2008), this study proves that MC influence on openness for accepting change is mediated through employee’s trust in their supervisors. This study finds out the implication of the change adopted and its results and also demonstrate that what it role it can play in informing public sector schools about the current situation and further changes that they can make for the betterment of their system. This study also provides suggestions for those organizations which undergo from the large scale change. Most importantly it suggests that employee’s reaction towards change matters a lot in the situation of implementing change. The findings highlight the role MC and EP in influencing employee responses towards change. Workforce may be more prompted to the openness of change by a resource close to them (e.g., supervisor) so trust in supervisor is integral to the key findings.

Mediation effect of supervisory trust between the openness to accept change with managerial communication and with employee participation is most important. Research in the area of change can guide organizational leaders or supervisors who are more close to workers to obtain a better understanding of factors which can bring change by overcoming resistance from employees. Few limitations to be discussed here includes, 1) limited generalization due to limited targeted population area wise i.e. only one province of Pakistan. Hence, it can be eliminated via conducting it in future by considering larger sample. This study is cross sectional in nature, however, to evaluate the effect of EP and MC on employees’ openness towards accepting change via trust, it is suggested that longitudinal studies can be conducted. It is because change is the core of any business and no business can survive in the dynamic environment by being rigid. It also tells how communication and participation can play an effective role in accepting and implementing change and what the organizations can do to bring employee’s openness towards change.

Implication of the study

This study is important because it provide insight to leaders or supervisors who are more close to workers that which factors (such as EP and MC) are significant for overcoming resistance from employees in the era of change. This study also increases the understanding of how participatory behavior of employees in taking decision and managerial communication about important matters helps in promoting employees openness towards accepting change via building trust among them.
Moreover, this research adds an insight into the literature through exploring shared effects of employee participation, managerial communication on employees’ openness towards accepting organizational change in the presence of supervisory trust, especially within different cultural perspective i.e. Pakistan.

References


Morgan, D., & Zeffane, R. (2003). Employee involvement, organizational change and trust in


### Regression Estimates

<table>
<thead>
<tr>
<th>Label</th>
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INFLUENCE OF SERVANT LEADERSHIP ON EMPLOYEES’ BEHAVIOURAL OUTCOMES IN CULTURES WITH HIGH POWER DISTANCE ORIENTATION

Muhammad Azeem Qureshi¹, Dr. Kazi Afaq Ahmed² and Dr. Syed Irfan Hyder³

Abstract

Inadequacies of leadership character have resulted in failure of many businesses. Servant leadership is one of the character-driven leadership models that emerged to address these inadequacies but this leadership approach is found to be less-effective in cultures with high power distance orientation. Drawing on conservation of resource theory and leader-member exchange theory, this study uses AMOS and PROCESS to perform confirmatory factor analysis and to test proposed hypotheses respectively. Results suggest that servant leadership positively influences innovative work behavior and organizational citizenship behavior. However, this study does not find any support for power distance orientation as a moderator. High religiosity is the possible cause for such finding which gives direction for future research. This study has theoretical and practical implications.

Keywords: Servant Leadership, Innovative Work Behavior, Organizational Citizenship Behavior, Power Distance Orientation.

JEL Classification: O150, L200

Introduction

Failure of well-known companies such as Enron, Tyco, WorldCom and many others in the world is associated with ethical leadership crisis, therefore emergence of value-laden leadership comes as no surprise (Sendjaya, Sarros, & Santora, 2008). Servant leadership is another addition into the existing leadership literature which addresses inadequacies of leadership character. Greenleaf (1970) originated the term “servant leadership” with the core theme of “going beyond one’s self-interest”. Research on servant leadership has been overlooked after its origination until the last decade.

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Scholars have urged to deduce servant leadership theory in different cultural context to legitimize it as a mainstream leadership model (Chiniara & Bentein, 2016).

Servant leadership literature is consistent with respect to its positive outcomes at individual and organizational level (Bobbio, Van Dierendonck, & Manganelli, 2012; Chiniara & Bentein, 2016; Donia, Raja, Panaccio, & Wang, 2016; Newman, Schwarz, Cooper, & Sendjaya, 2015; Tang, Kwan, Zhang, & Zhu, 2015). However, Social norms in Pakistan demand predominantly assertive and authoritative leadership style while people-oriented leadership style such as servant leadership seems to be counter-cultural and a substantial challenge (Ertel, 2017; Simkins, Sisum, & Memon, 2003). In addition, employees with higher power distance orientation take little care about how their leaders treat them (Lin et al., 2013). Therefore, whether leaders treat their followers positively (e.g. servant leadership) or negatively, followers are less likely to show sensitivity to such treatment (Donia et al., 2016; Lian, Ferris, & Brown, 2012). Culture in Pakistan is moderately high in terms of power distance orientation (Hofstede, 2016; Khilji, 2002) but little is known with reference to what influence servant leadership makes on employees’ behavioral outcomes in such culture.

Pressure to remain competitive compels organizations to expect their employees to make extra efforts, come up with innovative ideas and make efforts in promoting and implementing these ideas (Yidong & Xinxin, 2013). Therefore, organizations seek their employees to demonstrate organizational citizenship behavior (Newman et al., 2015) and innovative work behavior (Yoshida et al., 2014). Despite different leadership approaches are found to be positively associated with these behaviors but limited literature has addressed the role of servant leadership in this respect. This research also attempts to fill this gap.

**Contribution & Originality**

The servant leadership theory is in its early stage and requires a deductive approach to be legitimated as a mainstream leadership theory (Mackey, Frieder, Brees, & Martinko, 2015). This study makes an attempt to test servant leadership theory in a different cultural and organizational context to endorse servant leadership construct as a mainstream leadership theory as proposed by Chiniara and Bentein (2016). Further, this study also attempts to address the call for future research proposed by Donia et al. (2016) and Newman, Schwarz, Cooper, and Sendjaya (2015) to examine how servant leadership works in different cultural contexts in order to increase generalizability (Kool & van Dierendonck, 2012). Finally, according to Hofstede (2018), it is uncertain how people of Pakistan will respond to cultural dimension of power distance, it is necessary to examine and validate the role of power distance orientation as a moderator which can dilutes the influence of leadership on different employee-related outcomes. This study makes an attempt to contribute in this respect by examining whether power distance orientation moderates the influence of servant leadership such that the
influence of servant leadership is attenuated.

Research Objectives

This research aims to assess the influence of servant leadership practice on followers’ behavioral outcomes, namely innovative work behavior and organizational citizenship under the moderating influence of power distance orientation.

Literature Review

Servant Leadership

Servant leadership is described as a way of life and not a management technique (Greenleaf, 1977; Greenleaf & Spears, 1998). Servant leaders are those who give value to their subordinates, develop them (Laub, 1999), show concern for their subordinates (Ehrhart, 2004) and with humble attitude (Van Dierendonck, 2011), they are ambitious to serve others (Sendjaya, Sarros, & Santora, 2008). Servant leaders invest great deal of energy and time to understand career goals, interest and capabilities of their followers (Greenleaf & Spears, 1998). Since serving the followers is the supreme priority of servant leaders, they craft an environment that provides opportunities for enhancing followers’ present skills and growing new ones (Liden, Wayne, Zhao, & Henderson, 2008). This serving attitude makes servant leaders role model to their followers (Babakus, Yavas, & Ashill, 2010). Servant leaders empower their follower to grow to what they are capable to be through engaging them relationally, emotionally, ethically and spiritually (Eva, Robin, Sendjaya, Dierendonck, & Liden, 2018).

Servant leadership is not only an ethical theory but also an action-driven leadership approach where service-driven behavior and action-driven behavior of servant leader co-exist and complement each other (Sousa & van Dierendonck, 2017). It is evident that servant leaders, through their serving behavior, gain trust from their subordinates which results in positive employee outcomes (Chan & Mak, 2014). Furthermore, servant leaders foster positive employee and organizational outcome better than any other type of leadership style (Schneider & George, 2011).

Innovative Work Behavior (IWB)

De Jong (2006) defined IWB as a behavior related to creation, promotion and implementation of novel ideas at workplace. There exists a significant relationship between leadership and innovative work behavior (Dzulkfli, 2014). Studies investigated leadership influence on innovative work behavior are consistent with respect to leadership and its positive association with innovative work behavior (Černe, Jaklič, & Škerlavaj, 2013; Dhar, 2016; Imran & Anis-ul-Haque, 2011; Kamaruddin, Adi, Nazir, Arif, & others, 2015). Servant leadership appears to be a better predictor of
innovative work behavior than any other leadership style as servant leaders satisfy the needs of autonomy of their followers. Empowering followers and liberating them to handle difficult situations, learning from mistakes, encouraging followers to be creative, making decisions on their own and providing followers supporting environment to exercise their full potential, are some of the key function servant leaders perform (Liden et al., 2008).

Organizational Citizenship Behavior (OCB)

OCB is defined as an individual’s discretionary behavior which an employee shows by going beyond his/her job description and seek task which are not rewarded by formal reward system (Organ, 1988). OCB is often discretionary and not endorsed by the official reward system (Liden, Panaccio, Meuser, Hu, & Wayne, 2014). A competitive business environment entails ample involvement and discretionary efforts from employee to maintain a competitive edge. Therefore, the role of organizational citizenship behavior has become more important (Detert & Burris, 2007).

Research has suggested that servant leaders inspire their followers through their serving behavior which motivates them to exhibit OCB (Reed, 2015). Followers are more likely to produce various extra-role behaviors when servant leaders put their prime focus on their need fulfillment (Marinova & Park, 2014). A recent study has also identified positive association between servant leadership and OCB (Linuesa-Langreo, Ruiz-Palomino, & Elche-Hortelano, 2018).

Power Distance Orientation (PDO)

PDO is a cultural value (Hofstede, 1980; Lin et al., 2013; Lowe, 2006) which refers to degree to which people believe and legitimize the hierarchical difference between those who possess power and those who do not (Hofstede & Minkov, 1991). The employees with high power distance orientation are less sensitive to social exchange norms (Farh, Hackett, & Liang, 2007). Therefore, irrespective of how leaders treat their followers, followers are less likely to show sensitivity to such treatment in power distance culture (Lian, Ferris, & Brown, 2012). Impact of leadership is inconsistent in power distance cultures (Donia et al., 2016). PDO has been found to be a moderator in several studies. For instance, the mean level of servant leadership was less in Italy than in UK and Netherland (Bobbio et al., 2012) as the power distance orientation in Italy is more than UK and Netherland (House, 2004). Similarly, Morris, Brotheridge, and Urbanski (2005) suggested that virtue-based leadership might be less-effective in male-dominant societies as compared to female-dominant societies. A recent study conducted by Ahmad and Gao (2018) found support to the premise that power distance orientation is more related to leadership practices than any other cultural values in making the impact of leadership less effective when power distance orientation is high.
Theoretical Framework

This study draws on Conservation of Resource Theory which postulates that individuals try to retain and protect resources necessary to fulfill the needs of their daily lives. These resources include physical, social and psychological resources (Hobfoll, 1989). Servant leaders protect these resources by treating individuals as a valuable organizational resource, growing them, developing them and by taking care of their well-being (Gregory Stone, Russell, & Patterson, 2004). This creates a sense of security and safety (Cooper & Thatcher, 2010) and these acts of servant leaders fulfill the physical, social and psychological needs of subordinates (Aryee et al., 2007). Such perception of needs fulfillment and sense of security and safety results in bringing about abundance mentality (Covey, 2014) and consequently helps employees in exhibiting innovative work behavior by originating, promoting and implementing innovative ideas.

This study further draws on Leader-Member Exchange Theory (LMX) which proposes that followers maintain equitable social-exchange by reciprocating the treatment they received from their leaders (Blau, 1964; Dienesch & Liden, 1986). This theory provides the exchange mechanism through which leadership practices are reciprocated, therefore it is contended that subordinates try to reciprocate serving behavior of their leaders by demonstrating organizational citizenship behavior. The following conceptual frame and statements of hypotheses have been developed on the basis of profuse literature and the proposed theoretical framework.

![Research Model](image)

**Figure 1: Research Model**

**Statements of hypotheses**

*H1: Servant leadership positively influences innovative work behavior.*
\textbf{H2:} Servant leadership positively influences organizational citizenship behavior. \\
\textbf{H3:} Power distance orientation moderates the influence of servant leadership on innovative work behavior and organizational citizenship behavior such that the influence of servant leadership is attenuated.

\textbf{Research Methodology}

This study is based on positivist research paradigm which proposes that reality can be attained through observation and experimentation (Henn et al., 2009). Since this study aims to investigate the cause-effect relationship to predict behavioral outcomes in response to leadership behavior, the most appropriate research design for causal research is quantitative research design (Creswell, 2013). The positivist research paradigm also support a researcher uses quantitative method to test hypotheses.

\textbf{Questionnaire Development}

The questionnaire for this study is based on the instruments adopted from widely used and published measurement scales in the field of organizational research. All the scales have appropriate reliability Cronbach’s alpha scores. All the items in questionnaire addressing each variable in the conceptual framework have been measured on a 5-point Likert scale. \textit{Servant Leadership} has been measured through 8-items developed by (Liden et al., 2014) with ($\alpha$) was .84. Innovative work behavior has been measured through 6-items proposed by Hu, Horng, and Sun (2009) with initial reliability ($\alpha$) = .91. \textit{OCB} has been measured through the scale proposed by Lee and Allen (2002) with $\alpha$=.83. While Power distance orientation has been measured through eight items proposed by Earley & Erez (1997) with initial reliability of .81.

\textbf{Sampling}

This study uses purposive sampling, a non-probability sampling technique to gather data from respondents. There are a large number of unregistered organizations in Pakistan which carry out economic activities outside the official reporting system and are beyond the tax net except for the large corporates (Wajeeh, 2017). Most of the small units producing goods and services both from rural and urban areas of Pakistan are undocumented in government statistics and contribute about 71 percent of GDP (Khan & Khalil, 2017). Therefore, it is almost impossible to draw a sample on the basis of probability. However, the issue of generalizability is associated with all non-probability sampling techniques, purposive sampling is common in academic research which is subject to time and resource constraints (Cohen, Manion, & Morrison, 2013). Further, this research gathers dyadic data to avoid common method bias.

A sample of minimum 200 respondent has been suggested as appropriate for factor analysis.
(Thompson, 2004) while Hair, Black, Babin, and Anderson (2010) have suggested a sample of more than 200 respondents is adequate for structural equation modeling. Following this approach, this study uses a sample of 474 respondents to increase generalizability of the study.

Data Analysis Methods

Normality, Validity and Reliability

Normality of the data has been ascertained through Skewness and Kurtosis. Normality of data is confirmed if the values of Skewness and Kurtosis range between ±2.5 and sig. value < .05 (Hair, 2010). It is necessary to assess measuring instruments’ construct validity when instruments have been developed in different cultural context. Since all the constructs which we have used in this research have been developed in the western context, therefore it is necessary to ascertain construct validity of instruments used in this study. Construct validity can be ascertained through discriminant validity and convergent validity (Bryman & Bell, 2015). This study follows method recommended by Hair, Black, Babin, & Anderson (2010) which assess the discriminant validity and convergent validity through Composite Reliability (CR), Average Variance Extracted (AVE) and Maximum Shared Squared Variance (MSV). This method follows the cut-off criteria recommended by Hu & Bentler (1999) which suggests CR > 0.7, AVE > 0.5 and CR > AVE are necessary to establish convergent validity. While discriminant validity is established when AVE > MSV and the square root of AVE is greater than each pair of correlation for all the constructs. Further, Composite reliability has been measured to confirm internal consistency of data (Peterson & Kim, 2013).

Confirmatory Factor Analysis

This study performs Confirmatory Factor Analysis (CFA) to determine goodness of model fit (Hair, 2010). Fit indices used in this study are Chi Square ($\chi^2$), Chi Square/ Degree of Freedom ratio ($\chi^2$/d.f.), Significance (p), Standardized Root Mean Square Residual (SRMR) and Root Mean Square Error of Approximation (RMSEA) for absolute fit indices. Further, for incremental fit indices, this study uses Incremental Fit Index (IFI), Comparative Fit Index (CFI), Tucker Lewis Index (TLI) which is also known as Non-Normed Fit Index (NNFI). The summary of the cut-off values of model-fit indices used for this study are given in Table 1.

Table 1 Classification of Fit Measures

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<td>$PCFI &lt; .5$</td>
</tr>
<tr>
<td>SRMR</td>
<td>$&lt; .05$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RMSEA</td>
<td>$&lt; .05$</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Hypotheses Testing

This study uses SPSS macro PROCESS (Hayes, 2013) to test hypotheses, measurement of moderating effect and interaction term. Independent variable and moderator were mean-centered before analysis by subtracting means from their values (Aiken, West, & Reno, 1991; Hayes, 2013). This research draws separate interaction plots to estimate slopes describing the relationship between SL, IWB and OCB at varying level of power distance orientation. The interaction terms have been calculated by the tool Interaction 1.7 developed by Soper (2013).

Results

Respondents’ Profile

The age of the respondents falls between 20 to 58 years ($M = 32, SD = 8.24$) while there were 320 male and 154 male respondents. 378 respondents were married while 96 were unmarried. Tenure of respondents varies from 2 years to 25 years ($M = 4.6, SD = 5.6$) within the same organization. Among the respondents, 90 (19%) were leaders while 384 (81%) were followers.

Descriptive Statistics

Following Table 2 represents descriptive statistics and normality of data through Skewness and Kurtosis.

<table>
<thead>
<tr>
<th>Table 2</th>
<th>Descriptive Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M$</td>
</tr>
<tr>
<td>Servant Leadership</td>
<td>3.54</td>
</tr>
<tr>
<td>Power Distance Orientation</td>
<td>3.68</td>
</tr>
<tr>
<td>Innovative Work Behavior</td>
<td>3.64</td>
</tr>
<tr>
<td>Organizational Citizenship Behavior</td>
<td>3.52</td>
</tr>
</tbody>
</table>

Since values of Skewness and Kurtosis of all the constructs fall within the acceptable range of ±2.5 (Hair, 2010). It can be concluded that the data set used for this study fulfills the requirement of normality.
Construct Validity

Construct validity has been measured through discriminant validity and convergent validity (Bryman & Bell, 2015). This research follows the cut-off criteria recommended by Hu and Bentler (1999). Table 3 below presents the results of construct validity.

Table 3
Construct Validity

<table>
<thead>
<tr>
<th></th>
<th>CR</th>
<th>AVE</th>
<th>MSV</th>
<th>MaxR(H)</th>
<th>SL</th>
<th>IWB</th>
<th>PDO</th>
<th>OCB</th>
</tr>
</thead>
<tbody>
<tr>
<td>SL</td>
<td>0.903</td>
<td>0.571</td>
<td>0.445</td>
<td>0.907</td>
<td>0.755</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IWB</td>
<td>0.872</td>
<td>0.534</td>
<td>0.146</td>
<td>0.879</td>
<td>0.329***</td>
<td>0.731</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PDO</td>
<td>0.900</td>
<td>0.529</td>
<td>0.003</td>
<td>0.901</td>
<td>-0.058</td>
<td>-0.040</td>
<td>0.727</td>
<td></td>
</tr>
<tr>
<td>OCB</td>
<td>0.928</td>
<td>0.501</td>
<td>0.445</td>
<td>0.943</td>
<td>0.667***</td>
<td>0.382***</td>
<td>-0.006</td>
<td>0.697</td>
</tr>
</tbody>
</table>

Significance of Correlations: † p < .100, * p < .050, ** p < .010, *** p < .001

Results of Table 3 above show that Composite Reliability (CR) of all constructs is greater than .7. Average Variance Extracted (AVE) of all the constructs is greater than .5 CR > AVE, therefore it can be said that all the requirements of convergent validity are fulfilled. Since AVE is greater than MSV and Square Root of all the constructs is greater than the correlation of each pair of their corresponding constructs, discriminant validity is said to be confirmed.
Confirmatory Factor Analysis

Before making any attempt to evaluate the structural model, it is necessary to analyze full latent variable models through assessing the validity of the measurement model (Byrne, 2016). Figure 2 below illustrates the parameters of the measurement.

*Figure 2: CFA for Second-Order Measurement Model*

All the fit indices of the measurement model are within the acceptable range as presented in Table 4 below.
Table 4
Goodness of Fit Indices for the Measurement Model

<table>
<thead>
<tr>
<th></th>
<th>Absolute Fit Indices</th>
<th>Relative Fit Index</th>
<th>Parsimony Index</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\chi^2$ df p $\chi^2$/df SRMR RMSEA CFI TLI PNFI PCFI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>871.42 552 .000 1.58 .04 .035 .97 .97 .90 .85</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Following the CFA of the measurement model, CFA for structural model was performed to ascertain how well the proposed model fits that data. Figure 3 below shows details of structural model’s parameters.

Figure 3: CFA for Structural Model

The Chi-Square statistic $\chi^2$ (586) = 920.18, $p < .05$ which is consistent with results of
second-order CFA, indicating an inadequate goodness-of-fit. Since Chi-Square ($\chi^2$) is sensitive to sample size and significant in most of the cases (Iacobucci, 2010) even with a reasonable sample size (Hair, Black, Babin, & Anderson, 2014). Experts have recommended reporting Normed Chi-Square or Relative Chi-Square ($\chi^2/df$) statistic in order to address Chi Square statistic’s deficiency (Hooper, Coughlan, & Mullen, 2008). The value of $\chi^2/df$ is 1.57 which is less than 3.0 and suggesting good-fit (Kline, 2015).

In addition to $\chi^2$ and $\chi^2/df$ results, the value of SRMR, another absolute fit index, is .04. The value closer to 1 indicates a perfectly fitting model (Hoyle, 2012). Using the 90% confidence interval, the value of RMSEA is .03 which is below .05 and closer to .00, therefore indicating well-fitted model (Weston & Gore, 2006).

Moving to the incremental fit indices, the recommended values ≥ 0.95 for CFI and TLI suggest excellent-fit (Hooper et al., 2008). CFI and TLI are comparatively not affected by sample size (Pituch & Stevens, 2015). The value of both CFI and TLI are .96 indicating good-fit. While the PNFI and PCFI demonstrate a comparatively better fit than the second-order CFA with the values of .85 for PNFI and .90 for PCFI. Since the values closer to 1.0 represent good-fit for PNFI and PCFI (Lomax & Schumacker, 2012), it can be assumed that the model indicates a reasonable-fit for these indices.

Results of Hypotheses Testing

In the light of the theoretical framework, it was hypothesized that servant leadership positively affects innovative work behavior and OCB while power distance moderates the effect of servant leadership. Therefore, this research attempts to test this hypothesis by taking (SL) as a predictor, Power distance Orientation (PDO) as moderator and innovative work behavior (IWB) and organizational citizenship behavior (OCB) as outcome variable. Table 4 below presents the summary of results.
Table 5
Summarized Result of Moderation Analysis

<table>
<thead>
<tr>
<th>Predictor</th>
<th>DV = IWB</th>
<th>DV = OCB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>3.64***</td>
<td>3.53***</td>
</tr>
<tr>
<td>Servant leadership (SL)</td>
<td>.26***</td>
<td>.62***</td>
</tr>
<tr>
<td>Power distance orientation (PDO)</td>
<td>-.03†</td>
<td>.02+</td>
</tr>
<tr>
<td>SL x PDO</td>
<td>.12†</td>
<td>.08†</td>
</tr>
<tr>
<td>( R^2 ) Change</td>
<td>0.1†</td>
<td>0.00†</td>
</tr>
</tbody>
</table>

\( N = 474 \), Confidence level = 95% for 10000 bias corrected bootstrap samples, **\( p < .001 \), *\( p < .01 \), †\( p < .05 \), ††\( p > .05 \)

Table 5 shows that the influence of SL on IWB is positive and significant (\( b = .26, p < .001 \)) while the influence of SL on OCB is also positive and significant (\( b = .62, p < .05 \)). However, the interaction between SL and PDO is insignificant for IWB (\( b = .12, p > .05 \)) and OCB (\( b = .12, p > .05 \)). To better understand the moderating effect of power distance orientation, the plot of interaction at two levels of power distance orientation (1 SD below the mean and 1 SD above the mean) has been described in Figure 4. The interaction pattern presented in Figure 3 shows that there is little or ignorable difference in IWB by servant leadership for individuals with power distance orientation (1 SD above the mean) and individuals with low power distance orientation (1 SD below the mean). Similarly, the interaction pattern between SL and OCB at different levels of PDO is insignificant and ignorable. These results support H1 and H2 while the there is no support for H2.

Figure 4: Interactive effect of SL and PDO on IWB and OCB
Discussion and Conclusion

Findings of this study support Greenleaf’s premise that servant leadership impact individuals and organization through its focus on serving others. This study supports the role of conservation of resource theory in predicting innovative work behavior suggesting that servant leaders provide their followers the experience of resourcefulness which ultimately leads employees to demonstrate innovative work behavior. Further, servant leader’s tendency to tolerate mistakes and failures of their follower also support employees to demonstrate innovative work behavior as described by Kamaruddin et al. (2015). This research also supports leader-member exchange theory in transmitting the influence of servant leadership on employees demonstrating organizational citizenship behavior that people maintain the norm of reciprocity even in culture with high power distance orientation. Therefore, this study finds support for H1 and H2. Further, these findings are in support of the global expansion of servant leadership practices irrespective of Western or Eastern context (Ertel, 2017). Contrary to expectations, the power distance orientation did not moderate the proposed relationship (H3). Since, high religiosity affects power distance orientation of society (Mathew Sagi, 2019), therefore, the possible reason for servant leadership dominance and ineffective moderation of power distance is apparently the religious orientation of Pakistani society (Hassan, 1987). Since the idea of servant leadership has its roots in religion (Davis & Winn, 2017) and religion is an essential component of social reality and plays an important role in shaping societies, the integration between religion and leadership practices cannot be ignored (Gümüşay, 2019). Therefore, many similarities can be observed between servant leadership practices and religious teachings. However, empirical evidence is required to support this claim. This finding opens endeavors for future research.

Theoretical and Practical Implications

This study implies that servant leadership is an effective leadership approach irrespective of the cultural context and geographic location. Servant leadership functions even under moderate power distance culture where the influence of different leadership practices is attenuated. This study can help the business community in the development of a practical manual to implement servant leadership practices in organizations. This study can also help managers for developing strategies to incorporate servant leadership behavior in their organizations.

Limitations & Future Research

Since the data set used for this research is cross-sectional, no absolute claim can be made with reference to its findings. The longitudinal study in future can help to strengthen the findings of this research. More research on possible moderation of religious orientation in cultures with high or lower power distance orientation can provide great insight with regards to its impact on leadership practices, particularly on character-driven leadership approaches. This can provide empirical support.
to this premise that religious orientation can undermine other cultural moderators such as power distance orientation.

References


EFFECT OF QMS ON INNOVATION AND FINANCIAL PERFORMANCE
A DEVELOPING COUNTRY PERSPECTIVE

Faryal Jalil1, Dr. M. Shafiq2 and Dr. Wasim ul Rehman3

Abstract

This paper aims to examine empirically the influence of QMS implementation on financial performance via innovation in the manufacturing organizations of Pakistan. A questionnaire was developed to collect the data from manufacturing organizations. The Structure Equation Modeling (SEM) was used to examine the hypotheses. The findings suggest that QMS implementation has a significant and positive role in improving innovation and financial performance of the manufacturing organizations. Furthermore, it was revealed that the type and size of the (ISO certified) organization did not influence the organizations’ innovation and financial performance. These results provide support to the policy makers and top management of the organizations to implement QMS in order to achieve higher operational performance.

Keywords: QMS, Innovation, Financial Performance, Manufacturing Organizations.

JEL Classification: E600

Introduction

ISO 9001 is widely accepted quality standard to maintain Quality Management System (QMS) of the organizations. Prior research suggests that QMS (ISO 9001) adopted by organizations to improve performance of the organization. However, the critics of ISO 9001 argues that this it is too bureaucratic in nature and suppress the creativity in the organizations. For example, Kaziliunas (2010)
Our study positively contributes in existing literature in multi-facet ways. First, our study answers the call for additional research on the correlation between QMS (ISO 9001) standard and innovation (Manders et al., 2016; Neyestani & Juanzon, 2017) as the researchers highlight that there is not only a lack of studies on association between QMS and innovation and have also mixed findings. Like, Manders et al. (2016) discovered that many large organizations acquire ISO 9001 to improve product innovation. However, the literature fails to provide clarity whether this standard fosters or hinders product innovation, owing to little scientific discussion. Similarly, Neyestani and Juanzon (2017) concluded that quality standard of ISO 9001 does not correlate significantly with the innovation and learning perspective in organizations. Second, there is lack of research which examined the influence of ISO 9001 implementation on innovation (e.g., Saleem et al., 2011; Fatima, 2014), therefore the underlying study examined the relationship of QMS on financial performance directly and indirectly via innovation. According to Bhatti et al. (2013), innovation management is clearly lacking in developing countries and in this context the current research would reveal critical insights of the relationship between proposed variables. Third, our research answers the call of Manders et al. (2016) to examine the impact of contextual factors like type and size of organization on the relationship between QMS and innovation.

In the light of the aforementioned literature, contradictory results were observed regarding the association among implementation of QMS, financial performance and innovation which needs further investigation. Accordingly, the purpose of this research was to examine the effect of QMS (ISO 9001 certification) on financial performance via innovation. In addition, the impact of contextual factors like the type and the size of organization was also examined on the relationship of proposed variables specially in the context of Pakistan. The results obtained from this study would facilitate the
practitioner to have understanding of, the significance of implementing QMS in innovation activities of organization in an emerging market and its effects on the organizational financial gain.

**Literature Review and Development of Hypotheses**

International Organization for Standardization (ISO) develops the quality standard ISO 9001 as Quality Management System (QMS) in 1987. This standard has been subsequently revised four times.

**QMS and Financial Performance**

There is a stream of research studies that find the association between QMS and financial benefits but the results are still unclear and inconsistent. However a systematic review reveals that significant number of studies claimed the positive effect of QMS on financial performance (Aba et al., 2016; Sharma, 2005; Psomas & Kafetzopoulos, 2014; Zhelyazkov, 2016). For example, Sharma (2005) found improvements in profit margin, growth in sales and earnings per share of organizations after implementing QMS. In the same way, Aba et al. (2016) revealed significant improvement in operating performance measured by dividing EBITA of the firms by total assets in US, after certification. Psomas and Kafetzopoulos (2014) also disclosed positive association between them as they found that the financial and market position of ISO 9001 certified firms are significantly better than non-certified firms. Zhelyazkov (2016) analyzed the finding of the research conducted in last two decades and summarized that the implementation of ISO 9001 helps to enhance the sales and profit of organization in the market. Therefore, the following hypothesis is introduced to examine the association of QMS with financial performance in Pakistan’s manufacturing sector.

**H1:** QMS implementation positively associated with financial performance.

**QMS and Innovation**

Contemporarily, the quality and innovation has gained significant importance and are considered as critical indicators to sustain competitive advantage. Willar et al. (2015) suggested that both quality and innovation are key driving forces to performance. Various researchers even proposed that Quality management is a prerequisite for innovation (Hoang et al., 2006; Naveh & Eraz, 2004). The adoption of quality management contributes to economic-efficiency and innovation enhancement activities, which are important in achieving competitiveness levels (Schuurman, 1997). Moreover, it can help to develop culture and environment that foster innovation. Similarly, according to Naveh and Erez (2004) the implementation of ISO 9001 with other management practices like teamwork, will encourage innovation and adherence to standardization.

Prior literature reveals mixed results related to effects of quality management practices on numerous aspects of organizational performance. The same is true for the direct relationship between
QMS and innovation. Like Kuo et al. (2009) stated that the firms temptation to achieve quick certification without true commitment to quality results, increase the bureaucratic culture, that reduces flexibility and innovation. Al-Refaie et al. (2012) surveyed the association quality standard ISO 9001 and innovation in manufacturing companies of Jordan and found that ISO 9001 does not have positive effect on product innovation performance. Moreover, Pekovic (2010) also found insignificant relationship and recommend that quality management system need to integrate with other organizational practices to give positive improvement in innovation. Whereas some reported significant association also like Kafetzopoulos et al. (2015) conducted survey in food manufacturing sector of Greece and identified a positive influence of QMS on product innovation. Vynarky and Hanley (2015) identified that implementation of ISO 9001 support innovation process in the form of advanced and technological solutions.

Recently, Manders et al. (2016) and Neyestani and Juanzon (2017) explored the correlation between QMS and organizational performance in depth and unearthed that there is lack of studies on innovation. To fill this research gap and to investigate the association of QMS implementation with innovation activities in developing country perspective, following hypothesis is proposed:

\[ H2: \text{QMS implementation positively associated with Innovation.} \]

Innovation and Financial Performance

Today, innovation is considered as one of the important element that help the organizations to gain competitive advantage and economic benefits (Reguia, 2014). Through innovation the firms can respond effectively to the current demand and improve their performance. Earlier the organizations gave more emphasis on quality to enjoy financial benefits, however with the passage of time, the basis of market competition has been shifted from quality to innovation (Hung et al., 2010). Thus, to gain maximum financial benefits organizations needs to adopt both quality and innovation as competitive forces.

Reguia (2014) studied the impact of product innovation on performance and concluded that product innovation brings improvement in productivity, market share, profit margin, effectiveness and efficiency of the organizations. Whereas, process innovation helps to reduce and eliminate errors in process and waste and in turn improve financial performance (Camisón & Puig-Denia, 2016). Contrarily, innovation may not always lead to positive outcomes rather organizations might experience reduced financial performance on account of failed innovative effort (Markham & Griffin, 1998). Literature shows contradictory views regarding any influence of innovation in improving the financial performance. Therefore, it is important to further investigate the relationship between innovation and financial performance. Based on the above discussion, we hypothesize:

\[ H3: \text{Innovation positively associated with financial performance.} \]
Innovation as Mediator

Up-to-date, various empirical studies have examined the direct effect of quality practices on the different perspectives of organizational performance and financial performance. For example Kafetzopoulos et al. (2015) examined manufacturing firms in Greek and found direct influence of QMS implementation on operational performance and indirect influence on business indicators through mediating role of operational performance. Similarly, the results of Islam et al. (2015) supported the results of study of Kafetzopoulos et al., and conclude significant influence of QMS on non-financial performance indicators and insignificant influence on financial performance in Saudi Arabia.

Literature introduced innovation as an operational excellence indicator to gain the competitive advantage. However the prior studies revealed, not only lack of research but also inconclusive findings regarding the QMS implementation in supporting the innovation process in the organizations (Manders et al., 2016; Neyestani & Juanzon, 2017). Therefore, to bridge this gap, it is important to examine the interrelationship between QMS, innovation and financial performance. We thus hypothesize:

**H4:** Innovation mediates the relationship between QMS implementation and financial performance.

Influence of Contextual Factors

The success of quality management system (QMS) implementation, depends on a several contextual factors like sector or organization, size of organization, country, ISO 9001 version, and motivation of the organization (Criado & Calvo-Mora, 2009; Manders et al., 2016; Neyestani & Juanzon, 2017). Literature evidence that the influence of these factors have been rarely examined in empirical studies and conclude inconclusive results, specifically the QMS (ISO 9001) – innovation relationship (Sadikoglu, 2004; Sila, 2007). Manders et al. (2016) calls for research to test the impact of size of firm, nature/type of firm, region, version of standard and organization’ motivation on the association between QMS and innovation. Accordingly, to address these controversies, this research analyzed the influence of size and nature/type of organizations, on the proposed relationship in the context of Pakistan’s manufacturing sector.

Organization Size

A number of studies have different views on how size of company effects implementation of QM and innovation outcomes. For instance, large size organizations have more potential to innovate because they have more resources to invest (Vincent et al., 2004) whereas, the small and medium size firms don’t have enough funds to finance innovation projects, as it is stated by Gunnlaugsdóttir (2002) that the process of acquiring and implementing QMS (ISO 9001) in the organizations, is very costly. In the contradiction of this statement, Mangiarotti and Riillo (2014), discovered high effect of ISO
9001 on innovation in small firms. Whereas, Sila (2007), surprisingly found no effect of firm size on QMS success. Ahire et al. (1996) also found that the size of an organization does not appear to impact its ability to effectively implement TQM. It must be noted that firm size is frequently used as a control variable in studies on innovation. However, the mixed results required more research on this area. Thus, following hypothesis was proposed:

**H5:** The organizations certified to ISO 9001 have significant difference in financial performance on the basis of their firm size.

**H6:** The organizations certified to ISO 9001 have significant difference in innovation performance on the basis of their firm size.

**Organization type**

Industries differ in the nature of production processes. Therefore, the process of innovation may vary in different sectors depending on the access to knowledge, development of technological change rate and connections between organizations. In high technology sectors, the speed of change is rapid whereas it is slow in low and medium technology industries (Manders et al., 2016). The services and manufacturing industries are likely to experience uncommon benefits from QMS. Mangiarotti and Riillo (2014) confirmed that the implementation of QMS has increased technological innovation in manufacturing organizations whereas non-technological innovation has increased in service organizations. Similarly, Criado and Calvo-Mora (2009) outlined the differences in the performance between industrial and service organizations as a result of implementation of quality management practice. The literature suggests that the character of economic sector may influence innovation development (Forsman, 2011).

Jayaram, Ahire, and Dreyfus (2010) attempted to resolve this area and concluded a significant effect of type of industry and firm size in the relationship between QM implementation on final outcomes. Criado and Calvo-Mora (2009) interestingly discover that in industrial organizations the level of engagement from the management is different as compared to service organizations. Hence the quality practices are better in industrial sector than services. This ambiguity leads to propose following hypotheses.

**H7:** The organizations certified to ISO 9001 have significant difference in financial performance on the basis of organization type.

**H8:** The organizations certified to ISO 9001 have significant difference in innovation performance on the basis of organization type.

**Theoretical Framework**

Based on offer mentioned hypothesis following theoretical framework has been proposed.
Research Methodology and Data Analysis

Instrument Design

The self-administered questionnaire was used for collection of data from manufacturing companies. First part was based of personal information of a respondent and organization. Second part was based on the items to measure influence of QMS implementation on the performance variables. The determinants of QMS were based on ISO 9001:2008 and items were adopted from the studies of Arauz and Suzuki (2004) and Singh (2008). The 5 point likert scale from 1 (strongly
disagree) to 5 (strongly agree) was employed to examine the construct QMS (ISO 9001) implementation in the organization.

The items used to measure innovation were based on Product innovation and adopted from Mangiarotti and Riillo (2014). Like number of product increased, level of newness, speed of new product increased etc. The items of financial performance adopted from the study of Han et al. (2007). The 5-point likert scale ranging from 1 (No improvement) to 5 (improvement to a great extent) was used to assess the responses of both innovation and financial performance.

Further the two contextual factors 1) size of organization (measured on the basis of number of employees in the organization) and 2) type of organization (based on the potential industry-type effects).

Sampling

For this study the manufacturing sector was selected as a population. As it is the second highest sector that contributes 13.5 percent to GDP of Pakistan. The data for this study was collected from 379 manufacturing companies which includes food, textile, chemicals, automobile, constructions, electronic, tobacco etc. All of them are listed in Pakistan Stock Exchange. Total 189 companies responded to the survey with response rate 49.86%.

The majority (70.8 %) of the companies were classified as textile, followed by automobile (9.7%), food (8.6 %), chemical and pharmaceuticals (6.5 %) sectors. Moreover, firm size, was measured in terms of number of employees in organization. The scale was divided in to four ranges, from which, majority of the employees falls in range having employees above 1000 (40.9%), followed with, between 200 to 500 (24.7%), between 501 to 1000 (20.5%) and then minimum contribution was from range less than 200 (13.9%).

Measurement Model of QMS

The confirmatory factor analysis (CFA) was used for measurement model. For CFA of the construct SEM was used to establish the validity. The initial measurement model of QMS (ISO 9001), had total 8 constructs comprised of 56 items. According to Bienstock et al. (1997), during CFA the items with factor loading value less than 0.5 can be eliminated and this process of deletion can be continuing, till the one fifth items retained. Thus, by following the process defined by Bienstock et al. (1999) the construct of QMS left with 6 constructs, 29 items and the factor loading values ranging from 0.720 to 0.870 (above 0.5 at p > 0.05). The remaining CFA of the model showed the satisfactory fit model meeting desired values defined by Kline (2016) in table 2 (i.e $\chi^2$/df = 1.76, CFI = 0.93, GFI = 0.81, NFI = 0.85, and TLI = 0.92, RMSEA = 0.06).
Reliability Analysis: It measures the internal consistency of the items. Researchers indicate the value of Cronbach’s Alpha is one of the most frequent method to test the reliability of the instrument and its recommended cut off point is 0.7 (Saunders et al., 2012). The values of Cronbach’s alpha, of all constructs and sub constructs, presented in table 1 are greater than 0.70, thus all the constructs are highly reliable.

Convergent Validity: the composite reliability (CR) and Average Variance Extracted (AVE) were measured to determine the convergent validity. The recommended cut off points for CR and AVE are 0.7 and 0.5 respectively. Table 1 shows that the CR and AVE of all the variables meets the recommended values.

Discriminant Validity: It measures the degree that the concepts are distinct from each other (Bagozzi et al., 1991). Discriminant validity exist if alpha value of a construct is greater than the average correlation of the construct with other variables in model, (Ghiselli et al., 1981). Thus, the positive values in table 1 (column 7), provide the evidence of existence of discriminant validity.

Table 1
Results of Reliability and Validity Test

<table>
<thead>
<tr>
<th>Latent constructs</th>
<th>No of items</th>
<th>Cronbach’s Alpha &gt; 0.7</th>
<th>Composite Reliability CR &gt; 0.7</th>
<th>Average Variance Extracted AVE &gt; 0.5</th>
<th>Average correlation with other variables (alpha - x)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top Management Role</td>
<td>5</td>
<td>0.876</td>
<td>0.877</td>
<td>0.589</td>
<td>0.556</td>
</tr>
<tr>
<td>Customer Focus</td>
<td>3</td>
<td>0.829</td>
<td>0.815</td>
<td>0.627</td>
<td>0.526</td>
</tr>
<tr>
<td>Supplier Management</td>
<td>3</td>
<td>0.816</td>
<td>0.819</td>
<td>0.601</td>
<td>0.542</td>
</tr>
<tr>
<td>Process measurement &amp; Improvement</td>
<td>7</td>
<td>0.909</td>
<td>0.910</td>
<td>0.558</td>
<td>0.716</td>
</tr>
<tr>
<td>Communication</td>
<td>6</td>
<td>0.895</td>
<td>0.896</td>
<td>0.591</td>
<td>0.561</td>
</tr>
<tr>
<td>Resource Management</td>
<td>5</td>
<td>0.908</td>
<td>0.909</td>
<td>0.666</td>
<td>0.842</td>
</tr>
<tr>
<td>Total Items of VMS</td>
<td>29</td>
<td>0.999</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Innovation</td>
<td>4</td>
<td>0.892</td>
<td>0.892</td>
<td>0.68</td>
<td>0.149</td>
</tr>
<tr>
<td>Financial Performance</td>
<td>4</td>
<td>0.881</td>
<td>0.885</td>
<td>0.66</td>
<td>0.149</td>
</tr>
</tbody>
</table>

Structure Path Analysis

Hypotheses of the proposed structure model (Figure 2) were tested by using SEM. According to Kline (2016) the SEM is the more suitable method to examine the relationship among multiple dependent, independent and mediating variables. Table 2 shows that the summary of the goodness of fit indices of different paths. The goodness of fit indices of proposed model, QMS to FP from Innovation were ($\chi^2$/df = 1.711, CFI = 0.912, NFI = 0.814, GFI = 0.776, TLI = 0.905, RMSEA = 0.061) meeting the desired values defined by Kline (2016).
Table 2
Summary of Goodness of fit

<table>
<thead>
<tr>
<th>Model Test</th>
<th>χ²</th>
<th>df</th>
<th>χ²/df</th>
<th>CFI</th>
<th>NFI</th>
<th>IFI</th>
<th>TLI</th>
<th>RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFA of QMS(ISO)</td>
<td>646.92</td>
<td>368</td>
<td>1.758</td>
<td>0.928</td>
<td>0.848</td>
<td>0.813</td>
<td>0.920</td>
<td>0.063</td>
</tr>
<tr>
<td>Direct path from QMS(ISO) to FP</td>
<td>836.563</td>
<td>485</td>
<td>1.725</td>
<td>0.920</td>
<td>0.830</td>
<td>0.792</td>
<td>0.913</td>
<td>0.062</td>
</tr>
<tr>
<td>Direct path from QMS(ISO) to Innovation</td>
<td>839.354</td>
<td>485</td>
<td>1.731</td>
<td>0.920</td>
<td>0.831</td>
<td>0.797</td>
<td>0.913</td>
<td>0.062</td>
</tr>
<tr>
<td>Indirect path from QMS to FP through Innovation</td>
<td>1055.38</td>
<td>617</td>
<td>1.711</td>
<td>0.912</td>
<td>0.814</td>
<td>0.776</td>
<td>0.905</td>
<td>0.061</td>
</tr>
<tr>
<td>Threshold values*</td>
<td>&lt;3</td>
<td>&gt;0.9</td>
<td>&gt;0.9</td>
<td>Close to 1</td>
<td>&gt;0.9</td>
<td>&lt;0.08</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*[(Kline, 2016)]

Figure 2: Structural Model
Hypotheses testing

Table 3 presents the direct and indirect effects of structural model, checked by using SEM.

Direct effect: The regression coefficient between first direct effect showed the significant relation between QMS and financial performance (FP) at unstandardized $\beta = 0.545$ and standardized value of $\beta = 0.470$. This result supported the H1 and indicated the positive influence of quality management system on financial performance. Moreover, the direct effect of ISO on innovation (Innov) was observed significant and positive at unstandardized $\beta = 0.834$ and standardized $\beta = 0.600$. Lastly, the third direct effect of innovation on FP was also found significant and positive with unstandardized $\beta = 0.407$ and standardized $\beta = 0.470$ which supporting the hypothesis H2 and H3 as well.

Indirect effect: The bootstrapping technique at 5000 samples was employed to test the indirect effect among variables. Table 3 presents the indirect effect of path and results of this study showed that the innovation is significantly mediates between ISO 9001 and financial performance with Indirect effect $= 0.279$ (at 95% CI ranging from 0.137 to 0.486, $p < 0.05$). Hence the results support the hypothesis H4. Moreover, it is observed that the direct influence of QMS on FP through mediator innovation, get reduced but remain significant and positive (unstandardized $\beta = 0.233$, standardized $\beta = 0.193$) at $p = 0.031$, less than 0.05. Hence, innovation mediates partially between the relationship of QMS and FP. The results indicated that the implementation of QMS encourage the innovation activities in the organization and hence the organizations enjoy better financial outcomes.

Table 3
Direct Effects of Coefficients of the Hypothesized Model

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Path</th>
<th>Unstandardized Estimate</th>
<th>Standardized Estimate</th>
<th>S. E</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1</td>
<td>ISO $\rightarrow$ FP</td>
<td>0.545</td>
<td>0.470***</td>
<td>0.106</td>
<td>Sig &amp; Accepted</td>
</tr>
<tr>
<td>H2</td>
<td>ISO $\rightarrow$ Innov</td>
<td>0.834</td>
<td>0.600***</td>
<td>0.127</td>
<td>Sig &amp; Accepted</td>
</tr>
<tr>
<td>H3</td>
<td>Innov $\rightarrow$ FP</td>
<td>0.407</td>
<td>0.470***</td>
<td>0.079</td>
<td>Sig &amp; Accepted</td>
</tr>
</tbody>
</table>

Bootstrap Results for Indirect Path

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Path</th>
<th>Unstandardized Estimate</th>
<th>Standardized Estimate</th>
<th>S. E</th>
<th>LL 95%CI</th>
<th>UL 95%CI</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>H4</td>
<td>ISO $\rightarrow$ Innov $\rightarrow$ FP</td>
<td>0.233</td>
<td>0.193*</td>
<td>0.279</td>
<td>0.103</td>
<td>0.137</td>
<td>0.486</td>
</tr>
</tbody>
</table>

***$p < 0.001$, *$p < 0.05$, ISO = QMS (ISO 9000 certification), Innov = Innovation, FP = Financial performance Bootstrap sample size = 2000, LL = lower limit, UL = upper limit, CI = confidence interval
Effects of contextual factors on QMS implementation results

Table 4 shows the analysis of variance between the four different groups and results showed that size of organization has insignificant influence on innovation (ANOVA, \( t = 0.672, p > 0.05 \)) and financial performance (ANOVA, \( t = 0.742, p > 0.05 \)) of the organization. Thus, size of organization does not make difference on the product innovation activities and financial performance of organization.

Table 4
Analysis of difference in mean (size of firm)

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Mean Below 200</th>
<th>Mean 200-500</th>
<th>Mean 501-1000</th>
<th>Mean Above 1000</th>
<th>Levene Test F</th>
<th>Sig</th>
<th>ANOVA T</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>H5: ( \text{OrgSize} \rightarrow \text{Innov} )</td>
<td>3.9931</td>
<td>3.7769</td>
<td>3.8816</td>
<td>3.9011</td>
<td>0.027</td>
<td>0.672</td>
<td>0.570</td>
<td>(ns)</td>
</tr>
<tr>
<td>H6: ( \text{OrgSize} \rightarrow \text{FP} )</td>
<td>4.1575</td>
<td>3.9750</td>
<td>3.9019</td>
<td>4.0292</td>
<td>0.088</td>
<td>0.742</td>
<td>0.528</td>
<td>(ns)</td>
</tr>
</tbody>
</table>

ns = not significant, *** \( p < 0.001 \)
\( \text{OrgSize} = \text{Size of Organization}, \text{Innov} = \text{Innovation}, \text{FP} = \text{Financial performance} \)

Similarly, Table 5 shows insignificant impact of the sectors, on the relationship between QMS implementation, innovation and financial performance. The results found no influence of nature/type of organization on innovation (ANOVA, \( t = 1.399, p > 0.05 \)) and financial performance (ANOVA, \( t = 0.557, p > 0.05 \)) of the organization.

Table 5
Analysis of difference in mean (type of organization)

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Mean Textile</th>
<th>Mean Auto</th>
<th>Mean Food</th>
<th>Mean C&amp;P</th>
<th>Mean Other</th>
<th>Levene Test F</th>
<th>Sig</th>
<th>ANOVA T</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>H7: ( \text{OrgSector} \rightarrow \text{Innov} )</td>
<td>3.860</td>
<td>3.872</td>
<td>3.881</td>
<td>3.766</td>
<td>3.782</td>
<td>0.000</td>
<td>1.000</td>
<td>1.000</td>
<td>(ns)</td>
</tr>
<tr>
<td>H8: ( \text{OrgSector} \rightarrow \text{FP} )</td>
<td>4.062</td>
<td>3.868</td>
<td>3.918</td>
<td>4.046</td>
<td>3.933</td>
<td>0.076</td>
<td>0.548</td>
<td>0.557</td>
<td>0.694 (ns)</td>
</tr>
</tbody>
</table>

ns = not significant, *** \( p < 0.001 \)
\( \text{OrgSector} = \text{nature/type of Organization}, \text{Innov} = \text{Innovation}, \text{FP} = \text{Financial performance}, \text{Auto} = \text{Automobile}, \text{C&P} = \text{Chemical & Pharmaceuticals} \)

Discussion and Conclusion

The primary objective of this paper was to examine empirically how QMS affects financial
performance and innovative activities in the organization. Secondly, to test the mediating role of innovation in understanding the relationship between QMS implementation and financial performance. Moreover, the moderating role of two contextual factors size and type of organization were also examined on the proposed relationships. Previously significant studies have been conducted to explore the relationship that exists between QMS and performance however the literature does not seem to agree upon QMS implementation positively affects financial performance and innovation. Recent literature highlighted that less empirically evidence is available about the relationship between QMS and innovation. Hence, this study aimed;

a) to examine whether QMS implementation facilitate the innovation process or not,
b) the role of innovation as a mediator and
c) the influence of two contextual factors i.e type and size of organization.

The results of this study has confirmed a significant and positive effect of QMS on financial performance. This result is also consistent with studies done in past that claim positive association between them (Sharma, 2005; Psomas & Kafetzopoulos 2014). Further this study also found that QMS (ISO 9001) positively influence the innovation and supported the findings of various previous studies (Vynaryk & Hanley, 2015; Mangiarotti & Riillo, 2014). It means that the implementation of QMS brings significant improvement in the innovation process of manufacturing organizations of Pakistan. Though the innovation process is not a contemporary phenomenon, however, its significance has increased manifold in an era of competitive advantage (Hung et al., 2010). In addition, results about the direct effect of innovation on financial performance was also significant and positive. The result of this relationship is also consistent with the findings of existing literature (Reguia, 2014; Camisón & Puig-Denia, 2016). Then, we found that innovation positively intervene between the relationship of QMS and financial performance of the manufacturing organizations in Pakistan. This suggest that the ISO 9001 certified organizations are more innovation oriented and hence enjoy better financial outcomes. These results strengthen the existing finding in the literature that implementation of QMS stimulates innovation and negate the myth that ISO 9001 standards certification hinders the creativity and innovation in the organizations.

Moreover, it is interesting to note that during the process of measurement model of quality management system, the constructs - teamwork and employee focus were deleted that support the findings of many previous studies (Asif et al., 2013; Shafiq et al., 2014) which provide evidence that QMS (ISO 9001:2008) does not encourage the involvement of the employee. Contrarily in the literature of TQM the employee focus and teamwork are main critical success factors to improve the quality and organizational performance. Therefore, the certified organizations in Pakistan should understand the importance of these constructs as, employees are key stakeholders and by giving them importance it will improve their moral and efficiency, which in turn improves the innovation performance in organization (Sung & Choi, 2014). Similarly, culture of teamwork in an organization ensures collective responsibility and in turn employees come up with new innovative ideas.
Finally, we found that the two contextual factors, size of the organization and type of organization, have no significant impact on the relationship between the QMS and its outcome. These results are in line with the findings obtained in previous studies that showed the firms size has no impact on implementation of QMS (Hashem & Tann, 2007; Vincent et al., 2004). According to Sadikoglu (2004), type of firms and size did not affect the success of quality management system. Similarly, Hashem and Tann (2007) indicated that company size is insignificant predictor for adopting ISO standards. These results also support the arguments that ISO 9001 standard can be practice efficiently in any size and sector of organization (Sila, 2007).

In nutshell, this study concludes that the QMS brings positive improvement in financial performance through innovation as mediator. Moreover, this study also found that the positive effect of QMS on financial performance and innovation is not influenced by the size and type of the organization. Thus, any type and size of manufacturing organization can achieve higher financial and innovation results after implementing QMS. Moreover, it is necessary to outline that in the latest version of ISO 9001 (ISO 9001:2015), the attempt is taken to make QMS less bureaucratic. For example, in the revised version there is no need of mandatory SOP’s which was there in previous versions. This allow the companies to design the QMS documentation as per their own requirement in a flexible way to enhance the innovative activities in the organization.

This study contributes to existing literature of quality management and innovation. From theoretical perspective, the findings of this paper confirm that implementation of QMS system and standards help to enhance innovation activities and financial position of the organization. Moreover, it helps the academician to understand the significance of innovation in the correlation between QMS implementation and financial performance. From practical perspective the results of this study would assist the practitioner to know the status of innovation activities in Pakistan’s certified manufacturing sector, the role of QMS in fostering innovation activities in an emerging market and its effects on the financial performance of organization.

This study also carries certain limitations. For example, in this study, only product innovation was used to measure the innovation performance whereas, the literature identified different types of innovation like process innovation, technology innovation etc. Hence, in future, it is directed to use other types of innovation to have more clarity in understanding the effectiveness of QMS in enhancing innovation. Furthermore, the impact of institutional quality may also be observed as it can improve the innovation capabilities and financial performance in the organization.

References


SOCIAL CAPITAL, HAPPINESS AND ECONOMIC GROWTH: ASIAN EVIDENCE

Sadaf Shahab¹, Muhammad Tariq Mahmood² and Muhammad Hafeez³

Abstract

It is widely accepted that social capital including all of its antecedents affects the economic performance significantly. However, the consensus over the direction of this effect is still missing element of academic research on the issue. This study has contrasted to conventional macroeconomic approach of using social capital variables in a formal growth model and done a refined analysis to evaluate the impact of social and physical capitals on growth, happiness and of growth and happiness on social capital in a panel data analysis of 36 Asian Economies. The present study is addressing the missing element, social capital, in panel of 36 Asian Economies. It estimates the effect of social and physical capital on economic growth, happiness. It also computes the impact of economic growth happiness on social capital. The results imply that growth is subject to both social and physical capital while social capital is mainly talent, innovation and competitiveness driven alongside growth. However, happiness requires something more than growth. The trust, harmony and other factors contribute to social capital and happiness. This paper has implications to future research and the prediction of the discipline and regular pattern of the upcoming social capital in Asian Economies.

Keywords: Social Capital, Well-being, Talent, Competitiveness, Happiness.

JEL Classification: A130, E710

Introduction

Evolution of economy is not a process of financial development isolated from society and not self-sustaining. Wealth creation is not a segregate, but rather depends upon pre-existing socio-cultural conditions for its strength. A crude market structure is based and facilitating environments and is

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linked to agents through multiple inter-connections. The expansion in wealth and markets goad to expand the capacity of the economic agents; which in turn benefits the society. As a result, social classes and new profession emerge; educational attainment and health of general public improve. The emerging communication between the economy and the institutional culture around it accumulates the social capital. Higher social capital accumulation provides higher quality of life for the individuals and their families. This situation also generates migration of individual from low to a higher level of social capital.

The literature defines social capital as; “a form of extensively providing private good that is either open/free or greatly subsidized” (See for example Brown et al., 2006 among others). And Bourdieu (1983) elaborates social capital “as the resources, and services achieved by merely being element of a group, or extensive network by virtue of one’s network location.” This debate further measures the social capital through calculating individuals employed in community-based associations (such as religious or community citizen boards etc.) in a particular geographic vicinity. In socio-economic terms this kind of social capital mechanism is used for resource allocation. However, Bronisz and Heijman (2009) present a precise and relatively undisputed definition stating; “social capital is normally implicit at the same time as the property of a faction rather than the property of an individual.”

Social capital is generally considered as the fourth form of capital, vis-à-vis physical capital, human capital and financial one. Coleman (1998) suggests that like all other forms, it is significant factor of growth: increases the possibility of productive activity. The recent debate in literature also indicates that the social capital and happiness circa has empirical evidence and the predictability of social capital for the happiness hold internationally (Stevenson & Wolfers, 2008; Sacks et al., 2010; Easterlin & Angelescu, 2011; Bartolini & Sarracino, 2009). Particularly, these studies examine the correlation among short, medium and long run time-series of social capital and the welfare. Social capital, unlike pure public structure, is competitively excludable, because it does not freely emit in the public but should be distributed via some method. The aim of this paper is to reconnoiter the relationship between growth, social capital and happiness for a panel of selected Asian economies. The research question can be stated as; “is social capital, like all other forms of capital, an economic concept?”

The rest of the paper is organized as follows; after this brief introduction, section two discusses the theoretical base and the relevant literature on the social capital and economy, section three addresses model and methodological issues; while section four presents results and discussion, section five concludes and proposes some implications.
Theoretical Background and Literature Review

Empirical studies on social capital cover a wide range of social science disciplines, characterize differences in economies in their level of economic and social development to differences in the respective social capital stock. Empirical studies on social capital cover a wide range of social science disciplines, characterize disparities in economies in their stage of economic and social progress to disparities in the respective social capital reserve. Countries or the regions possessing relatively higher stocks of social capital, appear to attain elevated levels of growth, in comparison with the societies having low level of stock among others, see (Brown & Ashman, 1996; Krishna & Uphoff, 1999; Ostrom, 2003; Rose, 2000). Most of such studies agree that social capital adds to scale efficiency and growth by smoothing the process of association between individual interests and achieving the targeted level of income and its fairer distribution.

Social capital also plays a central function for the prediction of international discrepancies in happiness (Bartolini & Sarracino, 2009). Academic literature in this regard tests about the possible correlation between the social capital trends and that of welfare across countries. The studies, in this view, have used an empirical modeling to identify correlation coefficients (see for example, Stevenson & Wolfers, 2008; Sacks et al., 2010; Easterlin et al., 2010; Easterlin & Angelescu, 2011). Particularly, these studies have evaluated the correlation among subjective well-being and social capital in three spans of time-series: long run, medium run and short run.

This particular literature also assesses the correlation coefficient of social capital with GDP. The economic text on happiness has tried to unravel the contradiction by discussing that the dynamic goals of income targeting may counterbalance the positive consequences of rising income on happiness. Such aspirations may also be influenced by the total proceeds of individual’s own relevant income group; for that the rituals, social values, culture and consumption patterns of the society do matter (Duesenberry, 1949), or by their own previous income in the course of hedonic treadmill (Frederick & Loewenstein, 1999). In all cases, economic growth is inclined elevate income targets which put forth negative consequence on happiness4.

However, the usual choice-based criteria cannot elaborate this hypothesis because in preference based system it is assumed that no matter what people choose, makes them happier (Loewenstein, 1994)5. Though other criteria, to base welfare on happiness rather than choices, avoid many such problems but have numerous intrinsic drawbacks. (Frederick & Loewenstein, 1999; Loewenstein & Schkade, 1999; Gilbert et al., 2002). Particularly, people often face to serious health conditions but still exhibit high levels of happiness. However, they agree with others that to healthy is

---

4 This hypothesis can be understood through the modern real business theory, with a leisure-labor paradox.
5 We may call it Benthamite School after the name of Jeremy Bentham.
In line with Putnam (1993) community organizations are sources of common conviction and social ties lead to increased scale efficiency. These diverse views provoked empirical tests intended for a diverse influence on economic growth (Knack 1999; Glaeser et al., 2002). On the whole, Knack (1999) argues that even though every individual calculation of large-scale social capital undergoes a few deficiencies, taken together the body of literature points to a considerable and activist role of social capital for economic growth. And that the influence of social capital is positive: “higher stages of social capital are coupled with succeeding improvements.” Social capital is a contributor to growth by signifying the collaboration and conviction within the firm, the market and the nation.

We can summarize this discussion and frame our study as follow:

(i) The happiness, growth and social capital nexus sometimes exists for some countries over long period of time and for some it does not hold (Stevenson & Wolfers, 2008). In a group of selected panel of Asian economies, this study elaborates the status of relationship between the stated variables.

(ii) Few studies claim that Easterlin paradox (the non-existence of correlation between level of income and happiness) does not hold (for example, Sacks et al., 2010). On the other hand, Easterlin and Angelescu (2011) question about the strength of these inferences stating that these studies failed to differentiate long and short run. In fact, the time perspective is core of the disparity amid Easterlin and others. Easterlin et al. (2010) argues that the significantly positive relation estimated by critics is due to the inclusion of countries in sample with short time series. GDP may matter for welfare in the short run, but such relationships vanish over the long span of time. To answer the questions highlighted by this debate, this study uses a medium term panel data, i.e., five years, and test the existence of horizon randomness.

(iii) The third critical point is raised by Clark and Georgellis (2010), emphasizing that the scholars put much consideration to the relationship between income and well-being. On the
contrary, insufficient efforts are dedicated to investigate, whether or not the social
evaluations are applicable for correlations between happiness and its determinants other than
GDP. For said purpose this paper includes a variable consisting of a combined index of
talent, innovation and competitiveness to test the Clark (2008) hypothesis who explores that
there is (some) evidence of social relations and/or antecedent. However, we are keen to the
notion that whether this “something other than GDP” can do any change in the debate over
the issue. Deaton (2011), on the other hands, finds high correlation between happiness and
stock prices instead of between happiness and income.

**Model and Methodology**

Based on the discussion in the previous section our reduced form model can be summarized
in following system of equations:

\[
G_{it} = \alpha_0 + \alpha_1 S_{it} + \alpha_2 K_{it} + \alpha_3 TIC_{it} + \varepsilon_{1it} \tag{1}
\]

\[
S_{it} = \beta_0 + \beta_1 K_{it} + \beta_2 TIC_{it} + \beta_3 G_{it} + \varepsilon_{2it} \tag{2}
\]

\[
H_{it} = \gamma_0 + \gamma_1 S_{it} + \gamma_2 K_{it} + \gamma_3 TIC_{it} + \gamma_4 G_{it} + \varepsilon_{1it} \tag{3}
\]

Where, \( G \) is growth rate of GDP per capita extracted from WDI; \( S \) is value of social capital
index; \( K \) is physical capital that is gross fixed capital formation as percent of GDP; \( TIC \) is talent,
innovation and competitiveness based combined index. \( H \) stands for happiness. The subscripts \( i \) and \( t \)
denote cross-section and time period respectively. The data used for the purpose of analysis needed
through investigation in collection and measurements. The data on talent are taken from Global
Creativity Index of Martin prosperity Institute: talent is one of the dimensions in this index. Innova-
tion and competitiveness indices are used from Global Competitiveness Forum. These three indices
are combined on the basis of principal component analysis.6

Social Capital data are generated from sustainable society index based on 21 indicators, 7
categories and three dimensions. Based on principal component analysis the three dimensions are
given appropriate weights to generate a comprehensive social capital index (a feature of this paper).
H is the happiness index found in different years’ World Happiness Report (WHR). The sample years
are 2012-2016, while number of countries included in regression analysis is 26 Asian economies.
The selection of countries is based on different criteria; mainly the size of the economy, population and the
availability of the data. Total observations are 130 for panel data. We also present descriptive tables of
cross-sectional data of 136 countries of the world to compare the correlations and statistics of panel
and cross-sectional data.

6 There are different measures of talent, social capital, human wellbeing and happiness found in various studies, [for
example, Broniesz and Heijman (2009), Bartilini et al. (2009), Grootaert and Van Bastelaer (2001), Webster (2013)].
Descriptive and Empirical Analysis

Table 1 and 2 below compare the basic stats of the data. Higher mean and deviation values of Growth, Happiness, Physical Capital and TIC indicate the differences taking place due to time. So we conclude that the time variant property holds for these data, because in the stats of table two the high scoring countries of Europe and North America are also included. The correlation between growth, happiness and TIC are statistically insignificant and are negative. The covariance and correlation between physical capital and growth is theoretical. Happiness is significantly correlated with Physical capital, social capital and TIC. However, highest degree of correlation exists between happiness and social capital.

<table>
<thead>
<tr>
<th></th>
<th>Growth</th>
<th>Happiness</th>
<th>Physical Capital</th>
<th>SC</th>
<th>TIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>4.907</td>
<td>6.483</td>
<td>26.627</td>
<td>5.258</td>
<td>4.351</td>
</tr>
<tr>
<td>Median</td>
<td>5.077</td>
<td>6.409</td>
<td>26.303</td>
<td>5.327</td>
<td>4.283</td>
</tr>
<tr>
<td>Maximum</td>
<td>15.240</td>
<td>8.454</td>
<td>67.984</td>
<td>6.896</td>
<td>5.677</td>
</tr>
<tr>
<td>Minimum</td>
<td>-9.779</td>
<td>4.639</td>
<td>1.524</td>
<td>3.408</td>
<td>2.946</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>2.958</td>
<td>0.780</td>
<td>9.254</td>
<td>0.686</td>
<td>0.646</td>
</tr>
<tr>
<td>Skewness</td>
<td>-0.586</td>
<td>0.479</td>
<td>1.025</td>
<td>-0.447</td>
<td>0.068</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>7.611</td>
<td>3.954</td>
<td>6.927</td>
<td>3.523</td>
<td>2.364</td>
</tr>
<tr>
<td>Jarque-Bera</td>
<td>122.594</td>
<td>9.900</td>
<td>106.281</td>
<td>5.805</td>
<td>2.294</td>
</tr>
<tr>
<td>Probability</td>
<td>0.000</td>
<td>0.007</td>
<td>0.000</td>
<td>0.055</td>
<td>0.318</td>
</tr>
<tr>
<td>Sum</td>
<td>637.854</td>
<td>842.845</td>
<td>3461.528</td>
<td>683.575</td>
<td>565.654</td>
</tr>
<tr>
<td>Sum Sq. Dev.</td>
<td>1129.033</td>
<td>78.384</td>
<td>11047.140</td>
<td>60.750</td>
<td>53.881</td>
</tr>
<tr>
<td>Observations</td>
<td>130</td>
<td>130</td>
<td>130</td>
<td>130</td>
<td>130</td>
</tr>
</tbody>
</table>

The physical capital is included as control variable of the regression and will additionally confirm that whether social capital is also an economic capital. This model is estimated through three different methodologies; namely, Fixed Effects, Random Effects and Generalized Methods of Moments. These approaches are used because all three estimate the panel data under different assumption. Using three methodologies also confirm the robustness of coefficients and stability with regard to previous literature. For brevity and generic nature of these methods we do not discuss the details here.
So in this initial part of analysis we confirm the Easterlin Paradox (discussed in section 2 above). Surprisingly, though statistically significant, but very small magnitude of correlation is observed between Social and Physical capital. The differences in the figures are obvious in panel and cross-sectional data. The lower values of all the correlations indicate that the time variant properties of data hold for panel. In cross-sectional data, the happiness growth correlation is still negative and but highly significant. The correlation between Social capital and growth indicates negative sign and shows that in large cross country data the negative correlation holds between SC and growth. By surprise holding time constant (over the cross-sectional data) the correlation between K and G is negative indicative of the heterogeneity in the cross-sectional units. TIC, SC and H are highly correlated. These results will be important for discussion in empirical section below.

### Table 2

**Descriptive Statistics: Cross-sectional Data (136 countries included)**

<table>
<thead>
<tr>
<th></th>
<th>Growth</th>
<th>Happiness</th>
<th>Physical Capital</th>
<th>SC</th>
<th>TIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>3.520</td>
<td>6.370</td>
<td>16.801</td>
<td>5.324</td>
<td>4.020</td>
</tr>
<tr>
<td>Median</td>
<td>3.606</td>
<td>6.370</td>
<td>17.184</td>
<td>5.252</td>
<td>3.911</td>
</tr>
<tr>
<td>Maximum</td>
<td>9.754</td>
<td>8.964</td>
<td>40.530</td>
<td>7.222</td>
<td>5.252</td>
</tr>
<tr>
<td>Minimum</td>
<td>-2.914</td>
<td>3.883</td>
<td>0.000</td>
<td>3.519</td>
<td>2.888</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>2.293</td>
<td>1.508</td>
<td>6.393</td>
<td>0.853</td>
<td>0.641</td>
</tr>
<tr>
<td>Skewness</td>
<td>0.078</td>
<td>-0.063</td>
<td>0.369</td>
<td>0.238</td>
<td>0.651</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>3.079</td>
<td>1.713</td>
<td>5.159</td>
<td>2.310</td>
<td>3.198</td>
</tr>
<tr>
<td>Jarque-Bera</td>
<td>0.097</td>
<td>5.291</td>
<td>16.492</td>
<td>2.221</td>
<td>5.500</td>
</tr>
<tr>
<td>Probability</td>
<td>0.953</td>
<td>0.071</td>
<td>0.000</td>
<td>0.329</td>
<td>0.064</td>
</tr>
<tr>
<td>Sum</td>
<td>267.490</td>
<td>484.109</td>
<td>1276.887</td>
<td>404.616</td>
<td>305.502</td>
</tr>
<tr>
<td>Sum Sq. Dev.</td>
<td>394.501</td>
<td>484.109</td>
<td>1276.887</td>
<td>404.616</td>
<td>305.502</td>
</tr>
</tbody>
</table>

Table 3

**Covariance Analysis: Panel Data of Asian Economies**

<table>
<thead>
<tr>
<th></th>
<th>G</th>
<th>H</th>
<th>K</th>
<th>SC</th>
<th>TIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth (G)</td>
<td>Covariance</td>
<td>8.684871</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Correlation</td>
<td>1.000000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Covariance</td>
<td>-0.099990</td>
<td>0.602950</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Correlation</td>
<td>-0.043695</td>
<td>1.000000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Happiness (H)</td>
<td>t-Statistic</td>
<td>-0.494829</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Covariance</td>
<td>12.32286</td>
<td>1.544739</td>
<td>84.97797</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Correlation</td>
<td>0.453604</td>
<td>0.215805</td>
<td>1.000000</td>
<td></td>
</tr>
<tr>
<td>Physical Capital (K)</td>
<td>t-Statistic</td>
<td>5.758444</td>
<td>2.500473</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Covariance</td>
<td>0.407199</td>
<td>0.401261</td>
<td>1.375448</td>
<td>0.467307</td>
</tr>
<tr>
<td></td>
<td>Correlation</td>
<td>0.202127</td>
<td>0.755935</td>
<td>0.218268</td>
<td>1.000000</td>
</tr>
<tr>
<td>Social Capital (SC)</td>
<td>t-Statistic</td>
<td>2.335001</td>
<td>13.06420</td>
<td>2.530430</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Covariance</td>
<td>-0.004050</td>
<td>0.336925</td>
<td>1.018819</td>
<td>0.210151</td>
</tr>
<tr>
<td></td>
<td>Correlation</td>
<td>-0.002135</td>
<td>0.673976</td>
<td>0.171671</td>
<td>0.477509</td>
</tr>
<tr>
<td>TIC</td>
<td>t-Statistic</td>
<td>-0.024153</td>
<td>10.32166</td>
<td>1.971500</td>
<td>6.148688</td>
</tr>
</tbody>
</table>

Note: The italic and bold figures are significant statistically.
Empirical Analysis: Results and Discussion

Before estimating the reduced-form model, both parametric and non-parametric panel unit roots tests are employed to test stationarity in the concerning variables of present study (Hafeez et al., 2018). The results are compared in table 4. We can infer that all the series are stationary at level in almost all four cases except social capital. This series is non stationary in IPS test only; otherwise the null of unit root is rejected in rest of the three tests. So our empirical analysis based on the Fixed and random effects is valid for equations 1-3 in section 3 above.

Table 4
Panel Unit Root Tests (Comparison Table)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Test Type (Stats and Level)</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Im, Pasaran &amp; Shin</td>
<td></td>
</tr>
<tr>
<td>Growth</td>
<td>-19.650  l(0)</td>
<td></td>
</tr>
<tr>
<td>Physical Capital</td>
<td>-2.45  l(0)</td>
<td></td>
</tr>
<tr>
<td>Social Capital</td>
<td>-1.51  l(1)</td>
<td></td>
</tr>
<tr>
<td>Happiness</td>
<td>-13.802  l(0)</td>
<td></td>
</tr>
<tr>
<td>TIC</td>
<td>-3.209  l(0)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Levin, Lin &amp; Chu</td>
<td></td>
</tr>
<tr>
<td>Growth</td>
<td>-27.064  l(0)</td>
<td></td>
</tr>
<tr>
<td>Physical Capital</td>
<td>-6.099  l(0)</td>
<td></td>
</tr>
<tr>
<td>Social Capital</td>
<td>-2.345  l(0)</td>
<td></td>
</tr>
<tr>
<td>Happiness</td>
<td>-1.739  l(0)</td>
<td></td>
</tr>
<tr>
<td>TIC</td>
<td>-7.861  l(0)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Phillips-Perron</td>
<td></td>
</tr>
<tr>
<td>Growth</td>
<td>185.83  l(0)</td>
<td></td>
</tr>
<tr>
<td>Physical Capital</td>
<td>81.465  l(0)</td>
<td></td>
</tr>
<tr>
<td>Social Capital</td>
<td>76.457  l(0)</td>
<td></td>
</tr>
<tr>
<td>Happiness</td>
<td>73.263  l(0)</td>
<td></td>
</tr>
<tr>
<td>TIC</td>
<td>99.457 l(0)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hadri</td>
<td></td>
</tr>
<tr>
<td>Growth</td>
<td>6.209  l(0)</td>
<td>l(0)</td>
</tr>
<tr>
<td>Physical Capital</td>
<td>10.56  l(0)</td>
<td>l(0)</td>
</tr>
<tr>
<td>Social Capital</td>
<td>7.797  l(0)</td>
<td>l(0)</td>
</tr>
<tr>
<td>Happiness</td>
<td>8.296  l(0)</td>
<td>l(0)</td>
</tr>
<tr>
<td>TIC</td>
<td>7.124 l(0)</td>
<td>l(0)</td>
</tr>
</tbody>
</table>

We have estimated three equation of the model using three methods. The variations in the results make it of prime interest for sociologists and economists both. The social capital is growth enhancing and any increase in any of the dimension of the social capital statistically leads to growth more than two percent in fixed effects, about one percent over the random effect and about half percent when the moment conditions are applied. This deviation in the results signifies that social capital is more effective along the individual characteristics of the sample countries because fixed effects capture all the effects of geography, endowment and any other factor.

So for Asian economies it is concluded that the individual specific factors of social capital contribute more to growth. The magnitude of physical capital coefficient is relatively consistent for economic growth although has lower level of confidence for fixed and random effects. TIC index does not have statistically significant impact on country level fixed effects but has negative and statistically significant impact on growth if one uses random effects model on these selected Asian economies. It means for the sample economies the spillover effect of talent through human capital on growth is not effective for individual characteristics. However, over the periods, the effect of TIC is growth retarding. The generalized methods of moment results do not differentiate from those of random effects in direction, but different in magnitude. J-stat shows that the restriction employed are valid.
For Social capital, the direction and magnitude of the β coefficients (equation 2) are similar in FE and RE models. So relatively, consistency holds for social capital in both methods, but not for GMM. In GMM model the growth is restrictive to social capital. However, physical capital does not have significant impact on social capital in both methods, but not for GMM. A little evidence of efficacy of K for SC is observed in GMM. TIC contributes positively towards the attainment of social capital of Asian economies. We have found a strong evidence of social capital and happiness relationship, as we presumed in section 2 above in all estimates of the equation 3. Nonetheless the physical capital and growth both have negative and statistically less significant effect on happiness. TIC is effective in generalizing the happiness along with the factors of cross-section and period specific.

Table 5
Empirical Findings

<table>
<thead>
<tr>
<th>Dependent Variables</th>
<th>Growth</th>
<th>Social Capital (SC)</th>
<th>Happiness</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FE</td>
<td>RE</td>
<td>GMM</td>
</tr>
<tr>
<td>C</td>
<td>-11.277</td>
<td>6.816*</td>
<td>1.259</td>
</tr>
<tr>
<td></td>
<td>(-1.2799)</td>
<td>(3.3565)</td>
<td>(0.521)</td>
</tr>
<tr>
<td>Social Capital</td>
<td>2.112**</td>
<td>0.967*</td>
<td>1.75*</td>
</tr>
<tr>
<td></td>
<td>(1.7355)</td>
<td>(3.0105)</td>
<td>(5.14)</td>
</tr>
<tr>
<td>Physical Capital</td>
<td>0.1143**</td>
<td>0.1968**</td>
<td>0.1447*</td>
</tr>
<tr>
<td></td>
<td>(1.7168)</td>
<td>(1.8868)</td>
<td>(7.42)</td>
</tr>
<tr>
<td>TIC</td>
<td>0.467650</td>
<td>-2.812*</td>
<td>-1.43*</td>
</tr>
<tr>
<td></td>
<td>(0.2615)</td>
<td>(-6.4695)</td>
<td>(-5.774)</td>
</tr>
<tr>
<td>Growth</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F-Stat</td>
<td>4.85</td>
<td>3.90</td>
<td>J-Stat: 0.00</td>
</tr>
<tr>
<td>DW</td>
<td>1.80</td>
<td>1.67</td>
<td>1.44</td>
</tr>
<tr>
<td>R²</td>
<td>0.615</td>
<td>0.52</td>
<td>0.339</td>
</tr>
</tbody>
</table>

Note: * and ** indicate statistically significant at 5% and 10% level of significance, respectively. t-stat in the parentheses

Summary and Implications

We can summarize our results in theoretical perspective for policy implication as follows:

i. The growth is capital oriented, whether physical or social. Thus we can answer the question we pondered in section one into Yes. The social capital is like all other economic capital a growth enhancing factor.
In nutshell, we conclude that the Asian economies should emphasize more arguments in their objective function of social welfare, by limiting the role of GDP. The happiness is more than (merely) an income phenomenon.

Reference


Appendix

*List of Asian Economies included in the Sample*

Bangladesh, Bhutan, Cambodia, China, India, Indonesia. Iran, Israel, Japan, Jordon, Korea, Laos, Lebanon, Malaysia, Mongolia, Nepal, Oman, Pakistan, Philippines, Saudi Arabia, Singapore, Thailand, United Arab Emirates, Vietnam, Yemen
MODERATION MEDIATION FRAMEWORK FOR ENTERPRISE RISK MANAGEMENT AND PERFORMANCE OF ISLAMIC BANKS OF PAKISTAN

Waqas Ali¹, Irfan Haider Shakri² and Muhammad Masood Khan³

Abstract

In the present dynamic market, most organization invest in colossal budget to gain a competitive edge and to enhance firm performance. Most of prior researches examined distant determinant of the competitive edge and the firm performance. The ongoing study focused on two components of the business strategy i.e. cost leadership strategy and differentiation strategy and two determinants of firm performance (financial performance and organization learning growth). Furthermore, the core objective of study to inspect the mediation of cost leadership strategy as well as differentiation strategy between Enterprise Risk Management (ERM) practices and Islamic bank performance. Financial literacy plays an intervening role between ERM practices and cost leadership strategy (CLS) and differentiation strategy (DS). Structured questionnaires employed for data collection, from the managers through a convenience sampling method. Structural equation modeling analysis employed to test the hypothesis. Results found positive and significant impact of the ERM practices on Islamic bank performance through cost leadership strategy but insignificant in differentiation strategy. Financial literacy (FL) found a significant negative effect on DS and CLS. This study has some limitations such as convenience sampling method employed for data collection which influence the generalizability of findings.

Keywords: Enterprise Risk Management, Cost Leadership Strategy, Differentiation Strategy, Banks Performance, Financial Literacy.

JEL Classification: G210

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Introduction

ERM has grown since in the 1990s when enterprises face numerous surprises in the competitive environment (Arena, Arnaboldi, & Azzone, 2010). These shocks illustrated that financial crisis worldwide which created importance of the risk management practices (Coskun, 2013). Risk management is an essential concern in challenging worldwide environment. Risk knew to be the prime mover for institutions and individuals (Ali, Lu, & Wang, 2013). In recent years, most of the firm focused management of risk effectively and inefficiently manners (Farooq et al., 2019; Farooq & Raju, 2019). Some researcher believed that ERM practices directly influence on organizational performance (Florio & Leoni, 2017; Zou & Hassan, 2017). Contrarily, some researcher consider some other internal factors that influence the association between ERM and Organizational performance (Khan & Ali, 2017). A plethora of researchers conducted to investigated the importance of ERM practices in business (Bohnert, Gatzert, Hoyt, & Lechner, 2019; Yilmaz & Flouris, 2017).

ERM is a procedure to identify and assess risk which has an impact on the firms’ value. To meet these challenges organization implemented several approaches to manage risk and create fruitful risk management strategy (Meulbroek, 2002). ERM defined as a system to organize, measure, control, monitor and respond to the risk (Farrell & Gallagher, 2015). The leading goal of ERM practices is to augment the value for shareholders (Hoyt & Liebenberg, 2011). Furthermore, risk management enhances profitability and revenue for the organization. Islamic banks comparatively pay not much attention to Enterprise risk management practices. Moreover, few studies conducted on Erm and performance of the organization in under developing economies. None of the studies conducted before to determined ERM practices of Islamic banks of Pakistan.

ERM plays a very significant role in every day organizational practices as well as business activities to help businesses to control and manage their internal system. ERM practices crucial to respond any business threat in the better way and ensure getting benefits from the opportunities which are also helpful for organization to gain the competitive advantage (Armeanu, Vintilă, Gherghina, & Petrache, 2017). Enterprise risk management is very crucial for top management to effectively manage several kinds of risks (Annamalah, Raman, Marthandan, & Logeswaran, 2018).

According to the governor of state bank of Pakistan, Islamic bank should need to enhance risk management practices and transparency which can help to immunized from the risk (Bajwa, 2018). So, it is necessary to determine the impact of the ERM practices on the Islamic bank’s performance in Pakistan.

The novelty of this paper is previous studies utilized competitive advantage as the whole mediation variable between ERM on the firm performance. This paper examined two main compo-
nents of competitive advantage the first component is differentiation strategy and the second component is cost leadership strategy separately. Moreover, there is no study conducted before to examine the firm performance of Islamic banks of Azad Kashmir. Additionally, this research further contributes to the literature section. This study beneficial for the bank’s manager and owner to focused on ERM practices as well as financial literacy and components of competitive advantage.

The fundamental goal of present study investigates the impact of the ERM practices on the Islamic bank performance through mediating role of differentiation and cost leadership strategy, financial literacy recompense moderating role in current framework.

**Literature Review**

**ERM and banks performance**

In today’s worldwide businesses risk management is a fundamental concern for any business (Gordon, Loeb, & Tseng, 2009). Aabo, Fraser, and Simkins (2005) risk can turn into a great occasion if the deal in efficient manners. business enterprise risk management has same meanings as in strategic risk management, holistic risk management, integrated risk management, corporate risk management, business risk management and the broad ERM (Manab, Kassim, & Hussin, 2010). ERM is an efficient and competent instrument which different organization is using to reduce risks (Culp, 2002). ERM not only enhances the financial performance of the organization but also reduce associated risks (Florio & Leoni, 2017). There is some evidence available in real life; ERM relies on the competitive edge (Stulz, 1996). There is dearth studies conducted about the impact of ERM practices on the performance of firm (Khan & Ali, 2017).

Silva, Silva, and Chan (2019) conducted a study to testify the association between the ERM and the firm value. Study found ERM practices has positive and significant link with firm value. The study found a significant association between ERM practices and SME performance in the presence of competitive edge as mediation and financial literacy as moderator variable (Yang, Ishtiaq, & Anwar, 2018). Furthermore, the study illustrated that enterprise risk management has an association with firm performance with interaction impact of intellectual capital (Khan, Ali, Anjum, & Noman, 2019). They also suggested enterprise risk management implementation has positively associated with firm performance in Italian organizations (Florio & Leoni, 2017). Battaglia, Fiordelisi, and Ricci (2016) found that ERM has positive and significantly reduce risk and increase risk-adjusted performance during the financial crisis in eastern Europe. Undoubtedly there is a notable link between the ERM practices and the Performance of firm (Callahan & Soileau, 2017; Zou & Hassan, 2017). Contrarily, Eikenhout (2015) evaluated a study in Dutch insurance companies and found no remarkable link between ERM and the firm performance. Moreover, the study also did not find any impact of ERM on organization performance (Şenol & Karaca, 2017). Following hypothesis formulated based on above discussion.

**H1**: There is a positive influence of ERM practices on Islamic bank performance.
ERM and Cost Leadership Strategy

Business strategies outlined with purpose of internal as well as external valuation of the company. The enterprises can get a competitive advantage based on different strategies. These strategies includes CLS, DS and the FS (Porter, 1980). The current study focused on two competitive advantage strategies (CLS and DS). CLS accentuates for those customers satisfaction who are seeking low-cost product. This strategy divided into segments. First, Products or services offered to the customer at the minimum price available in the market. On the other hand, the second segment is the best product or services offered to the customers at the best available price in the market.

According to Brustbauer (2016), ERM practices significantly influence on strategic decisions which leads to organizational performance. Diversely, ERM practices don not influence directly on the organization’s value, but some internal factors influence on the relationship (Chang, Yu, & Hung, 2015). According to Zou and Hassan (2017) ERM practices helpful for curtail of different associated costs (cash flow management, asset management, and inventory management). Reduction of all cost leads to enhance the organization’s performance (Zou & Hassan, 2017). The study found that the positive link between the ERM practices and cost leadership strategy and differentiation (Soltanizadeh, Abdul Rasid, Mottaghi Golshan, & Wan Ismail, 2016)

H2: There is a positive influence of ERM practices on the cost leadership strategy.

Cost Leadership Strategy and Organization Performance

Frimgo and Anderson (2012) explained three major components of COSO’s enterprise risk management definition which is akin to the strategy. The first component of ERM must be linked with the strategy of the company effectively. Second, ERM designed to identify the circumstances which influence the performance of the company. Conclusively, ERM and strategies should be parallel. This is exactly strategic risk management come in. Third, the aim of ERM is to provide an assertion that the firm accomplishes its goal. According to Soltanizadeh et al. (2016) found a significant association between the CLS and the firm performance of listed companies in Malaysia. Furthermore, the study found a positive association between organizational performance and CLS in the hotel industry of Malaysia (Hilman & Kaliappen, 2014). Additionally, the study found that positive effect of the CLS and performance of Kenyan manufacturing firms (Wamalwa, 2018).

Contrarily, the study found there was no link between differentiation and cost leadership strategy with organization performance (Nandakumar, Ghotibian, & O'Regan, 2011). Moreover, the study also revealed that cost leadership strategy and the differentiation has no association found with the firm performance of Thailand manufacturing firms (Seedee, Sulaiman, & Ismail, 2009).

H3: There is a positive effect of the cost leadership strategy on the Islamic bank performance.
ERM and differentiation strategy

Differentiation is Porter (1980) strategy which accentuates offering inimitable product or services at a relative price to the customers. Enterprise risk management system imperative for decision making and controlling. ERM practices not only crucial for the financial performance but also essential for the non-financial performance of the organization (Zaleha Abdul Rasid, Ruhana Isa, & Khairuzzaman Wan Ismail, 2014). It is asserted execution of ERM practices to organization successfully can lead to success. ERM practices helps to curtail operational cost and accounting cost. Conclusively, Organization executes a distant process to achieve competitive advantage. In this process, ERM practices utilized for shrinkage of different associated risks and expedited a firm’s competitive advantage satisfactory (Elahi, 2013). Following hypothesis formulated based on above discussion.

H4: There is a positive impact of ERM practices and the differentiation strategy.

Differentiation Strategy and Organizational Performance

Cost leadership strategy executes at the lower level organization and differentiation strategy performed at the higher level company (Kim, Nam, & Stimpert, 2004). Kumar, Subramanian, and Strandholm (2002) identified that hospital utilized a differentiation strategy and have a stronger market inclination as compared to the CLS. Market orientation leads to differentiation performance as compared to cost leadership. Furthermore, Spencer, Joiner, and Salmon (2009) determine the positive link between the determinant of DS (product flexibility and customer service) and the performance of the firm. Wamalwa (2018) examined the positive impact of differentiation on the performance of Kenyan manufacturing companies.

Gorondutse and Hilman (2017) stated that positive and significant link of the DS and performance of Nigerian hotel industry. Additionally, they found the environmental munificence recompense moderating role between the link of DS and the firm performance. One more study testified positive link between differentiation strategy and the performance of Kenyan hotels (Bukirwa & KISING’U, 2017). Contrarily, Aliqah (2012) found DS does not influence on the performance of Jordanian companies.

H5: There is a positive effect of differentiation strategy on Islamic banks performance.

ERM and Financial Literacy

ERM practices not always provide a competitive edge but also need some skills which help to achieve the firm’s objective (Arena et al., 2010). Well educated managers as well as directors of the firm motivated to engage in the risk reduction activities which include corporates financial policies and hedging (Dionne & Triki, 2005). According to bank association of South Africa characterize financial literacy of SMEs must have the following requirement. This qualification includes business
management skills, specific entrepreneurial competencies level, personal skills, and financial requirements and regulatory issues (Messy & Monticone, 2012). The study examined the significant association between financial literacy and ERM practices (Yang et al., 2018). Additionally, authors confirmed that qualification of managers has an impact on ERM practices and the strategies of the firm (Shanahan & McParlane, 2005). Financial education of entrepreneurs is also influenced by the association between firm performance and ERM (Herbane, 2010). Following hypothesis formulated based on above discussion.

**H6:** There is a significant effect of financial literacy on the relationship between enterprise risk management practices and cost leader strategies and differentiation strategy.

![Conceptual Framework](image)

**Methodology**

Data collected from structured questionnaires distributed among operational managers and branch managers of Islamic banks of Pakistan. This study is quantitative in nature, and the cross-sectional method is employed.

**Population and sample size**

The population of the current study is the managers of Islamic banks of Pakistan. Data was collected through a convenience sampling method. Questionnaires distributed among 150 operational managers and branch manager and 122 returned 118 questionnaires filled suitable.
Measurement of enterprise risk management practices nine items adopted from (Embi & Shafii, 2018). Six items adopted from (Wamalwa, 2018) developed by (Dess & Davis, 1984) to measure cost leadership strategy (Efficiency, the economy of scale and supplier relation) and differentiation strategy (customer services, marketing activities and product development). Ten items adopted from (Kaplan & Norton, 1992) study to measure Islamic banks performance (financial performance and organizational learning growth). Seven items adopted from (Okello Candiya Bongomin, Mpeera Ntayi, Munene, & Akol Malinga, 2017) study to measure financial literacy.

Analytical tool

Structural equation modeling utilized for testing of hypothesis by using SmartPLS V.3.2.8, data analysis divided into parts. In the first phase, initial data screening processed and employ CFA to check the fitness of model, reliability and discriminant validity. In the second phase, structural equation modeling employed to check the influence of enterprise risk management practices on Islamic banks performance.

Results and Discussion

Respondents of current study are the branch manager and operational manager of the Islamic banks in Pakistan. Three are approximately 102(86%) respondent was male and 16(13.6%) participants were females. There are approximately 60(50.8%) were branch manager and 58(49.2%) were operational manager participated in this survey.

Instrumental scale

Figure 2: Structural Model
The above Figure 2 illustrates the testing of the model. According to different authors value of outer loading should >0.50, 0.60 and >0.70 (Hair, 2006). In the present study followed >0.70 outer loading threshold criteria, those items <0.70 were omitted. All those items less than the cut of the point has an effect on composite reliability (CR), Rho-A, Cronbach alpha and Average Variance Extracted (AVE). Result testified that all outer loadings >0.70 (Ramayah, Cheah, Chuah, Ting, & Memon, 2016).

![Figure 2: Structural Model](image)

**Figure 3: Structural Moderation Model**

This above figure 3 shows that the moderation effect of financial literacy on cost leadership strategy and the differentiation strategy. Results reveal that significant effect of financial literacy on the cost leadership strategy as well as differentiation strategy.

Table 1

<table>
<thead>
<tr>
<th>Items</th>
<th>Loading of items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enterprise Risk Management 2</td>
<td>0.781</td>
</tr>
<tr>
<td>Enterprise Risk Management 3</td>
<td>0.812</td>
</tr>
<tr>
<td>Enterprise Risk Management 5</td>
<td>0.812</td>
</tr>
<tr>
<td>Enterprise Risk Management 6</td>
<td>0.832</td>
</tr>
<tr>
<td>Cost Leadership Strategy 1</td>
<td>0.804</td>
</tr>
<tr>
<td>Cost Leadership Strategy 2</td>
<td>0.724</td>
</tr>
</tbody>
</table>

(Table Continued....)
The above table 1 shows that outer loading of each item in the construct. The value <0.70 omitted for better results and avert convergent as well as discriminant validity. Findings demonstrate that all outer loadings >0.70.

Table 2
Reliability and validity of the construct

<table>
<thead>
<tr>
<th>Variable</th>
<th>Cronbach's Alpha</th>
<th>Rho A</th>
<th>Composite Reliability</th>
<th>Average Variance Extracted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enterprise Risk Management</td>
<td>0.826</td>
<td>0.832</td>
<td>0.884</td>
<td>0.656</td>
</tr>
<tr>
<td>Cost Leadership Strategy</td>
<td>0.855</td>
<td>0.871</td>
<td>0.895</td>
<td>0.630</td>
</tr>
<tr>
<td>Differentiation Strategy</td>
<td>0.838</td>
<td>0.846</td>
<td>0.892</td>
<td>0.675</td>
</tr>
<tr>
<td>Islamic Bank Performance</td>
<td>0.874</td>
<td>0.879</td>
<td>0.905</td>
<td>0.613</td>
</tr>
<tr>
<td>Financial Literacy</td>
<td>0.842</td>
<td>0.849</td>
<td>0.888</td>
<td>0.613</td>
</tr>
</tbody>
</table>
The above table 2 revealed that value of Cronbach’s alpha > 0.70 acceptable (Nunnally, 1978), the value of Composite reliability >0.50 is acceptable and value of average variance extracted is >0.70 (Hair, Black, Babin, Anderson, & Tatham, 2006). Results indicate that enterprise risk management practices, cost leadership strategy, differentiation strategy, financial literacy, and Islamic bank performance meet the condition of the threshold.

Table 3  
*Fornell-Larcker Criterion*

<table>
<thead>
<tr>
<th></th>
<th>Cost Leadership Strategy (1)</th>
<th>Differentiation Strategy (2)</th>
<th>ERM Practices (3)</th>
<th>Banks Performance (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>0.794</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2)</td>
<td>0.618</td>
<td>0.822</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(3)</td>
<td>0.636</td>
<td>0.431</td>
<td>0.810</td>
<td></td>
</tr>
<tr>
<td>(4)</td>
<td>0.709</td>
<td>0.487</td>
<td>0.638</td>
<td>0.783</td>
</tr>
</tbody>
</table>

The above table 3 testified that there is no discriminant validity issue. All diagonal value > from the correlation of each variable (Fornell & Larcker, 1981). Diagonal value of each construct is the square root of Average Variance Extracted (AVE), and it should be greater than the correlation value of each construct.

Table 4  
*Heterotrait-Monotrait Ratio*

<table>
<thead>
<tr>
<th></th>
<th>Cost Leadership Strategy (1)</th>
<th>Differentiation Strategy (2)</th>
<th>ERM Practices (3)</th>
<th>Banks Performance (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2)</td>
<td>0.740</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(3)</td>
<td>0.712</td>
<td>0.502</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(4)</td>
<td>0.799</td>
<td>0.571</td>
<td>0.739</td>
<td></td>
</tr>
</tbody>
</table>

The above table 4 illustrates that the modern method to the assessment of the discriminant validity. There is a lack of discriminant validity when value close to 1. According to Kline (2015), value >0.85 shows lack of discriminant validity. Moreover, value >0.90 illustrates a lack of discriminant validity (Gold, Malhotra, & Segars, 2001). Results found that there is no validity issue in the framework.
The above table 5 shows the effect of endogenous and exogenous variables. Results indicate that there is positive and significant impact of CLS on performance of Islamic banks ($\beta$=0.474, p<0.05), no impact found of differentiation strategy on performance of Islamic bank ($\beta$=0.060, p>0.05), positive effect of ERM practices on cost leadership strategy ($\beta$=0.636, p<0.05), positive impact of ERM practices on differentiation strategy ($\beta$=0.431, p<0.05), ERM practices have a positive effect on the performance of Islamic banks ($\beta$=0.311, p<0.05). financial literacy has an insignificant effect on cost leadership strategy ($\beta$=0.177, p>0.05), financial literacy has an insignificant effect on differentiation strategy ($\beta$=0.070, p<0.05). there is a negative and significant moderation effect found with CLS and the DS.
The above table 6 shows that the specific effect of ERM practices on Islamic bank performance through the mediating role of cost leadership strategy and differentiation strategy. The study found that there is a positive effect of ERM practices on Islamic bank performance through the mediating role of cost leadership strategy. Contrarily, there is an insignificant effect of ERM practices on Islamic bank performance in the presence of the differentiation strategy.

**Conclusion**

The core objective of current study to investigate the influence of enterprise risk management practices on the Islamic bank performance in Pakistan. Differentiation strategy and cost leadership strategy play a mediating role. The study concluded that the enterprise risk management practices has a positive and significant effect on the financial as well as non-financial performance of Islamic banks. Results also concluded that there is significant effect of ERM practices on Islamic bank performance in the presence of cost leadership strategy.

The result of present study found that there is an insignificant effect of ERM practices on Islamic bank performance through the mediating role of differentiation strategy. Financial literacy found a positive effect on Islamic bank performance. This present study found that there is an insignificant moderating effect of FL on DS and the CLS. This study recommended that the Islamic bank should focus on cost leadership strategy to enhance the financial and non-financial performance of Islamic banks. Enterprise risk management practices also help to enhanced banks performance.

This study prone some limitation such as data collected from 118 managers from different Islamic banks through convenience sampling method. This is a cross-sectional study which may affect generalizability. Future study can take other components of competitive advantage.
References


DETERMINANTS OF HOUSEHOLD’S PREFERENCES FOR SAFE DRINKING WATER IN PAKISTAN

Naeem Akram\(^1\) and Abdul Khaliq\(^2\)

Abstract

The availability of clean drinking water is referred as one of the basic human right, due to the fact that drinking of unsafe water results in various waterborne diseases especially diarrhea and hepatitis. Past studies indicate that most of the children (below the age of 3) in Pakistan suffer from four episodes of diarrhea and usage of safe drinking water has potential to significantly improve the situation. In the present study socio economic factors in determining the Pakistani household’s decision for drinking water sources and adoption of water purifying methods at home have been analyzed. Study estimated the Multinomial logit (MNL) models on household data of Pakistan Demographic and Health Survey 2012-13. Study found that having small family, living in urban areas, being wealthy, being educated, having media exposure, less distance from water source, faced diarrhea by any family member in last four weeks and women empowerment are significant factors in utilization of safe or better quality drinking water in Pakistan.

Keywords: Safe Drinking water, Women Empowerment, Education, Awareness.

JEL Classification: D310, J160

Introduction

Inadequate and poor quality of drinking water is major health issue among developing countries. Because numerous deadly diseases particularly hepatitis and diarrhea are connected with drinking water’s quality. According to WHO (2004) estimates approximately 1.8 million people dies every year due to diarrhea and majority of them (90%) are children. It was further concluded by the study that poor quality of water and sanitation is the major reason for 88% of these fatal diarrhea illness. In view of that access to safe drinking water is acknowledged as basic human right (Jain, 2012).

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Note: The views presented in the paper are author’s personal views and do not represent views of their affiliated institutions in any respect.
Improving the quality of drinking water will result in curtailing the water borne diseases and diarrhea (Fewtrell et al., 2005; Esrey et al., 1991; Esrey & Habicht, 1986). It has been found that during 1870-1930, by providing piped water to the urban areas, mortality rates had declined rapidly in USA (Cutler & Miller, 2005). However, such benefits can only be achieved if good sanitation facilities and hygienic condition are available (Brick et al., 2004 & Checkley et al., 2004).

The situation of access to safe drinking water in developing countries is unsatisfactory. According to the estimates of UNICEF and WHO, almost 780 million people of the planet are lacking access to safe drinking water (WHO/UNICEF JMP 2012). In Pakistan, Nils (2005) estimated that approximately 2 lac children die annually due to the diarrhea. It has also been concluded that due to human waste and contamination of industrial and agricultural pollutants water’s quality in Pakistan has significantly deteriorated over the years and polluted water is the main reason of 60% of infectious waterborne diseases (PCRWR, 2012). The study also concluded that in different urban areas of Pakistan, due to closeness with sewerage lines the piped water is also polluted.

In Pakistan, people drink water from various sources including, piped water, hand-pumps, wells, tube wells, bottled water, ponds, fountains and rivers etc. Past studies on the issue indicates that household’s decision to choose the source of drinking water is significantly affected by wealth of household head, education and level of awareness about hazards of using unsafe water by the household head, household distance from water source, size of the family, quality of the water (taste, odour etc.) and locality of household living in urban or rural areas (Haq et al., 2007; Rauf et al., 2015; Abrahms et al., 2000; Zulifqar et al., 2016).

In order to purify water at home, people adopt different methodologies like filters, use of charcoal and boiling etc. Past studies on the subject found that cost of methods adopted to clean water, wealth of household head, education and level of knowledge about hazards of using unsafe water of household head plays significant role in selection of in-house water purifying methods (Bruce & Gnedenko 1998; Smith & Desvousges 1986; Jalan & Somanathan 2008; Quick et al., 1999; Mintz et al., 2001; Jalan et al., 2009). It was also concluded that wealthier and well educated household prefer to use comparatively expensive technologies (filters) for water purification (McConnell & Rosado 2000; Dasgupta, 2001) However, it was argued that in comparison to education and awareness, wealth of household plays stronger role in decision making of adoption of water purification techniques (Jyotsna et al., 2003). It has also been concluded that households wherein female members are well educated tends to pay more for safe drinking water (Sattar & Ahmad, 2007).

In the present study drinking water sources and adoption of different water purifying techniques by Pakistani households will be analyzed. Study will also attempt to explore the role of different socio economic factors on the decision for using safe drinking water in Pakistan.
Methodology

Pakistan Demographic and Health Survey (PDHS) 2012-13 dataset have been used in the study. Over the years Demographic and Health surveys are conducted with the funding and assistance from USAID. A total of 12,943 households were interviewed in PDHS 2012-13.

As mentioned in introduction a household can get the safe drinking water by having access or using the treated water supplied by government/NGO/purchasing or household may treat the water at home. Checkley et al. (2004) and Brick et al. (2004) concluded there are likelihood that during storage and transportation of clean drinking water to the households’ significant contamination can occur which deteriorates the water’s quality. Therefore applying method to purify water at the time and point of its use is the more effective as compared to supplying/obtaining the treated water (Fewtrell et al., 2005). Colwell et al. (2003) found that in Bangladesh, very simple methods i.e. using old saris as water filter had successfully removed the harmful particulates (larger than 20 micron) from water, reducing the diarrhea by 45%, yet it failed to remove the bacteria. However if water is treated by boiling or using chemicals then bacteria can easily be eliminated (Mintz 1995; Quick et al., 1999).

The PDHS 2012-13 provide the data of household’s drinking water sources and purifying methods adopted by them to make drinking water safe. In order to analyze the household’s choice of the source of drinking water a Multinomial Logit (MNL) model has been estimated because dependent variables are multi-categories and they do not have any ranking or ordering. In the model base category is filtered/ bottled water.

Another multinomial logit model will be estimated to examine the household’s preferences for water purifying methods and here no treatment will be used as base category. The independent variables of the analysis are household’s income, education of household head, distance/time to reach water source, level of awareness of household head (proxied by Listening Radio, Watching TV, or Reading Newspaper), family size, household head’s gender, family member facing diarrhea during last month, empowerment of women in the household and region (urban or rural).

Results and Analysis

In table 1, descriptive statistics of the explanatory variables have been presented. It suggests that approximately 46% of the households belong to urban areas, while majority are rural households i.e. 56%.
Table 1
*Descriptive statistics of independent variables*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Average</th>
<th>Standard Deviation</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Region (Rural=0, Urban=1)</td>
<td>0.4653</td>
<td>0.4981</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Household Head’s Sex (Female =0, Male=1)</td>
<td>0.9142</td>
<td>0.2804</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Household Head’s age</td>
<td>46.6790</td>
<td>13.4142</td>
<td>14</td>
<td>95</td>
</tr>
<tr>
<td>Family Size</td>
<td>8.9082</td>
<td>5.1041</td>
<td>1</td>
<td>48</td>
</tr>
<tr>
<td>Education of Household Head</td>
<td>1.4290</td>
<td>1.1563</td>
<td>0</td>
<td>3 (High)</td>
</tr>
<tr>
<td>Wealth</td>
<td>3.0382</td>
<td>1.4234</td>
<td>1 (Top 20%)</td>
<td>5 (Bottom 20%)</td>
</tr>
<tr>
<td>Awareness (Listening Radio, Watching TV, or Reading Newspaper =1, 0 otherwise)</td>
<td>0.5063</td>
<td>0.4991</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Distance to water source (Time to reach water source 15 minutes or more=1, 0 otherwise)</td>
<td>0.1744</td>
<td>0.3793</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Women’s Empowerment in purchasing Household items (Empowerment=1, 0 otherwise)</td>
<td>0.4031</td>
<td>0.4914</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Incidence of Diarrhea (Diarrhea during last month=1, 0 otherwise)</td>
<td>0.1490</td>
<td>0.3561</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>
Table also depicts that most of the households are headed by male (91%). Similarly, maximum age of the household head in the survey is 95 years while minimum age was 14 years, table also indicate that average age of the household head is 47 years. The maximum family size of the surveyed households is found to be 48 people. However, on average a family consists of 9 persons. It also suggests that approximately 50% of the households are either listening to radio or watching TV or they are reading newspapers, reflecting reasonable level of awareness. The table indicates that limited 17% of households are living in a place from where it took fifteen minutes or more to reach the water source. In 40% of the household’s women enjoys autonomy in decision making for purchasing households items.

It is pertinent to mention here that in the survey seventeen different drinking water sources have been reported. Keeping in view the number of responses and nature of the sources they are clubbed into six water sources. Considering the bottled water and water obtained from filtration plant as the safe drinking water, in the first estimated model (Multinomial logit model) it is used as base category of water source.

Table 2
Estimation results (Drinking water source)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Piped Water</th>
<th>Protected well/ bore hole / Tube well</th>
<th>Springs/ unprotected well</th>
<th>Streams/ River/ Cannels/ Lakes Dam/ Ponds</th>
<th>Carats/ Truck/Tanker</th>
</tr>
</thead>
<tbody>
<tr>
<td>Region</td>
<td>0.3914*</td>
<td>-1.0391*</td>
<td>-1.3610*</td>
<td>-0.6483*</td>
<td>0.1692</td>
</tr>
<tr>
<td>Household Head’s sex</td>
<td>0.1630</td>
<td>-0.1123</td>
<td>-0.8861*</td>
<td>-0.8162*</td>
<td>-0.7874</td>
</tr>
<tr>
<td>Household Head’s age</td>
<td>-0.0011</td>
<td>-0.0060</td>
<td>-0.0012</td>
<td>-0.0114</td>
<td>-0.0113**</td>
</tr>
<tr>
<td>Family Size</td>
<td>0.0330*</td>
<td>0.0532*</td>
<td>0.6024*</td>
<td>-0.0713*</td>
<td>0.1021*</td>
</tr>
<tr>
<td>Education of the household head</td>
<td>-0.6481**</td>
<td>-0.0150</td>
<td>-0.0092**</td>
<td>-0.0914**</td>
<td>-0.1230**</td>
</tr>
<tr>
<td>Wealth of household</td>
<td>-0.7551*</td>
<td>-0.8910*</td>
<td>-1.4090*</td>
<td>-1.5513*</td>
<td>-1.1091*</td>
</tr>
<tr>
<td>Awareness (Media exposure)</td>
<td>-0.2623**</td>
<td>-0.3624*</td>
<td>-1.0664*</td>
<td>-0.6131*</td>
<td>-0.7983*</td>
</tr>
<tr>
<td>Distance to water source</td>
<td>3.2342*</td>
<td>2.3242*</td>
<td>-1.7273*</td>
<td>-0.6903*</td>
<td>-0.8161*</td>
</tr>
<tr>
<td>Women’s Empowerment</td>
<td>-0.1143</td>
<td>-0.1311</td>
<td>-0.5304*</td>
<td>-0.8490*</td>
<td>-0.4272*</td>
</tr>
<tr>
<td>Constant</td>
<td>-2.2730*</td>
<td>4.3542*</td>
<td>4.7984*</td>
<td>4.0030*</td>
<td>2.0391*</td>
</tr>
<tr>
<td>LR Chi Square</td>
<td>5222.280*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p < 0.05;  **p < 0.10
The results suggest that place of residence (living in urban or rural areas) have significant impact on the choice of drinking water source in four out of 5 alternative sources. It indicate that there are significantly more likelihood that households belonging to urban areas will use piped water in comparison to bottled or filtered water (cost seems to be major reason). However, there are significant less likelihood that urban households will use the water from rivers, streams, tube wells, and wells for drinking purposes.

It has also been found that in two alternatives the household head’s sex had played significant role, suggesting that there is less likelihood of using drinking water from unprotected wells, springs, streams, rivers and dams by the households that are headed by male. However, the household head’s age failed to exhibit any significant role in determining the drinking water source.

The family size emerged as strong determinant of household’s decision of using drinking water source because of the significant results for all the alternatives. It has been found that in four alternatives households having large family size prefers these sources over bottled water or water from filtration plants. Due to the fact that with large family size the requirement of drinking water also increases so using bottled water or water from filtration plant become unaffordable. However, even the households having large family size do not like to use drinking water from dams, river and streams.

Similarly, the education and awareness (media exposure) have significant role in household’s decision to choose from alternative water sources. It has been found that well educated and having media exposure households do not (significantly) prefer to use water from different sources over bottled water/water from filtration plants. It reflect that with education and media exposure household that are aware about the hazardous impacts of using unsafe water prefer safe drinking water sources.

Study also found that wealthier households significantly prefer to use bottled and filtered water over different other alternative sources. Because wealthier households had affordability of high cost of bottled water, furthermore they are also more health cognizant and are ready to make extra expenditure on safe drinking water sources.

Distance to water source also play significant role in household’s choice of the drinking water source. It reveals that likelihood of using drinking water from protected wells, piped water and tankers significantly increases if it took fifteen minutes or more for the household to reach filtration plant. It is also pertinent to mention here that households do not prefer to use drinking water from dams, unprotected taps or rivers even if it took time to reach filtration plant. In line with our expectations study had found that household’s wherein women are having autonomy in decision making for the household purchases are significantly more likely to use bottled water or from filtration plants for drinking purposes.
As mentioned in methodology section, in the next step, household behaviour of using different methods at home for water purification have been analyzed. Data of seven different in home water purification methods adopted by the households is available in the PDHS 2012-13. Due to very limited observations the use of have been clubbed with few other methods as others. Here the no treatment has been used as base category and Multinomial Logit (MNL) model is estimated. The results are present in table 3.

Table 3  
*Estimation results (use of water purification methods at home)*

<table>
<thead>
<tr>
<th>Variables</th>
<th>Boiling the water</th>
<th>Using cloth as filter</th>
<th>Electric Water Filters</th>
<th>Chlorine tablets and Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Household head’s sex</td>
<td>-0.1042</td>
<td>0.2984</td>
<td>0.4780</td>
<td>0.3223</td>
</tr>
<tr>
<td>Region</td>
<td>1.1593*</td>
<td>0.8890*</td>
<td>1.6001*</td>
<td>0.7723*</td>
</tr>
<tr>
<td>Household head’s age</td>
<td>-0.0031</td>
<td>0.0020**</td>
<td>0.0092</td>
<td>-0.0143</td>
</tr>
<tr>
<td>Family Size</td>
<td>-0.0573*</td>
<td>-0.0034</td>
<td>-0.0293</td>
<td>-0.0550**</td>
</tr>
<tr>
<td>Education of the household head</td>
<td>0.1312*</td>
<td>0.8601**</td>
<td>0.5721*</td>
<td>0.1141**</td>
</tr>
<tr>
<td>Wealth of household</td>
<td>0.7390*</td>
<td>0.0342</td>
<td>1.2760*</td>
<td>0.5912*</td>
</tr>
<tr>
<td>Awareness (Media exposure)</td>
<td>0.0793*</td>
<td>0.2071**</td>
<td>0.2083**</td>
<td>0.5962**</td>
</tr>
<tr>
<td>Women’s Empowerment</td>
<td>0.0113**</td>
<td>-0.1374</td>
<td>0.6182**</td>
<td>-0.0784</td>
</tr>
<tr>
<td>Diarrhea Incidence during past month</td>
<td>0.0741**</td>
<td>0.1220**</td>
<td>0.5672</td>
<td>0.1963</td>
</tr>
<tr>
<td>Constant</td>
<td>-7.0223*</td>
<td>-5.4562*</td>
<td>-15.1954*</td>
<td>-9.6250*</td>
</tr>
<tr>
<td>LR Chi Square</td>
<td>1513.590*</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p < 0.05; **p < 0.10

These results suggest that household’s place of residence is a significant factor in using the water purification methods. The urban households are more likely to adopt in house water purification methods in comparison to rural households. Study further reveals that urban households have a preference of using the electric water filters at home followed by boiling and using cloth as filters to purifying water. However, study unable to find any significant impact of sex of the household head on adoption of water purifying methods at home.
However, the age of the household head has significant impact on adoption of water purifying methods at home in one alternative (cloth filter). It suggests that household headed by more aged ones prefer to use the cloth as filters to purify water at home. Similarly size of the family is having significant and negative impact for the two alternatives (boiling water and use of chlorine tablets) out of four different alternatives. The possible reason is rather straightforward that with increase in family size, water requirements also increases and it may not be possible for these families to use filters. Therefore, they prefer not to use in home water purifying methods.

In line with the findings of first model it has been found that education and awareness (proxied by media exposure) have significant and positive impact on the adoption of in house water purifying methods (for all the alternative methods). Study also finds that households having awareness of hazards of using unsafe water have preference of using electric water filters at home followed by using cloth as filters and boiling water.

Similarly study also found that wealthier households significantly prefer to adopt electric water filters followed by boiling the water and using chlorine tablets to purify the water at home. However, there is no significant relationship of wealth on using cloth as filter for water purification. The empowerments of women also have significant and positive relationship with adoption of boiling and using electric filters to purify water at home. On the other hand, women empowerment failed to exhibit any significant impact on using cloth as filter and adoption of chlorine tablets to purify water at home.

The incidence of diarrhea by a family member of the household during last month have positive and significant relationship on adoption of boiling water and using cloth as filter to purify the water at home. However, it failed to portray any significant impact on use of electric filters and other alternative methods. It can be inferred that occurrence of diarrhea leads households to adopt only short term water purification methods at home.

Conclusion and Policy Implications

Unsafe drinking water is a critical health issue in developing countries because it results in different fatal diseases particularly hepatitis and diarrhea. According to the WHO (2004) estimates, diarrhea is main cause of the deaths of approximately 1.8 million people per annum, out of which 90% are children. Furthermore, unsatisfactory conditions of water and sanitation are the main reason of 88% of these deaths. Significance of safe drinking water for wellbeing of the society is the basic motivation in conducting the present study.

Study reveals that size of the family, residence in in urban areas, education of the household head, awareness about hazards of unsafe water (proxied by media exposure) by the household head, empowerment of women in household and distance to water play significant role in household’s
decision of choosing drinking water source. Similarly, wealth, residence in urban areas, size of the family, education of the household head, awareness about hazards of unsafe water (proxied by media exposure) by the household head women empowerment in household and the incidence of diarrhea by family member during last month have significant impact on household’s decision for adopting in house water purifying methods. However, study is unable to find significant impact of sex and age of the household head on adoption of in house water purifying method and choice of drinking water source.

Study provides insight to the policy makers in terms of household’s socio economic characteristics that become an obstacle for them in getting safe drinking water or to purify it at home. By using this analysis policy makers can take initiatives to target these segment of the population to improve the situation of safe drinking water in Pakistan. It was found that level of awareness and education of the household head are highly significant determinants of decision of using safe drinking water source as well as adoption of water purifying methods at home, therefore it is strongly recommended that government should launch awareness campaigns on media on regular basis about hazards of using unsafe water for drinking purposes along with benefits of using simple purifying methods at home. Study also reveals significance of women empowerment in household matters and recommends that efforts through legislative process must be made to empower women it would not only be beneficial for economic development (Akram, 2018) but it would also help in increasing the usage of safe drinking water in Pakistan.

References


RELATIONSHIP OF WORKING ENVIRONMENT, EMPLOYEE EMPOWERMENT, TRAINING & DEVELOPMENT AND ORGANIZATIONAL COMMITMENT

Nawaz Ahmed¹, Muhammad Ashraf² and Riaz Ahmed Mangi³

Abstract

Developing an environment which promotes the organizational commitment among employees is one of the most essential factors for sustainable organizational development. This may be argued, based on the literary evidences that committed employees can lead to higher organizational productivity. Organizational commitment has received impressive attention of researchers, however the studies on commitment among people in education sector in Pakistan yet to receive its due attention. The objective of this study is therefore, to explore the influences of working environment, employee empowerment, training & development on organizational commitment among employees working in business schools in Karachi, Pakistan. The data were collected using close ended questionnaire from 346 employees both faculty and administrative staff. Convenient sampling technique is used to gather the data. The collected data were analyzed using Structural Equation Modeling (SEM). The results of the study indicate that all the factors significantly influence the organizational commitment. The results of this study are anticipated to be value addition in higher education policies.

Keywords: Business Schools, Employee Empowerment, Training & Development, Organizational Commitment, Working Environment.

JEL Classification: M540

Introduction

Human resource has been witnessed as the most significant and important resource for attaining competitive edge over contemporary organizations. It is considered as driving factor for all the other important resources such as capital, equipment, information and monetary resources.

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Human resource of an organization is not only headcounts, but the versatility of culture, skill, ability, and societal interaction among business units. If this resource is well managed, can lead the firm towards the accomplishment of excellence, contrary beget the corporate stress (Armstrong, 2005). People in an organizational are required to be treated with greater care, as the quality treatment with employees while performing their related duties determines the organizational intentions to the growth of both employees and organizations. The age of cut throat competition and increasing pace of organizational excellence have necessitated the modern organizations to honor the commitment, they have had with their employees; devaluing or negating such words of commitment again begets the brain drain. Organizational commitment and employee behavior are directly proportional to each other. The positive attitude among employees while performing their assigned duties is subject to the amount commitment from management. A discontent worker is a negative ambassador to organization in talent market. Commitment is thus the greater source, which bonds both organization and employee (Buchanan, 1974).

The earlier studies on commitment have established the relationship with numerous factors. However, this research is bit unique in the sense it investigates the relationship between identified factors rarely studied in Pakistani context. More specifically in private owned Higher Education Institutions in Karachi.

**Purpose of Research**

The purpose of this research is to evaluate the factors including working environment, employee empowerment, training and development and their influence on organizational commitment.
Significance of the study

As the purpose of this study is to find out the factors promotes and demotes the amount of commitment among employees, therefore findings of this study can be valuable policy input for HR policies, particularly for education sector.

Literature Review

Working environment

To evaluate the nature of relationship between working environment and organizational commitment, several studies have been conducted and documented several distinct findings. Employee involvement, peer relation, manager support, authority to carryout tasks independently, handling work pressure, creativity and corporeal contentment have been studied as significant predictors of affective commitment (Moos, 1994). Both Continuance and normative commitment being indicators of organizational commitment stand aloof toward above said working environment factors. Chughtai and Zafar (2006) reported the positive significant relationship between work environment and organizational commitment among teachers in university of Lahore. The study further concluded that supervisors’ role had a significant influence on organizational commitment. The behaviors, norms and practices of both organizational procedural execution and employees’ practices constitute the working environment in an organization. Thus retaliating behaviors, deviating practices, unfair procedures signify the existence of discouraging working environment.

The study regarding the relationship of work environment, burnout, managerial and individualistic variables with organizational commitment, concluded negative association with continuous commitment (Maqsood, 2011). Baher and Ziabari (2014) reported that congenial working environment begets the sense of commitment among employees. Even the suitable room temperature while working can cause improved commitment among employees (Parveen, Sohail, Naeem, Azhar & Khan, 2014). Bhatti, Bhatti, and Akram (2016) found the negative association between working environment stressors and organizational commitment among bankers. The significant influence of working environment on organizational commitment among librarians has been studied in Nigerian context (Mayowa-Adebara, Okeoghene & Aina, Folashade, 2016). Hanaysha (2016) found significant influence of working environment on organizational commitment. The researchers like Hanaysha (2016), is of this opinion that the working environment suited to the employees shows the extent of commitment from the part of organization. The knowledge workers particularly in education sector needs more positive and encouraging working environment to discharge their duties. The educators are the developers of leaders (Lieberman, 2011). Despite of all these literary evidences, there is still dearth of studies focusing the state of commitment and working environment among employees of business schools in Karachi. We have therefore formulated following hypothesis for the study

H1: There is no relationship between working environment and organizational commitment.
Employee Empowerment

The authority to execute the powers conferred to an individual refers to empowerment. More simply it refers to an individual’s freedom to do and to achieve the desired objective (Sen, 1985). The history of having freedom and empowerment is deeply rooted into human experience. Thus it has been extensively studied since long. In a work setting it is referred as employee empowerment. Hunjra, Haq, Akbar and Yousif (2011) reported that empowerment is fundamental ingredient to achieve organizational milestone. Employee empowerment is considered as motivational and managerial tool, which is intended to increase the opportunities of participation in organizational decision making, which in turn overcome the barriers between management and employees (Meyerson & Dewettinck, 2012).

The merits of employee empowerment in an organizational setting have significant value. For instances, it can increase the sense of ownership among employees, when they perceive that they have their input in important decisions (Jacquiline, 2014) and becomes the ambassadors to the managerial decision (Roberts, 2014). Any favorable policy about employee empowerment is targeted to share the managerial responsibility and authority of decision making, the commitment among employees and motivation to work is improved (Biore, 2015; Fernandez & Moldogaziev, 2015). Several past studies have endorsed the significance employee empowerment in predicting organizational commitment (Kun, Hai-yan, & Lin-li, 2007; Insan, A. N., Astuti., Raharjo, & Hamid 2013; Gholami, Soltanahmadi, Pashavi, & Nekouei, 2013). This study has therefore formulated following hypothesis to be tested in the context of privately owned business schools in Karachi.

H2: There is no relationship between Employee Empowerment and Organizational Commitment.

Training and Development

The modern business practice seems to be characterized by the quality of competitiveness among rival businesses. The changing and diversified working environment has made the situation challenging for entrepreneurial practices. In this regard the knowledge and skill of the people working with organization is of single most important factor, for its persistent development and progress. The knowledgeable and skilled workers proved to be significant determinant to gain competitive edge in market place (Becker, Bose, & Freeman, 2006). To become effective and efficient to response the challenges the ongoing training programs are essential to be developed from time to time (Barlett, 2001; Meyer, Stanley, Herscovitch, & Topolnytsky, 2002). The continuous and effective training increases the performance of employees on job (Hafeez & Akbar, 2015; Hanaysha, 2016). The organizations are required to remain vigilant to assess the need of training among employees, so that skill gap may be bridged and also to motivate to provide them reason to work (Edid, 2007). This eventually promotes the loyalty and amount of commitment for the organization (Owoyemi, Oyelere, Elegbede, & Gbajumo-Sheriff, 2011).
For the persistent organizational growth and future challenges the employee development programs are required to be formulated. Employee development program assist the employees to become continuous learner, regardless of organizational need (Jacobs & Washington, 2003). Previous surging studies on training and development have confirmed that it has positive influence on job satisfaction (Leppel, Brucker, & Cochran, 2012; Sabir, R. I., Akhtar, Bukhari, Nasir, & Ahmed, 2014; Tahir, Yousafl, Yousaflai, Jan, & Hashim 2014) and the amount of commitment among employees (Bulut & Culha., 2010; Hassan & Mahmood, 2016). Training and continuous proficient development can usher the amount of commitment among employees (Tarasco & Damato, 2006). Nksoi (2015) and Qiao, Luan and Wang (2008) also reported that training and development can enhance the organizational commitment. On the basis above discussion following hypothesis is formulated to be tested

\[ H_3: \text{There is no relationship between Employee training & Development and organizational commitment} \]

\[ H_3: \text{There is no relationship between Employee training & Development and organizational commitment} \]

**Figure 1: Conceptual Frame Work**

**Methodology**

For achieving aforementioned objective of the study, we have made population, the people working in business schools of various private owned universities in Karachi, Sindh, Pakistan. The target population for the study is both administrative and academic staff. Quantitative research
approach is most frequently used technique to assess the causal effect among the variable of interest. In order achieve the set objective of the study we have collected the data from 346 employees, by using convenient sampling technique as the population frame was not made available. The sample size was determined through the online calculator (Christensen, Johnson, & Turner, 2014). The data collection instrument for this study has been borrowed from several previous studies. For organizational commitment we have taken into account the scale of Mowday, Steers and Porter (1979). The employee empowerment was measured through the scale developed Men (2010). For measuring working environment, we have used Working Environment Questionnaire (WEQ) with changes to suit the condition and the context. An adapted scale for measuring training and development, a six item based questionnaire of Schmidt (2004) has been used for this study. For the seeking the face validity the questionnaire prior to collecting data it was presented before experts.

**Analysis of the Results**

The selected respondents were requested personally to fill the questionnaire, however out of 500 questionnaires, only 434 were returned, of which 346 were useable constituting the response rate 69.2% (30.5%) were female respondents, whereas rest of them were male respondents. The mean age group of female respondents was 35 years, whereas it was 45 years of male respondents. The majority of the respondents were having more than 2 years of work experience with the business schools. The data about academic qualifications showed that majority of them had Masters Degrees (79%); however, the greater chunk in this regard were among female respondents constituted (66%). In order the test the reliability of the data collection instruments used in this study, we have conducted Cronbach’s alpha reliability test using SPSS 20 software (IBM, 2011). The results showed the all the value of the selected research constructs namely organizational commitment (0.70) Employee empowerment (0.78), working environment (0.88) and employee training & development were (0.92), thus fairly acceptable. Making test robust we have calculated composite reliability (CR) test for all constructs of the study using Microsoft Excel. The result of the CR was 0.876 for working environment, 0.870 for employee empowerment, 0.894 for training & development and for organizational commitment the CR was 0.892, fairly acceptable (Pallant, 2010).  Confirmatory Factor Analysis (CFA) was conducted to check the construct validity. The construct validity is computed by Average Variance Extracted; the AVE is determined through the formula No. 1. The related AVEs are given in table 2. In this regard the Structural Equation Modeling (SEM) was executed using AMOS 20 (Arbuckle, 2011) through measurement model carrying all items. In CFA results it was confirmed that the factors showed loadings ranges from 0.40 to 0.94 were retained and rest eliminated systematically, thus the items were in aligned with suggested cut-off (Hair, Black, Babin, & Anderson, 2010; IRMA, 2015).

\[
\text{AVE} = \frac{\text{Sum of Standardized Loading Square}}{\text{Sum of Standardized Loading Square} + \text{measurement error}} \quad \text{(1)}
\]

\[
\text{Measurement Error} = 1 - (\text{Standardized loading})^2 \quad \text{(2)}
\]
After conducting CFA, the structural model was drawn and the goodness of fit for the data was ensured. The model is shown in figure 2:

<table>
<thead>
<tr>
<th>Variables</th>
<th>Constructs</th>
<th>Factor Loading</th>
<th>Cronbach’s Alpha</th>
<th>Composite Reliability</th>
<th>AVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working Environment</td>
<td>EP1</td>
<td>.82</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>EP2</td>
<td>.83</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>EP3</td>
<td>.75</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>EP4</td>
<td>.78</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>EMP1</td>
<td>.87</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employee Empowerment</td>
<td>EMP2</td>
<td>.94</td>
<td>.78</td>
<td>.870</td>
<td>.770</td>
</tr>
<tr>
<td></td>
<td>EMP3</td>
<td>.68</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>EMP4</td>
<td>.59</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Training &amp; Development</td>
<td>TD1</td>
<td>.77</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TD2</td>
<td>.93</td>
<td>.92</td>
<td>.894</td>
<td>.870</td>
</tr>
<tr>
<td></td>
<td>TD3</td>
<td>.91</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TD4</td>
<td>.87</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organizational Commitment</td>
<td>OC1</td>
<td>.91</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>OC2</td>
<td>.95</td>
<td>.70</td>
<td>.829</td>
<td>.780</td>
</tr>
<tr>
<td></td>
<td>OC5</td>
<td>.50</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Figure 2: Presented above is the structural model along with fit indices i.e. parsimonious, incremental and absolute, which are further presented in table 3.

Table 2

<table>
<thead>
<tr>
<th>Model</th>
<th>Absolute Fit Indices</th>
<th>Incremental Fit</th>
<th>Parsimonious Fit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\chi^2$</td>
<td>GFI</td>
<td>AGFI</td>
</tr>
<tr>
<td>1</td>
<td>84</td>
<td>307.171</td>
<td>.916</td>
</tr>
</tbody>
</table>

The chi square value for data was significant, which were required to be insignificant, however the test is sample sensitive. Which always returns with p-value 0.000, as in our case means more the sample size more the significance of chi-square will be. Therefore, we have also taken into account other indices as well. In supporting the chi-square we have (df=85, GFI = 0.916, AGFI = 0.881, TLI = 0.927, CFI, 0.924 and RMSEA 0.072, PNFI=739, PCFI=.757). On the basis of the given fit indices the model was fit enough, however to test if the formulated hypotheses for the study either retained or rejected. For this purpose, we have presented the regression results generated from the output of the structural model. Thus the results for the hypotheses are presented into table 4.
Table 3
Hypotheses Assessment Summary

<table>
<thead>
<tr>
<th>Hypotheses Statements</th>
<th>Estimate</th>
<th>S.E</th>
<th>C.R</th>
<th>P</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>H₁ There is no relationship between working environment and organizational commitment</td>
<td>.209</td>
<td>.057</td>
<td>3.65</td>
<td>.000</td>
<td>Significant</td>
</tr>
<tr>
<td>H₂ There is no relationship between Employee empowerment organizational commitment</td>
<td>.244</td>
<td>.055</td>
<td>4.43</td>
<td>.000</td>
<td>Significant</td>
</tr>
<tr>
<td>H₃ There is no relationship between Employee training &amp; Development and organizational commitment</td>
<td>.261</td>
<td>.054</td>
<td>4.83</td>
<td>.000</td>
<td>Significant</td>
</tr>
</tbody>
</table>

The findings of the analysis given in the table 4 shows that working environment has no effect on organizational commitment ($\beta = .209$, t-value = 3.65, p > 0.01), thus H1 is rejected. The results further revealed that employee empowerment is significantly associated with organizational commitment ($\beta = 0.245$, t-value = 4.43, p < 0.01), therefore H₂ is rejected. The findings also indicated that employee training and development is positively related with organizational commitment ($\beta = 0.261$, t-value = 4.83, p < 0.01), hence the H₃ is also rejected. The investigated factors namely working environment, employee empowerment and training & development collectively explain 60 percent variance in organizational commitment.

Discussion and Conclusion

To examine the influence of working environment, employee empowerment, and training development on organizational commitment was the objective of this study. The data was collected from the employees working in different business schools in privately owned universities, Higher Education Institutions (HEIs) in Karachi Pakistan. The results of this study showed that working environment do not predict organizational commitment. The findings of this study revealed that employee empowerment significantly predicts the organizational commitment, thus the findings are in alignment of the results documented by (Hanayasha, 2016; Gholami, Soltanahmadi, Pashavi, & Nekouei, 2013). Employee empowerment promotes the sense of belongingness and feelings of ownership among employees, which can eventually ameliorate the commitment and performance on job (Ahmad & Onanye, 2010). The studies have confirmed that an authorized employee will highly motivate towards the achievement of organizational objectives. Thus it is authenticated that employees in business schools of Karachi should be equipped with sufficient empowerment, so that sense of commitment may be created among them.

The results of the study also confirm that training and development significantly influence the organizational commitment. The similar findings have been documented by several scholars (Han-
ayasha, 2016; Karimi, 2016; Dias & Silva, 2016). The results of the study confirm that training is very useful managerial tool to fill the skill gap and making the employees ready to meet the future challenges. Thus the training and development is very helpful for gaining competitive advantage. Like most of the researches this study have also some limitations, the focus of this study was only people working in business schools in private owned universities and HEIs, and they got a different culture than that of public sector universities and HEIs, therefore the findings of this study may not be generalizable to public sector universities. This investigation was conducted quantitatively; therefore, further studies can be conducted qualitatively. The number of variable were obviously limited in this study other variables, mediation, moderation analysis is suggested.

References


human resource, 2(2), 1-12.


RELATIONSHIP BETWEEN CURRENT ASSETS MANAGEMENT AND FIRM’S MARKET VALUE: EVIDENCE FROM PAKISTAN

Mehwish Riaz1, Saba Haider2 and Mohsen Shafiq3

Abstract
Business concerns must pay close attention to the management of current assets. This ensures a sufficient level of cash balances as well as other current assets, including stock (trade stock), and receivables. However, limited and/or overindulgence of current assets can cause serious threats to firms. Therefore, this study attempts to empirically test whether or not managing current assets influences the market value of firms with a sample of 59 firms from different industries listed at Karachi Stock exchange including textile, cement, chemical, sugar, fuel & energy and engineering industry. Data is gathered on quarterly basis from firms’ financial reports for the period of 8years (2008-2015). The GMM estimation technique is used to analyze the data. The analysis is conducted in 2 stages: firstly, separate industry to industry analysis is performed analyzing whether or not the association among the variables varies from industry to industry. Secondly a general estimation is performed to determine a general connection among the variables. The results indicate statistically significant connection of current asset management and firm’s market value; however, in some industries this relation is negative while in others it is positive. This leads to the conclusion that association between firm’s current assets management and market value depends on industry at which firm exists. Therefore, to augment the shareholder’s wealth, authorities and decision makers are needed to consider that how the management of current assets affects its market value.

Keywords: Current Asset Management, Market Value of the Firm, Wealth Maximization, Karachi Stock Exchange.

JEL Classification: G100

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Introduction

Managing current asset is considered very vital for business concerns as, the largest part of their investment lies in their current assets. Management of current assets requires maintaining an adequate amount of current assets including liquid money, trade debts, stock and marketable securities (Graham, 2001). This is because that the inadequate levels of current assets (excess as well as limited level of current assets) can cause serious threats to the company. The limited levels of current assets not only create the liquidity problems for the business but also increase the operating risk of the firm. Alternatively, the excess of current asset adds on to the cost of company eventually affecting the firm value. Mahmoudzadeh et al. (2017) argued that assessment of working capital is essential for business operations as having uncertain working capital usually keep the production low because of risks in operations and results in liquidity problems.

Management of current assets is considered as of crucial importance to develop the business level strategies that aim at enhancing the shareholder’s wealth (Afza & Nazir, 2007). Afza and Nazir (2007) also claimed that sustaining a minimum optimal level of current assets not only help the firms to generate the maximum possible revenues but also makes the firm able to generate free cash flows. These free cash flows increase the growth opportunities for the business and ultimately the shareholder’s return. Conversely, the unnecessary levels of current assets result in piling up more inventories, higher amount to money tied in receivables and keeping excess cash leads to the inefficient deployment of available resources therefore, value of firm will be negatively influenced by keeping redundant levels of these current assets. Therefore, conclusion can be drawn that decisions regarding current assets management ultimately influence the value of firm. Lewellen and Lewellen (2016) also found that lack of investment opportunities, financing frictions and free-cash flow problems bound firms to have a less amount of investment and cash flow that can eventually influence the value of firm. Hence, one of the main financial decisions of a firm is to ensure a suitable level of current assets that maximize its value.

Furthermore, Afza and Nazir (2007) exerted that effective management of current assets can increase company’s rate of return as it has ability to positively influence the free cash flows of company. Moreover, Makelainen (1998) argued that a company having higher returns than its cost of capital is able to successfully enhance the value of its share in the market thereby increasing the shareholder’s wealth. Thus, better management of current asset can help increasing the rate of return of firm that may influence the value of firm in a positive way.

Therefore, the study aims at examining the connection of current asset’s management & firm value. Since, management of current assets can be measured through cash conversion cycle that’s why the researcher has used this measure is used as proxy of management of current assets & to analyze its impact on value of firm.
Study Objectives

The objectives of this empirical study are to:

1. Examine the impact of current assets management on the market value of firm in general (collectively) & industry-wise separately.

2. Analyze the influence of individual components of assets management on the market value of firm in general (collectively) and industry-wise separately.

Literature Review

Current asset management has remained the center of interest for many researchers’ academicians and businesses in the past. Ogundipe et al. (2012) argued that WCM (working capital management) that reveals the management of current asset and liabilities have power to influence profitability and firms’ value of the business concerns. This is the reason that many researchers have put forth their efforts to study the relationship between the working capital and profitability of the firm. However, relationship between the current asset management and firm’s market value is not much explored area rather has been neglected. Therefore, in the present study, researchers tried to find the link between these two.

Sudiyatno et al. (2017) examined the linkage of working capital, firm value and performance taking the statistics of companies listed at Indonesian Stock Exchange. Results signify that working capital has significant positive influence on the firm performance however, this firm performance negatively influence the firms’ value. Researchers further suggested that the corporate performance is not considered as a positive signal for the future investor.

Kasiran et al. (2016) proposed that an effective management of working capital results in sustainability and growth of the firm. However, improper utilization of working capital will restrict the firm to avail short term investment opportunities as a result of liquidity crisis. In other times, Jędrzejczak-Gas (2017) claimed that during economic crisis firms should have more current liabilities than current assets to ensure low cost of capital.

Linkage between working capital management and firm’s value is also explored by Wasiuzzaman (2015) studied in case of emerging markets. For this purpose, she took the data of Malaysian firms and on the basis of results of the study it was concluded that reduction in working capital management is positively associated with the firm’s market value. However, she further reported that this linkage is subjective to the financial constrained faced by the business. The firms facing financial constraints shows positive association between reduction and working capital and firms market value.
while those having no financial constraints do not hold this relationship.

Ademola and Kemisola (2014) studied how working capital management influences the value of firm taking data of manufacturing firms of Nigeria. On the basis of their findings they concluded that working capital management has significant influence on the market value of the firms. They further suggested that managers must consider the proper management of working capital while taking any financial decision as it can have impact on the shareholder’s wealth.

Autukaite and Molay (2014) studied the impact of cash holdings and working capital on firm’s value. To investigate the relationship among the variable researchers took the data from the companies of France. The results suggested that holding excess cash and working capital management undervalue the shareholder’s wealth. They further suggested that management must not undervalue the working capital and cash holdings importance as it can be very costly for the firm otherwise.

Targeting to explore the connection of working capital management, value of firm and profitability Ogundipe, Idowu, and Ogundipe (2012) took data from 54 firms (non-financial) listed at Nigerian Stock exchange. Findings of their research showed the existence of a negative & significant link cash cycle and firm’s profitability and between cash cycle and firm’s value. There results were in line with the previous literature however, negative relationship in case of CCC and firm’s market value was contradictory with the previous literature.

Using the data of Malaysian firms Mohammad et al. (2010) tried to examine the impact of working capital management on firm’s market value and profitability. For this purpose, they used multiple regression and Pearson correlation techniques. Findings of their study confirmed that cash cycle & firm’s value and cash cycle & profitability are linked negatively and significantly with each other.

In an attempt to explore the impact of liquidity management on firm’s profitability and market value, Wang (2001) took the data from 1555 Japanese firms and 379 firms of Taiwan, listed at their relevant stock exchanges, for 11 years. They conducted a Pearson correlation analysis and confirmed that cash cycle and operating performance of the firm relates negatively. On the other hand, they concluded that a shorter cash conversion cycle causes an increase in the value of the firm. They also suggested that more firms of Japan are having Tobin’s Q greater than 1 in the presence of shorter cash conversion cycle.

However, up to the researchers’ best knowledge no attempt has been made in Pakistan to explore the influence of cash conversion cycle on market value of firm. Therefore, the present study tried to explore the same said relationship in context of Pakistan. Researchers have explored the said relationship in two folds: i) a combined general analysis is performed using the data of all the selected
firms. ii) Secondly, the same relationship is tested for each industry separately. This is done to study the industry to industry differences between the cash cycle and firm’s market value linkage.

Hypotheses

H1 : There is a significant relationship between firm’s market value and Cash Cycle.
H2 : There is a significant relationship between firm’s market value and day’s payment outstanding.
H3 : There is significant relationship between firm’s market value and day’s inventory outstanding.
H4 : There is significant relationship between firm’s market value and day’s sales outstanding.

Methodology

In order to examine the impact of Cash Conversion Cycle on market value of firm, researchers have taken a sample of 59 companies that are listed at Karachi stock exchange (KSE). These 59 companies are taken from the manufacturing industries listed at KSE. Among these industries are Engineering, Sugar, Fuel & Energy, Chemical, Cement and Textile industry.

Sample and Data Set

Intending to explore the relation of Cash cycle and market value of firm, data on quarterly basis is gathered for 8 years from 2008 to 2015, from the financial report of selected firms. Therefore, in this way panel dataset containing 1888 of firm-year observations is constructed. Given table indicates the details of sample taken from each industry.

Table 1
Percentage of Sample from Each Selected Industry

<table>
<thead>
<tr>
<th>Name of Industry</th>
<th>Total no. of firms</th>
<th>No. of Firms selected</th>
<th>% Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering</td>
<td>14</td>
<td>10</td>
<td>71%</td>
</tr>
<tr>
<td>Chemical</td>
<td>33</td>
<td>11</td>
<td>33%</td>
</tr>
<tr>
<td>Fuel &amp; Energy</td>
<td>12</td>
<td>9</td>
<td>75%</td>
</tr>
<tr>
<td>Sugar</td>
<td>24</td>
<td>9</td>
<td>37.50%</td>
</tr>
<tr>
<td>Cement</td>
<td>18</td>
<td>11</td>
<td>61%</td>
</tr>
<tr>
<td>Textile</td>
<td>92</td>
<td>9</td>
<td>10%</td>
</tr>
</tbody>
</table>
Variables and their Description

The selection of variables to examine the connection of cash cycle & firm’s value is largely inclined by the previous literature. To estimate Firm’s value, Tobin’s Q is used as a proxy. Here, researchers not only measured the relationship between cash conversion cycle but also attempted to explore the link between individual components of cash conversion cycle namely day’s inventory outstanding, day’s payment outstanding and day’s sales outstanding & firm’s value. Also, along with these independent and dependent variables, few control variables have also been used in this study including current liability to total liability ratio, firm size, current ratio, ratio of debt to total asset and fixed asset to total asset.

Table 2
Formulas of Variables

<table>
<thead>
<tr>
<th>Variable and Proxies</th>
<th>Formula and Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash Conversion Cycle</td>
<td>Days inventory outstanding + Days sales outstanding – day’s payment outstanding</td>
</tr>
<tr>
<td>Tobin’s Q</td>
<td>Book Value to liabilities + Market Value of owner’s equity / Book Value of assets</td>
</tr>
<tr>
<td>Day’s in sales outstanding</td>
<td>(Trade Receivable / Credit sales) * 365</td>
</tr>
<tr>
<td>Day’s payment outstanding</td>
<td>(Creditors /On-Account Purchases) * 365</td>
</tr>
<tr>
<td>Day’s Stock outstanding</td>
<td>365/ Stock turnover ratio</td>
</tr>
<tr>
<td>Debt to asset</td>
<td>Total long term + short term debt / Book value of total assets</td>
</tr>
<tr>
<td>Non-current Assets to Total assets</td>
<td>Book value of Non-current assets/ book value of total assets</td>
</tr>
<tr>
<td>Current Liabilities to Total Liabilities</td>
<td>Current Liabilities / Total Liabilities</td>
</tr>
</tbody>
</table>
Econometric Model

Prior studies have confirmed the fact that firm value is usually significantly related to its own lagged term. Therefore, in this present study researchers have also included the lagged dependent variable as independent variable. Hence the model will be

\[ TBQ = \beta_0 + \beta_1 TBQ_{t-1} + \beta_2 \text{CLTC}_{t-1} + \beta_3 \text{FATA}_{t-1} + \beta_4 \text{CATA}_{t-1} + \beta_5 \text{Insales}_{t-1} \]
\[ + \beta_6 \text{de\_ratio}_{t-1} + \beta_7 \text{TDTA}_{t-1} + \beta_8 \text{CCC}_{t-1} + \epsilon_t \]

(a)

Since, the Panel data violates few assumptions of ordinary least square estimation technique, therefore, it is not considered an efficient statistical approach for panel data. However, fixed effects model and/or random effects model are usually acceptable approaches for panel data set but under certain conditions. As, it can be seen that above stated model is an autoregressive (endogenous) model therefore, in the presence of lagged dependent variable, fixed effect model generate biased results. According to Nickell (1981), in the presence of endogenous variable the bias can be zero if data is taken on larger time horizons. So, it can have concluded that in the presence of endogenity fixed effect model can only be appropriate to use if data has been gathers for long time frames.

Alternatively, if time period is small to moderate one cannot use fixed effect approach rather will shift to several other estimation techniques available for panel data (In the presence of endogenity). These estimators are mainly:

- Kiviet (1995), corrected LSDV estimator approach
- Arellano, Bond (1991), 2 stage GMM estimation approach
- Anderson, Hsiao (1981), instrumental variable approach

In the present study researchers have used GMM estimation approach proposed by Arellano and Bond (1991) to estimate the above stated econometric model.

Why the Arellano – Bond GMM estimator?

Cash Cycle and firm’s value can be examined using following model.

\[ TBQ = \beta_0 + \beta_1 TBQ_{t-1} + \beta_2 \text{CLTC}_{t-1} + \beta_3 \text{FATA}_{t-1} + \beta_4 \text{CATA}_{t-1} + \beta_5 \text{Insales}_{t-1} \]
\[ + \beta_6 \text{de\_ratio}_{t-1} + \beta_7 \text{TDTA}_{t-1} + \beta_8 \text{CCC}_{t-1} + \epsilon_t \]

(b)

Basic Distinctiveness of the model

1. There are some characteristics of the error term that are time invariant (fixed effect). Therefore, it can be said that error term may comprised of some observation-specific effects
eit that are overlooked as well as some unseen company-specific effects via error term

$$\mu_t = \nu_t + e_t$$

2. The company-specific fixed distinctive features (time invariant), like strengths of a company, its management and competitive advantage etc may correlate with the regressors included in the model.

3. One of the explanatory variable $\beta_{1}TBQ_{i,t-1}$ that is integrated as lagged dependent variable in the model actually give rise to autocorrelation.

FE model can only be employed for the models having above mentioned 1 and 2 characteristics. But in the presence of 3rd problem fixed effect estimation technique cannot be used. Therefore, in this situation difference GMM proposed by Holtz-Eakin, Newey and Rosen (1988) or Arellano – Bond (1991) GMM estimation can be the best estimation techniques.

To resolve the 2nd issue discussed above through difference GMM take the first-difference of equation (1):

$$TBQ_{i,t} = \beta_{0} + \beta_{1}TBQ_{i,t-1} + \beta_{2}Insales_{i,t-1} + \beta_{3}CLTC_{i,t-1} + \beta_{4}FATA_{i,t-1} + \beta_{5}FATA_{i,t-1} + \beta_{6}CLTC_{i,t-1} + \beta_{7}CCCI_{i,t-1} + \beta_{8}TBQ_{i,t-2} + e_t$$

Deducting equation (1) from (2):

$$\Delta TBQ = \Delta \beta_1 TBQ_{i,t-1} + \Delta \beta_2 CLTC_{i,t-1} + \Delta \beta_3 FATA_{i,t-1} + \Delta \beta_4 CAT_{i,t-1} + \Delta \beta_5 Insales_{i,t-1} + \Delta \beta_6 de_{ratio_{i,t-1}} + \Delta \beta_7 TDTA_{i,t-1} + \Delta \beta_8 CCC_{i,t-1} + \Delta e_t$$

Here the first difference is taken to eliminate the unobserved time invariant company-specific effects, vi. Then the GMM estimation technique instruments lagged dependent variable included in the above model explanatory variable to its past levels in order to resolve problem 3. So, it means using GMM estimation technique help resolving all these problems and produce unbiased and efficient results. That’s why in order to find the true and unbiased results GMM estimation technique is used in this present study. Therefore, the econometric models to measure the impact of cash conversion cycle and its component on firm’s market value through GMM Estimation technique are:

$$\Delta TBQ = \Delta \beta_1 TBQ_{i,t-1} + \Delta \beta_2 CLTC_{i,t-1} + \Delta \beta_3 FATA_{i,t-1} + \Delta \beta_4 CAT_{i,t-1} + \Delta \beta_5 Insales_{i,t-1} + \Delta \beta_6 de_{ratio_{i,t-1}} + \Delta \beta_7 TDTA_{i,t-1} + \Delta \beta_8 CCC_{i,t-1} + \Delta e_t$$ (Model 1)
Whereas:

TBQ = Tobin’s Q
DIO = Days in inventory outstanding
DPO = Days in payment outstanding
DSO = Days in sales outstanding
CCC = Cash Conversion Cycle

**Estimations and Results**

The present study estimates the linkage of cash cycle, its components & firm’s value in two different aspects i) at first, researcher conducted industry-wise analysis between the said variables ii) then in the second step, a general combined estimation is performed to conclude a general connection among the variables.

**Model 1:**

To test the 1st hypotheses given model is analyzed through GMM estimation method and the findings are presented in following table:

\[
\Delta TBQ = \Delta \beta_1 TBQ_{i,t-1} + \Delta \beta_2 CLTC_{i,t-1} + \Delta \beta_3 FATA_{i,t-1} + \Delta \beta_4 CATA_{i,t-1} + \Delta \beta_5 \ln sales_{i,t-1} \\
+ \Delta \beta_{de\_ratio}_{i,t-1} + \Delta \beta_7 TDA_{i,t-1} + \Delta \beta_8 DIO_{i,t-1} + \Delta e_i (Model 2)
\]

\[
\Delta TBQ = \Delta \beta_1 TBQ_{i,t-1} + \Delta \beta_2 CLTC_{i,t-1} + \Delta \beta_3 FATA_{i,t-1} + \Delta \beta_4 CATA_{i,t-1} + \Delta \beta_5 \ln sales_{i,t-1} \\
+ \Delta \beta_{de\_ratio}_{i,t-1} + \Delta \beta_7 TDA_{i,t-1} + \Delta \beta_8 DSO_{i,t-1} + \Delta e_i (Model 3)
\]

\[
\Delta TBQ = \Delta \beta_1 TBQ_{i,t-1} + \Delta \beta_2 CLTC_{i,t-1} + \Delta \beta_3 FATA_{i,t-1} + \Delta \beta_4 CATA_{i,t-1} + \Delta \beta_5 \ln sales_{i,t-1} \\
+ \Delta \beta_{de\_ratio}_{i,t-1} + \Delta \beta_7 TDA_{i,t-1} + \Delta \beta_8 DSO_{i,t-1} + \Delta e_i (Model 4)
\]
Table 3

*Estimations of Relationship of CCC and Firm’s market value*

<table>
<thead>
<tr>
<th>Industry Name</th>
<th>β of CCC</th>
<th>S. Errors</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical</td>
<td>-0.00219</td>
<td>-0.000685</td>
<td>0.0018</td>
</tr>
<tr>
<td>Engineering</td>
<td>-0.0000904</td>
<td>-4.52E-05</td>
<td>0.0488</td>
</tr>
<tr>
<td>Textile</td>
<td>0.0002619</td>
<td>-0.001415</td>
<td>0.00676</td>
</tr>
<tr>
<td>Cement</td>
<td>0.00000216</td>
<td>-1.08E-05</td>
<td>0.2456</td>
</tr>
<tr>
<td>Fuel and Energy</td>
<td>-0.000331</td>
<td>-9.21E-05</td>
<td>0.0006</td>
</tr>
<tr>
<td>Sugar</td>
<td>0.0000548</td>
<td>-4.46E-05</td>
<td>0.2417</td>
</tr>
</tbody>
</table>

Upon carefully analyzing the results presented in the table above it can be confirmed that there exists positive link between firm value and Cash Conversion Cycle in cement, Sugar & textile industry. Contrary to this rest of three industries showed negative relation indicating long cash cycle put negative influence the value of firms. This negative linkage between CCC and TBQ is in line with the findings Muhammad and Marisa (2010), and Wang (2001). One of the possible reasons of this negative linkage between the said variables is that, firms who manage getting back the cash from the cycle shortly; can utilize this free cash for profitable investment thereby increase their returns. The increased returns help creating a positive influence on the share price increasing ultimately the market value of the firm.

Contrary to this, the positive relationship between CCC and TBQ indicating that longer cash cycle is associated with higher firm’s value. This positive relationship can be explained through the fact that the when cost of retaining cash in current assets through piling up the inventories or/and extending credit limit of debtors, is much less as compared to the cost of lost sales due to unavailability of inventories in time and granting credit for shorter time span.

*Model 2:*

To test the 2nd hypotheses given model is analyzed through GMM estimation method and the findings are presented in following table:

\[
\Delta TBQ = \Delta \beta_1 TBQ_{t-1} + \Delta \beta_2 CLTC_{t-1} + \Delta \beta_3 FATA_{t-1} + \Delta \beta_4 CATA_{t-1} + \\
\Delta \beta_5 Insales_{t-1} + \Delta \beta_6 de_{ratio_{t-1}} + \Delta \beta_7 TDTA_{t-1} + \Delta \beta_8 DSO_{t-1} + \Delta e_t
\]
Researchers have also studied TBQ and components of CCC individually through GMM estimation approach. The results presented in the above table, clearly indicate that TBQ and DSO (days sales outstanding) relates negatively in case of all industries (excluding textile industry). This negative connection indicates that shorter collection periods lead to improve the value of firm. One of the possible reasons of this negative linkage between the said variables is that, firms who manage getting back cash from the cycle shortly; can utilize this free cash for profitable investments thereby increase their returns. The increased returns help creating a positive influence on the share price increasing ultimately the market value of the firm.

Contrary to this, the positive relationship of DSO and TBQ indicating that longer DSO is associated with higher firm’s value. Indeed, some industries have been allowed to increase credit limits and long-term lines of credit to attract the customers. If companies in these industries do not comply with this code, they may lose customers, which can lead to lower returns that can hurt their value.

Model 3:

The 3rd hypothesis is tested using given model and is analyzed through GMM estimation method and the findings are presented in following table:

\[
\Delta TBQ = \Delta \beta_1 TBQ_{t-1} + \Delta \beta_2 CLTC_{t-1} + \Delta \beta_3 FATA_{t-1} + \Delta \beta_4 CATA_{t-1} + \Delta \beta_5 \ln sales_{t-1} + \Delta \beta_{de \_ratio_{t-1}} + \Delta \beta_7 TDFA_{t-1} + \Delta \beta_8 DIO_{t-1} + \Delta e_{it}
\]
Table 5
Estimation of Relationship of DIO and Firm’s market value

<table>
<thead>
<tr>
<th>Industry Name</th>
<th>β of DIO</th>
<th>S. Errors</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical</td>
<td>-0.000488</td>
<td>0.000372</td>
<td>0.2752</td>
</tr>
<tr>
<td>Engineering</td>
<td>0.000115</td>
<td>9.58E-05</td>
<td>0.2323</td>
</tr>
<tr>
<td>Textile</td>
<td>0.000412</td>
<td>0.00025</td>
<td>0.1002</td>
</tr>
<tr>
<td>Cement</td>
<td>0.0000306</td>
<td>8.28E-05</td>
<td>0.7119</td>
</tr>
<tr>
<td>Fuel and Energy</td>
<td>-0.0025</td>
<td>0.0001072</td>
<td>0.0223</td>
</tr>
<tr>
<td>Sugar</td>
<td>-0.00172</td>
<td>2.98E-06</td>
<td>0</td>
</tr>
</tbody>
</table>

The results presented in the above table, clearly indicate that TBQ and DIO (days sales outstanding) relates negatively in 3 of industries including fuel & energy, sugar and chemical. While in rest of 3 industries said variables are found to have a positive linkage. It is evident from the table presented above that engineering industry’s coefficient of DIO is statistically insignificant.

The negative relation in DIO and TBQ shows that faster a company sells a product, the higher its market value. This is because that the less time a company takes to sell a product, the better its sales. These higher sales will allow the company to make higher profits. Higher inventory turnover days may indicate excess inventory, missing product lines, or ineffective commercial marketing efforts. However, higher inventory turnover rates may be appropriate, for example when inventory levels are high, in anticipation of rapid price increases and anticipated market shortages. This may be because days with high inventory turnover rates have a positive relationship with the market value of firms in the engineering sector.

Model 4:

To test the 4th hypotheses given model is analyzed through GMM estimation method and the findings are presented in following table:

\[
\begin{align*}
\Delta TBQ = & \Delta \beta_1 TBQ_{t-1} + \Delta \beta_2 CLT\_C_{t-1} + \Delta \beta_3 FATA_{t-1} + \Delta \beta_4 CATA_{t-1} + \\
& \Delta \beta_5 \ln sales_{t-1} + \Delta \beta_6 de\_ratio_{t-1} + \Delta \beta_7 TDTA_{t-1} + \Delta \beta_8 DPO_{t-1} + \Delta e_t
\end{align*}
\]
Table 6
*Estimation of Relationship of DPO and Firm’s market value*

<table>
<thead>
<tr>
<th>Industry Name</th>
<th>β of DPO</th>
<th>S. Errors</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical</td>
<td>-0.000122</td>
<td>-0.000116</td>
<td>0.7314</td>
</tr>
<tr>
<td>Engineering</td>
<td>0.0000654</td>
<td>-5.20E-05</td>
<td>0.2111</td>
</tr>
<tr>
<td>Textile</td>
<td>0.001063</td>
<td>-0.000324</td>
<td>0.0015</td>
</tr>
<tr>
<td>Cement</td>
<td>0.00000283</td>
<td>-7.81E-06</td>
<td>0.7179</td>
</tr>
<tr>
<td>Fuel and Energy</td>
<td>0.000502</td>
<td>(8.55 E-05)</td>
<td>0</td>
</tr>
<tr>
<td>Sugar</td>
<td>-0.00036</td>
<td>-5.38E-05</td>
<td>0</td>
</tr>
</tbody>
</table>

The results presented in the above table, clearly indicate that in chemical and sugar industries TBQ and DPO relates negatively. Conversely in rest of four said variables are found to have a positive linkage. Moreover, the coefficient of DPO for engineering, chemical & cement industry’s is statistically insignificant.

Negative relationships indicate that the longer the payment period, the higher the market value of the company. This may be due to the fact that the punctual or anticipated payment to the supplier guarantees a regular and regular raw materials supplies. This regular supply of materials ensures that the product is always available to the customer and guarantees that there is no delay in the completion of the order, keeping the operation going. This can help attract potential customers, maintain existing customers and increase sales and profits. Profit growth is considered a good thing for investors and gives more value to companies with higher profits. As a result, the shortening of the payment period has a positive relationship with the market value of the corporation.

However, apart from the sugar and chemical industries, there is a positive linkage between payment terms and TBQ. This is because late payments use more cash from others to make higher profits. However, it is possible if there is no issue of raw-material availability and greater numbers of suppliers are available. Therefore, DPO and TBQ are closely and positively related in these industries.

*Combine Analysis*

After analysing the industry to industry relationship of cash cycle & firm’s value, in the subsequent stage the general linkages of cash cycle, its components & firm’s value is studied and presented in Table 7.
Table 7  
Estimation of the Relationship of CCC, individual components of CCC & Firm’s Market Value

<table>
<thead>
<tr>
<th>Industry Name</th>
<th>β Coefficient</th>
<th>S. Errors</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSO</td>
<td>-0.000598</td>
<td>0.0001791</td>
<td>0.0008</td>
</tr>
<tr>
<td>CCC</td>
<td>-0.000056</td>
<td>0.0000193</td>
<td>0.0033</td>
</tr>
<tr>
<td>DIO</td>
<td>0.000033</td>
<td>0.0000108</td>
<td>0.0017</td>
</tr>
<tr>
<td>DPO</td>
<td>0.000022</td>
<td>0.0000073</td>
<td>0.0023</td>
</tr>
</tbody>
</table>

The aforementioned table displays the over-all affiliation among the dependent variable TBQ and Cash Cycle and its gears i.e. DIO, DSO & DPO individually.

The outcomes disclosed that firm’s market value & CCC and DSO & firms market value relates negatively and significantly. However positive relationship is confirmed between DPO and firm’s value and between DSO and firm’s value.

Conclusion

On the basis of estimation and results it is cleared that the impact of cash conversion cycle on firm’s value varies from one industry to other. The reason of this variation from industry to industry is mainly due to the fact that industries have their own particular and distinct features ranging from its management expertise & skills to technological advancements, that uniquely influence the connection between its cash cycle and value. Result indicates that cash cycle and firm’s value are linked positively for textile industry while rest of the industries showed the negative relationship between the two variables. Furthermore, the findings indicate that cash conversion cycle and day’s sale outstanding are linked positively in cement, fuel & energy and textile industries and rest of three industries showed negative connection between the two. Similarly, the findings confirmed the existence of a negative link between DIO and firm value in textile industry while rest of all show positive connection. Finally, results showed that existence of negative connection in day’s payment outstanding and value of firm in textile, chemical & sugar industries while rest of 3 industries showed opposite relationship.

Lastly, the results of general combined analysis confirmed that firm’s value & cash cycle and DIO and firm’s value are linked negatively with each other. Contrary to this, DPO and firm value both are positively linked with the value of firm. All these relations are found to be significant statistically.
Recommendations

As, results have shown that cash conversion cycle and its component have a significant influence on the value of firm, therefore, it is recommended to the business concerns to manage and control the day’s payment outstanding, day’s sales outstanding, day’s inventory outstanding and cash conversion cycle in order to maximize the value of the firm. Furthermore, business concerns must consider the following points while managing their cash conversion cycle:

- In the expectation of future inflation, businesses must analyze that whether the cost of holding and storing inventory is less than the cost of inflation. It, cost of inflation is higher businesses must buy and store the inventory, not otherwise.
- Businesses must consider and study the credit policy of all the other players in the industry. In order to analyze whether their credit policy is relaxed and tighten as compare to their credit terms and conditions and then manage accordingly.
- Lastly, if availability of raw material is abundant and large number of suppliers are available then supply of raw material will not be affected by delay in the credit payments otherwise it can have adverse effects.

References


COMPARING FORECASTING PERFORMANCE OF LINEAR AND NON-LINEAR TIME SERIES MODELS

Tayyab Raza Fraz¹, Javed Iqbal² and Mudassir Uddin³

Abstract

Time series modelling and the forecasting of economic, financial time series is an active and fascinating area of research due to the presence of structural changes i.e. political regimes, business cycle variations and financial crises etc. In these cases, a careful handling is required to model time series when nonlinearity present in the data. Due to the nonlinear behavior of economic and financial time series, it is not possible to rely only on predictions from the simple estimated linear time series models. This study aims to explore and compare the forecasting performance time series models i.e. linear Autoregressive (AR) model with two nonlinear regime switching models namely Markov Regime Switching Autoregressive (MSAR) and Self-Exciting Threshold Autoregressive (SETAR). Macroeconomic variables i.e. interest rate, inflation (CPI), industrial production, GDP growth, and exchange rate from some developed and developing countries included G7 countries are chosen for this study. Quarterly based time series data from 1970 to 2016 is used. Empirically, the forecast performance of nonlinear time series model namely SETAR is found to be superior to the linear Auto Regressive model as well as nonlinear MSAR model. The results are evaluated on the basis of forecast accuracy criteria namely RMSE, MAE and MAPE.

Keywords: GDP Growth, Markov Regime Switching Autoregressive (MSAR), Self-Exciting Threshold Autoregressive (SETAR). Interest Rate, Inflation (CPI).

JEL Classification: G000

Introduction

Forecasting future path of economies is highly valuable to policy makers, government agencies, business managers, investors, and financial analysts. Many economic models stipulate
expectation of economic variables. For example, the expectation augmented by Phillips curve employs expected future inflation in modeling current inflation. Discounted cash flow model of stock price specifies stock price as a discounted value of expected future dividends. Pricing of derivatives products requires an estimate of expected volatility over the course of its life. As future is uncertain by its very nature, it becomes arduous and challenging for researchers to conjure a satisfactory forecasting model. There is always needed an effort to secure a reliable forecasting model, however, the development continues for the superior fitting and estimating the best forecasting models. A basic cause due to which a forecasting model fails is the ignorance of the characteristics of parametric nonlinearity in economic variables. Andersen and Vahid (1998) shows that the linear forecast models do not have the ability to understand the irregular particulars of the data. Also, these traditional linear estimated models forecast the symmetric pattern of shocks (positive and negative) on the time series variable which is unreliable with the observed asymmetric outcome. An indication of successful forecast of macroeconomic variables is to deal cautiously with the nonlinearity present in the data. The overall environment of economy be determined by some of the main macroeconomic financial time series variables namely exchange rates, industrial production, gross domestic product, interest rate as well as inflation. Better modeling and forecasting techniques of these variables are the ultimately key to success in managing the macro economy. This motivates the ongoing research in macroeconomic forecasting.

The well-known linear models such as the simple autoregressive estimation are usually used to estimate the models for the economic and financial data. The famous linear time series modeling strategy i.e. the traditional Box-Jenkins approach is built on linear autoregressive integrated moving average time series model. These models are used in every field for the purpose of forecasting regardless of the nature of non-linearity inherent in data. As such these linear models may not perform satisfactorily to overcome the issue of nonlinear behavior of time series. Since the past few decades, the researchers show enormous concern in estimation and forecasting the nonlinear time series.

As Terasvirta (2002) points out there exist a large amount of nonlinear models which is impossible to review in a single study. Furthermore, since the last two decades, a good amount of research has focused on nonlinear models to augment the application of widely used linear time series models. Some nonlinear time series models are estimated mostly for the second moment forecast of conditional volatility in the data i.e. Granger and Anderson (1978) estimated the bilinear model, Engle (1982) also estimated the ARCH model while Bollerslev (1986) estimated and present the generalized ARCH (GARCH). According to Franses and Dijk (2000), nonlinear models especially regime-switching models are widely estimated and used to forecast by the researchers. They are also appreciated by many researchers and forecasters. Few years before, Clements and Smith (1997) pointed out that the linear AR model provides better out of sample and in-sample fit as compared to the any other time series model. Similarly, some researchers also studied and revealed that the non-linear time series
models are not a bench-mark for better forecasts against the linear Autoregressive time series models [For details see Diebold (1990), and De Gooijer and Kumar (1992)].

In this study, the main focus was on the forecasting performance of the nonlinear models. Considering two most famous nonlinear time series models namely MSAR and SETAR. Regime switching models are designed especially for modeling the distinct behavior of time series, which generates the data. Regime switching models permit the quick change between regimes but every regime model has a different approach to model the movements between the regimes. The main difference between MSAR models and SETAR models is actually the movement between regimes. In the MS-AR which shows no regard for its past values. While in the SETAR model the movement between regimes is related to the past values. According to Clements and Krolzig (1998), the MS-AR and SETAR models have a higher level of capability of capturing nonlinear behavior of business cycles as compared to linear models. Nevertheless, the power of forecasting of these models is not as superior as expected.

The study uses the macroeconomic data of both developed and developing countries in the analysis. Higher dependence on agriculture, underutilized natural resources, demographic characteristics, socio culture bonds, dualistic nature of economy etc., are the characteristics of developing countries which differentiate them from the developed countries. Thus the structure of macro economy in developing countries is different from the developed countries. Therefore, data of both types of countries are employed.

Quarterly data sets of five most important macroeconomic variables are used which characterize an economy namely interest rate, inflation, GDP growth, exchange rate and industrial production from 1970 to 2016. The developed countries included in analysis are four of the G7 countries Canada, Japan, United Kingdom (UK) and United States (US) and Australia while the developing countries used are the three BRICS countries i.e. Brazil, India, South Africa and Turkey. However, some series have a shorter sample range depending on availability. The parameters of the respective models are estimated and used model selection criteria for the comparison of out-of-sample fit of linear autoregressive AR models, SETAR and MSAR models.

A contribution of this study is to include some important developed countries i.e. the G7 countries and important developing countries i.e. the BRICS countries in the same analysis to evaluate the forecasting performance of linear and nonlinear time series models. Most of the earlier studies have used data from only the developed countries. Keeping in view the distinct structure of the two types of economies it is important to employ the data of both.
Forecasting Models

Linear autoregressive (AR) models

The traditional linear model i.e. AR model is considered only in this study, related to the time-series approach from Box and Jenkins (1970). Kunst (2012) revealed that the linear Autoregressive model is the common linear time series model due to its characteristics i.e. assessing and estimating the model under the assumptions of ordinary least squares regression (OLS). Following these researches, only AR model are used. A process that characterizes the AR model is the autoregressive first order process:

\[ y_t = \mu + \varphi y_{t-1} + \epsilon_t \] ..........................(1)

The intercept parameter is “\( \gamma_t \)” while the uncorrelated random error is presented by \( \mu_t \) having mean zero and variance \( \sigma^2 \). According to Akaike (1973), the order of AR lag q, is selected to minimize AIC, such that:

\[ AIC(q) = \ln(\hat{\sigma}^2(q)) + 2(q + 2)/T \]

Where \( \hat{\sigma}^2 = \sum \hat{\epsilon}_t^2 / (T - 2) \) but only considered the first four order lags. Longer lag orders never gives appropriate and better forecast [Clements and Smith (1997)]. The AR model is a special case of the more general ARMA models.

Self-exciting threshold autoregressive models

TAR model i.e. threshold autoregressive models is the simplest nonlinear threshold model that contains linear specifications separately and regime-switching. These tremendous procedures were firstly introduced by the renowned researcher namely Tong (1978). When \( w_t \) is taken as a lagged value itself, in time series, i.e. \( w_t = y_{t-g} \) for a certain integer \( g > 0 \) then as a result, a new model is established which is SETAR model. According to Kahraman et al. (2012), nonlinear model i.e. SETAR model has always gain attention from the researchers because it contains linear function piecewise without any boundaries with respect to its applications.

If \( g = 1 \) and an autoregressive AR(1) model is assumed, a two regime SETAR model is given by:

\[ y_t = \begin{cases} \alpha_{0.1} + \alpha_{1.1} y_{t-1} + \epsilon_t & \text{if } y_t \leq c, \\ \alpha_{0.2} + \alpha_{1.2} y_{t-1} + \epsilon_t & \text{if } y_t > c, \end{cases} \] ..........................(2)
where $e_t$ are independently and identically distributed white noise sequence conditional upon the time series history $\pi_{t-1}$ where $\pi_{t-1} = \{y_{t-1}, y_{t-2}, \ldots, y_{t-(q-1)}, y_{t-q}\}$, so that, $E[e_t|\pi_{t-1}] = 0$ and $E[e_t^2|\pi_{t-1}] = \sigma^2$

Equation 2 can be written by another way which is:

$$y_t = (a_{0,1} + a_{1,1}y_{t-1})(1 - \beta[y_{t-1} > c]) + (a_{0,2} + a_{1,2}y_{t-1})\beta[y_{t-1} > c] + e_t \hspace{1cm} (3)$$

Where, $\beta[I]$ is actually an indicator function such that if $\beta[I]=1$ if event I occurs while $\beta[I] = 0$ otherwise.

For higher order AR models, for different regimes such as two regime case, the order of AR can be set to q1 and q2 in the lower regime and upper regime respectively. Hence, the SETAR model can be written as:

$$y_t = \begin{cases} a_{0,1} + a_{1,1}y_{t-1} + \cdots + a_{q1,1}y_{t-q1} + e_t & \text{if } y_{t-1} \leq c, \\ a_{0,2} + a_{1,2}y_{t-1} + \cdots + a_{q2,2}y_{t-q2} + e_t & \text{if } y_{t-1} > c, \end{cases} \hspace{1cm} (4)$$

**Markov regime switching models**

According to Terasvirta and Timo (2005), the Markov Regime Switching autoregressive model (MS-AR):

$$y_t = \begin{cases} a_{0,1} + a_{1,1}y_{t-1} + e_t & \text{if } z_t = 1 \\ a_{0,2} + a_{1,2}y_{t-1} + e_t & \text{if } z_t = 2 \end{cases} \hspace{1cm} (5)$$

Hence,

$$y_t = (a_{0,zt} + a_{1,zt}y_{t-1}) + e_t \hspace{1cm} (6)$$

Where $e_t \sim \text{NID}(0, \sigma^2)$. The specification is required for process $z_t$ for the completion of the model.

The famous Markov-Switching model (MSW) was created by Hamilton (1989) which depends on the order of four lags.

$$p(z_t = 1 | z_{t-1} = 1) = w_{11},$$
$$p(z_t = 2 | z_{t-1} = 1) = w_{12},$$
$$p(z_t = 3 | z_{t-1} = 2) = w_{21},$$
$$p(z_t = 4 | z_{t-1} = 2) = w_{22},$$

Hence, $z_t$ is the Markov Process’ first order.
Therefore, \( w_{ij} \) is equal to the probability that a Markov chain moves from state \( i \) at time \( t-1 \) to state \( j \) at time \( t \). i.e. \( w_{11} + w_{12} = 1 \) and \( w_{21} + w_{22} = 1 \). With finite states, an ergodic Markov chain i.e.

\[
P( z_t = 1) = \frac{1-w_{22}}{2-w_{11}+w_{22}} \quad \text{.............................................(7)}
\]

\[
P( z_t = 2) = \frac{1-w_{11}}{2-w_{11}+w_{22}} \quad \text{.............................................(8)}
\]

As pointed out by Deschamps (2008) the difference between the MSAR and the TAR model is that MSAR uses less prior information than the later model. Also the SETAR model requires the choice of a transition variable while the MSAR estimates transition function flexibly from the data.

Hsu, et al. (2010) studied the forecasting ability of traditional ARIMA model and nonlinear SETAR models. They used the data stock prices. According to Hsu, et al. (2010), the economic environment changes from time to time, therefore, the stock market often depends on change over time. They used Chow breakpoint test to choose the breakpoint for the SETAR model according to Hansen (2001). They made their results using the MSE, MAE, AMAPE, and MAPE information criteria’s which strongly favored the SETAR model due to the superior forecasting ability over ARIMA model (Shin, 1992). Furthermore, he also discussed about other famous tests i.e. Phillips and Perron (1988) and ADF by Dickey and Fuller (1979) and (1981). Estimated results from these unit root tests may be biased. Perron (1989) revealed that mostly a unit root in various macroeconomic and financial variables is absent. Hence, to identify the unit root in any time series data set, the unit root breakpoint is used. Akaike criterion (AIC) and Schwarz criterion (BIC) are adopted for the matter of length of lag, two selection methods for Breakpoint test are used, one is F-statistic while the second is Schwarz (BIC) criterion.

**Empirical Findings and Discussion**

**Breakpoint unit root test**

In case of macroeconomic variable GDP growth for all the countries, break point unit root test results revealed that unit root is not present. Nevertheless, results also revealed the unit root is present in remaining macroeconomic time series for most countries i.e. inflation, industrial production, interest rate and exchange rate.

**Table 1**

<table>
<thead>
<tr>
<th>Economic Indicators</th>
<th>Breakpoint Unit Root</th>
<th>Australia</th>
<th>Brazil</th>
<th>Canada</th>
<th>India</th>
<th>Japan</th>
<th>South Africa</th>
<th>Turkey</th>
<th>UK</th>
<th>USA</th>
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(Table Continued......)
Forecast Evaluation

Table 2a and Table 2b, represent the results regarding the forecasting performance of macroeconomic variables for all the models for short term i.e. 4 quarters ahead and long term i.e. 21 quarters ahead respectively but the results do not favor a particular forecasting model. Moreover, multi-criteria (RMSE, MAE, and MAPE) are used for the comparison of forecasting ability between the models for short term and long term. The model with best forecasting performance corresponding to the linear or nonlinear model has been shown. The results are shown by each macroeconomic time series. Generally, for short-run forecasting as well as long run forecasting, SETAR model produce the lowest forecast accuracy measure in most of the cases.

Table 2a
**RMSE, MAP & MAPE for one year (4-Quarters) ahead forecast**

<table>
<thead>
<tr>
<th>Country</th>
<th>Exchange rate</th>
<th>GDP growth</th>
<th>Log(CPI)</th>
<th>Interest Rate</th>
<th>Log (Industrial Production)</th>
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</thead>
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<td>AR SET AR</td>
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<tr>
<td>Australia</td>
<td>0.07 0.025 0.95</td>
<td>0.32 0.376 0.37</td>
<td>0.0 0.003 0.00</td>
<td>1.02 0.217 1.13</td>
<td>0.01 0.034 0.01</td>
</tr>
<tr>
<td>Brazil</td>
<td>0.71 0.782 0.68</td>
<td>2.01 2.178 1.93</td>
<td>0.0 0.019 0.07</td>
<td>0.25 0.033 0.16</td>
<td>0.08 0.117 0.68</td>
</tr>
<tr>
<td>Canada</td>
<td>0.05 0.072 0.05</td>
<td>0.34 0.247 0.29</td>
<td>0.0 0.003 0.03</td>
<td>0.73 0.209 3.01</td>
<td>0.00 0.003 0.21</td>
</tr>
<tr>
<td>India</td>
<td>0.05 0.050 0.03</td>
<td>0.33 0.304 0.27</td>
<td>0.0 0.009 0.01</td>
<td>0.60 0.507 0.61</td>
<td>0.01 0.032 0.09</td>
</tr>
<tr>
<td>Japan</td>
<td>0.04 0.025 0.05</td>
<td>0.77 0.600 0.74</td>
<td>0.0 0.006 0.00</td>
<td>0.01 0.062 0.14</td>
<td>0.02 0.041 0.02</td>
</tr>
<tr>
<td>South Africa</td>
<td>2.32 4.028 3.49</td>
<td>0.85 0.984 0.95</td>
<td>0.0 0.020 0.00</td>
<td>0.22 0.224 0.23</td>
<td>0.01 0.007 0.01</td>
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</table>

*(Table Continued.....)*
Table 2b
RMSE, MAP & MAPE for 5 year (21-Quarters) ahead forecast

<table>
<thead>
<tr>
<th>Country</th>
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<th>MAP</th>
<th>MAPE</th>
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</thead>
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<td>0.38</td>
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<tr>
<td>UK</td>
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<td>0.02</td>
<td>0.03</td>
</tr>
<tr>
<td>USA</td>
<td>-</td>
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</tr>
<tr>
<td>Australia</td>
<td>0.05</td>
<td>0.05</td>
<td>0.05</td>
</tr>
<tr>
<td>Brazil</td>
<td>0.63</td>
<td>0.68</td>
<td>0.60</td>
</tr>
<tr>
<td>Canada</td>
<td>0.05</td>
<td>0.06</td>
<td>0.05</td>
</tr>
<tr>
<td>India</td>
<td>0.05</td>
<td>0.04</td>
<td>0.03</td>
</tr>
<tr>
<td>Japan</td>
<td>0.03</td>
<td>0.04</td>
<td>0.04</td>
</tr>
<tr>
<td>South Africa</td>
<td>1.88</td>
<td>3.44</td>
<td>2.96</td>
</tr>
<tr>
<td>Turkey</td>
<td>0.35</td>
<td>0.07</td>
<td>0.36</td>
</tr>
<tr>
<td>UK</td>
<td>0.01</td>
<td>0.02</td>
<td>0.02</td>
</tr>
<tr>
<td>USA</td>
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<td>USA</td>
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(Table Continued....)
NOTE: Forecast evaluation criteria techniques MAE, MAPE and RMSE are used.

<table>
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<td>0.0 0.297 0.313</td>
<td>0.0 0.707 0.704</td>
<td>0.0 0.070 0.070</td>
<td>0.0 0.149 0.150</td>
<td>0.0 0.149 0.150</td>
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<td>0.0 0.067 0.133</td>
<td>0.0 0.143 0.326</td>
<td>0.0 0.053 0.034</td>
<td>0.0 0.143 0.326</td>
<td>0.0 0.053 0.034</td>
<td>0.0 0.143 0.326</td>
</tr>
<tr>
<td>Canada</td>
<td>0.0 0.077 0.075</td>
<td>0.0 0.400 0.399</td>
<td>0.0 0.069 0.003</td>
<td>0.0 0.132 0.250</td>
<td>0.0 0.016 0.030</td>
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<td>0.2 0.277 0.242</td>
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<td>294 120 254</td>
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<td>110 364 1888</td>
<td>1.6 1.186 1.11</td>
<td>262 238 268</td>
<td>1.2 0.258 0.37</td>
<td>110 364 1888</td>
</tr>
</tbody>
</table>
Exchange rate

The comparison of forecasting performance for short-run forecasting of the exchange rate is presented in Table 2a, while for long run forecasting comparison, the results are shown in Table 2b. Most of the results are in favor of nonlinear models for short-run forecasting. As the SETAR and MS-AR contains the lowest forecasting errors in five out of nine countries for the exchange rate, in which SETAR models technique have better prediction ability performance for exchange rate of Australia, Japan, and Turkey with the lowest forecasting errors. The MS-AR modeling technique is much better for developing countries such as India and Brazil as compared to the SETAR and Linear AR models. But linear AR models is also a suitable technique for the forecasting purpose for developed countries such as Canada and the UK, while it is also a better forecasting technique for South Africa which is a developing country.

For the long run forecasting, the linear AR modeling technique is a better choice for the two developed countries e.g. Canada and the UK. While the SETAR modeling technique has the best forecasting performance as compared to the AR and MS-AR models for Australia and two developing countries Brazil and South Africa. MS-AR modeling technique has the lowest forecasting error for exchange rates of India and Japan (Table 2b).

GDP growth

The Comparison of forecasting techniques for the short-run horizons also takes account for the Gross domestic product of countries, displayed in Table 2a. The best forecasting technique for the GDP growth of Brazil, India, Turkey and the UK is MS-AR technique, using the multi-comparison criteria. Furthermore, SETAR is the best forecasting model for the most developed countries named Canada and Japan. Linear AR modeling technique is better among SETAR and MS-AR for GDP growth of Australia, USA, and South Africa. For long run forecasting (Table 2b), linear AR models are superior for GDP growth of Canada, India, UK and Turkey. SETAR modeling technique is best for South Africa and the USA while the MS-AR modeling technique is far better than linear AR and SETAR for GDP growth of Australia, Brazil, and Japan.

Consumer Price Inflation

The CPI is a measure that studies the average of prices of a consumer goods and services. It is one of the most important macroeconomic variables for any country. The performance for the short-run forecasting for CPI totally supports the nonlinear regime models. The SETAR modeling technique is the best one among all the other forecasting techniques for the CPI for Australia, Brazil, Canada, India, and the USA. While the MS-AR technique is the most suitable and better forecasting modeling technique for Japan, UK, South Africa and Turkey. All the information criteria fully
Interest rate

According to the results shown in Table 2a, for short-run forecasting prospect, the SETAR modeling technique is the most superior among the MS-AR and linear AR model for the interest rate of all countries except Japan. For long run forecasting prospect, again SETAR is the most powerful forecasting technique for Brazil, Canada, India, turkey and the USA while the MS-AR is not suitable for the interest rate time series. All in all, the SETAR modeling techniques is the most suitable forecasting technique for the interest rate.

Industrial production

Industrial or manufacturing production is the backbone of the economy of any country. The results can be seen above for the purpose of short-run forecasting comparison. MS-AR modeling technique has the lowest forecasting error for Industrial production of Australia, Japan, and the UK while SETAR model is a suitable forecasting technique for industrial production of Canada and South Africa. The linear AR model is best among nonlinear models for the remaining four countries. According to our results, the long run forecasting outcome is the most surprising result. As the linear AR modeling technique has the superior forecasting ability for most of the countries except Australia, Canada and USA in which the SETAR and MS-AR are better forecasting techniques.

Conclusion

In this research paper, the forecast performance of two famous regime models namely Self-exciting threshold SETAR models and Markov regime switching autoregressive MSAR models is evaluated viz-a-viz the linear AR model using the data of some important macroeconomic variables namely exchange rate, consumer price inflation, gross domestic product growth, interest rate and industrial production. Quarterly data from 1960 to 2016 are employed from some important developed countries including the G7 countries and some important developing countries including the BRICS countries. The literature has presented conflicting results regarding this comparison. It is found that both the SETAR and MSAR models are empirically more powerful than the linear AR model using the three forecast evaluation criteria by means of shocks and particular characteristics. One of the main reason regarding the inability of the less satisfactory performance of the linear AR models that these generally fail to capture the stylized behavior some economic time series i.e. structural breaks and asymmetries in business cycle recessions and expansions.
In some cases, especially with industrial production, there is evidence suggesting that the forecasting power of nonlinear regime models is not much superior to linear model. In the short-run, the forecasting performance of SETAR model is better than MSAR model for the exchange rate and inflation of different countries. For interest rate variable the forecasting power of SETAR model is superior for all the developed and developing countries.

The MSAR model gives more accurate forecast for GDP growth for most of the countries. However, there is not much difference in the forecasting ability of the MSAR model for exchange rate and inflation. Empirically, the forecasting power of linear AR model is found to be better than nonlinear models in few cases of the exchange rate, GDP growth and industrial production especially for developing countries thus supporting the De-Gooijer and Kumar (1992) conclusion who also found superiority of linear mode’s forecast in some cases. For the long run, the forecast performance of the SETAR model is superior to the MSAR and linear AR models for the exchange rate and interest rate and inflation for most of the countries. Overall, it is found that the nonlinear models namely the SETAR and MSAR yield better forecasts. It is also found that the forecasting performance of SETAR model is superior to the MSAR and linear AR models for both the short run and long run forecasting horizons for all the macroeconomic time series related to the developed and developing countries. Thus when nonlinearity and structural changes are present in the time series data, the linear models do not perform satisfactory as compared to the nonlinear models.

References


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